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Water sustainability disclosure in the integrated reports of JSE listed companies in South Africa

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DECLARATION

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ABSTRACT

South Africa is in a crisis relating to the quality of available water. South Africa is a country that is considered as one of the top 30 driest countries in the world and this is principally based on climate conditions, as well as an escalation of water demands. The primary users of water are companies; therefore, companies must have measures in place to protect this scarce resource. This study examined the extent of the interventions by selected Johannesburg Stock Exchange (JSE) listed South African companies in relation to water sustainability disclosures. An assessment of whether the importance of water is recognised and a commitment to alleviate water shortage, as shown by JSE listed companies, was performed. Integrated reports were analysed according to the Disclosure Assessment and Performance Tool. The population was grouped according to four water-intensive sectors: The construction sector, the food production sector, the mining sector and the oil and gas sector. The total population of JSE listed South African companies for all four sectors is 62 companies for this study. The data in these reports was selected and evaluated in accordance with a set of questions reflected under three categories in the Disclosure Assessment and Performance tool. The companies were rated according to a rating scheme from D to A for each question. The categories are linked to each of the three research questions pertinent to this study. It was established, through the content analysis of the integrated reports, that the companies grasp the seriousness of the water crisis that South Africa is experiencing and are making an effort to reduce the water risk; however, various areas require improvement. These areas include the lack of integration between water sustainability information and their financial reports, setting of performance standards and goals in terms of wastewater discharge and a major concern that affected the majority of companies in all four sectors was their engagement with their respective suppliers in the supply chain process. Based on the findings of all four sectors it was revealed that the industrial metal and mining sector was the best overall performing sector in the study; however, this sector, together with other sectors, has also struggled in its performance in a few areas. Increased pressure now needs to be placed on these JSE listed companies to ensure continuous improvement in their performance relating to water sustainability. This, in turn, will result in a reduction of environmental issues, which include water scarcity, faced in South Africa and across the globe.

Contents

LIST OF ABBREVIATIONS

ANC:	African National Congress
AMD:	Acid mine drainage
CDP:	Carbon disclosure project
CRD:	Corporate reporting dialogue
DWFI:	Daugherty Water for Food Global Institute
ESG:	Environmental, social and governance
GRI:	Global reporting initiative
IASB:	International Accounting Standards Board
IFRS:	International Financial Reporting Standards
IIRC:	International Integrated Reporting Council
JSE:	Johannesburg Stock Exchange
NGO:	Non-governmental organisation
UN:	United Nations
WETT:	Water efficiency target tool

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Chapter 1

Overview of the study

1.1 INTRODUCTION AND BACKGROUND OF THE STUDY

The entire world is in crisis relating to the quality of available water. South Africa is one of the water-scarce countries, which is principally caused by climatic conditions, as well as an escalation of water demands. This situation is getting worse due to localised population growth resulting in gross imbalances between water supply and demand (Helen Suzman Foundation, 2020). Water scarcity has already affected every continent on the planet; currently, over one billion people have no access to clean drinking water and approximately 2.5 billion people have inadequate sanitation facilities (Sánchez-Hernández, Robina-Ramírez, & De Clercq, 2017). Water usage has more than doubled in the last century and many more regions are recording extreme water shortages (Sánchez-Hernández et al., 2017).

It is expected that water scarcity will escalate due to climate change. Predictions are that temperatures across the globe will increase. The frequency and severity of droughts have heavily impacted agricultural production and the increase in temperature has resulted in a higher demand for crop water across the world. Action needs to be taken to improve wastewater safety and to re-use fresh water. While droughts cannot be prevented, appropriate actions to mitigate water shortage will prevent socioeconomic disruption and famine (Weforum, 2019).

Adverse effects on human health are recognised to be a result of the impact that climate change has on water resources (Abedin, Collins, Habiba, & Shaw, 2018). Not only is it a current problem that there is limited access to water supplies for drinking and farming, but this will get worse due to the ever-growing population. The effect that climate change has on food security and water has had the greatest impact on human health amongst developing countries (Abedin et al., 2018). This matter is further emphasised in a report by the World Bank, which states that the combined effect of an increase in population, rising incomes, as well as the expansion of cities will result in water demands increasing immensely, whilst supply will remain uncertain and erratic (World Bank, 2016).

During 2018, Cape Town, one of the biggest cities in South Africa, was affected by the worst water crisis ever experienced, which was branded as the day zero scenario (Botha, 2015). This day zero resulted in Cape Town's four million inhabitants queueing at 200 strand pipes for their allowance of 25 litres of water per day. The city has, however, enforced stricter waste control measures, which include the prosecution of homeowners who use more than their limit of 87 litres of water per day (The Guardian, 2018).

During the post-apartheid period, issues relating to the management of resources have become extremely political (Odi, 2018). The country has been dominated by racial segregation since 1652, when the Europeans first arrived at the Cape. This segregation was further intensified under the apartheid regime (Gradín, 2018). Subsequent to the dawn of the constitutional era, the National Water Act (NWA), which was developed in South Africa and passed in 1998, was created with the primary aim of restructuring the laws in terms of water and has been extensively recognised as one of the most comprehensive water laws ever created (Viljoen & van der Walt, 2018). Prior to the water act being passed, 40% of the population had no access to clean water, therefore, the National Water Act of 1998 was seen as an essential element to resolve the inequalities of the apartheid era (Plessis, 2011). Conflict could also be seen between the national government, being the ANC and a provincial government, the Democratic Alliance, whereby the national government rejected calls by the provincial government to improve water infrastructure, as well as re-balance resource allocation between agricultural and consumption purposes (Odi, 2018).

In October 2019, the groundwater division, a division of the geological society of South Africa, held its 16th groundwater conference and exhibition in Port Elizabeth, South Africa. The theme of the conference was "Water demand versus Water Availability and Use – the Key Challenge" Previous conferences had placed focus on groundwater, new technologies and networking (GWD, 2019). This conference was slightly different; focus was placed on water usage and conservation with an emphasis on groundwater. Conservation has become a keyword where water scarcity is experienced. Cities such as Cape Town had to impose water restrictions, as well as create an awareness of the need to use less water. It is expected that people will increase their efforts to save water and place less reliance on the limited reserves. Making a prediction of a population to conserve water would be quite useful, however, it is extremely difficult (Searle & Harper, 2020).

In April 2019, the Daugherty Water for Food Global Institute (DWFI) at the University of Nebraska in the United States hosted the 2019 Water for Food Global Conference. They explored cutting-edge work to resolve global issues currently being faced. They are working to ensure that the globe has sufficient water and food to support approximately 10 billion individuals during the next 30 years. The topic that was discussed by leading experts and organisations was "Water for a Hungry World: Innovation in Water and Food Security" – their focus was future generations of policy development, smart technology and research (Global Water Partnership, 2019).

Traditional financial reporting is being supplemented with non-financial information in order to improve the available information for stakeholders to make appropriate decisions. These reports include sustainability reports and corporate social responsibility reports. However, the level of non-financial information in these reports has been overwhelming in quantity and without the facilitation of stakeholder understanding (Cheng, 2014). Dumitrua & Guşe (2017) mention that financial reporting considers only historical information, while non-financial reporting extends the accountability beyond this traditional role and assumes that companies have greater responsibilities than just maximising shareholders' wealth.

In 2010, a solution to this problem was proposed by the new International Integrated Reporting Council (IIRC) that a link between financial and non-financial information should be provided by companies for future performance to be assessed (International Integrated Reporting Council, 2013). A way of achieving this objective is through the adoption of the integrated report, which promises to be responsive, strategic, holistic and relevant throughout future years (Dumitrua & Guşe, 2017).

Hans Hoogervorst, the International Accounting Standards Board (IASB) chairperson stated in his speech in April 2017 that the trustees of the International Financial Reporting standards (IFRS) foundation made mention that they are liaising with the International Integrated Reporting Council and Corporate Reporting dialogue. Further studies are undertaken to establish the future role of the IASB in terms of the wider landscape of corporate reporting. The IASB has admitted to being aware that there are limitations in the current financial reporting system (IFRS, 2017).

In terms of the conceptual framework for financial reporting, the IASB acknowledges that current reporting does not portray a company's value, therefore, further information needs to

be provided in order to determine their value. Information that users require concerns economic developments in which the company operates, external environment as well as competition that the company is faced with (IFRS, 2017). This information is more forward-looking and often included in integrated reporting.

Integrated reporting, therefore, forms part of the objectives of accounting in that it provides forward-looking data that aid in the decision-making process of investors and other relevant stakeholders. It is aimed at providers of capital to report on value creation over time through interaction with the external and internal environment (Herbert & Graham, 2019). Integrated reporting is deemed to be an ideal governance mechanism to monitor the performance of organisations, especially since South Africa is making constructive attempts to eradicate corruption and inequalities, which have continued in the post-apartheid era (Haji & Anifowose, 2016).

In 2017, the Carbon Disclosure Project created a water information request to be completed by companies. This request was backed by 639 investors with over R1040 trillion in assets. Investors request this information from companies to increase their confidence that the company is aware of the water risks being faced by them, as well as whether they are putting measures in place to curb these risks (CDP, 2017). Investors view global challenges relating to sustainability as material to the long-term financial performance of the company as these challenges are becoming known as time progresses, such as water scarcity and climate changes. Companies are asked to disclose these types of risks in their integrated reports in order to inform investors and other stakeholders (Kouloukoui et al., 2019). Investors are taking into account environmental, social and governance (ESG) factors; this is also known as sustainable investing. The way in which investors use traditional financial data to evaluate the performance of a business, so too do they use ESG data to evaluate their investment in the context of sustainability (Pinchot & Christianson, 2019)

1.2 RESEARCH PROBLEM STATEMENT

Viljoen & van der Walt (2018) argue that over 650 million people have no clean water access around the globe, whilst the demand for water is increasing. They estimate that the world will have a shortfall of 40 percent by 2030. The reality in South Africa is no different, as South Africa is plagued with drought conditions and water conservation is poor. South Africa is

regarded as a water-scarce nation and by 2030 South Africa will be facing a 17% water deficit, which will get worse as a result of climate change (WWF, 2017).

The current situation in terms of water scarcity in South Africa is exacerbated by the fact that freshwater resources are unevenly distributed and disproportionally available when compared to the amounts required (Fisher-Jeffes, Armitage, & Carden, 2017). Pollution and water depletion through industrialisation and urbanisation are global issues that can have an immense effect on the sustainable development of human society (Zeng, Zhang, Zhou, Zhao, & Chen, 2019). Untreated water contains many types of bacteria and viruses, which can lead to many deadly diseases affecting large portions of the population of a particular country (WWF, 2018).

There is no surplus water available in South Africa, therefore, future development could be halted. New technologies such as advanced water meter systems, which can be attached to taps, can significantly improve the management and understanding of water systems (WWF, 2015). As a result of these water risks, improved disclosure and transparency need to be provided by companies with regards to their water management. Companies need to grasp the seriousness of this water crisis and the impact it may have on future business and society. They need to identify and measure their water risks adequately, as well as put measures in place to increase their efficiency relating to water. Companies have the ability to drive this change more quickly and in this way, our water resources will be protected.

1.3 RESEARCH AIM AND OBJECTIVES

1.3.1 Research aim

The aim of the study is to examine and compare the extent of water sustainability disclosures in the annual integrated reports of JSE listed companies in South Africa and to evaluate the quality of such disclosures.

1.3.2 Research objectives

1. To examine the practice of water sustainability disclosures in the annual integrated reports of JSE listed companies in South Africa.

2. To examine the levels of management involvement of water sustainability disclosures in the annual integrated reports of JSE listed companies in South Africa.

3. To investigate the management process and performance measurement systems for the reporting of water sustainability disclosures in the annual integrated reports of JSE listed companies in South Africa.

1.4 RESEARCH QUESTIONS

Research question one

What is the practice of water sustainability disclosures in the annual integrated reports of JSE listed companies in South Africa?

Research question two

What are the levels of management involvement of water sustainability disclosures in the annual integrated reports of JSE listed companies in South Africa?

Research question three

What is the management process and performance measurement systems for the reporting of water sustainability disclosures in the annual integrated reports of JSE listed companies in South Africa?

1.5 SIGNIFICANCE OF THE STUDY

A water crisis is currently being faced by South Africa. Companies, therefore, need to become more accountable for their usage and management of water and other types of natural capital. Analysing their water sustainability disclosure will give an indication of the level of senior personnel involvement and how efficiently they are utilising water and managing their water sustainability risks in accordance with their performance standards and goals. Gaps will be identified in the disclosures made by companies relating to water risks and recommendations will be provided for companies to make improvements in their water disclosures, as well as measurement and management of water sustainability risks.

1.6 DELIMITATIONS OF THE STUDY

There are limitations such as being unable to obtain the integrated reports. Links to the integrated reports might not be working. The focus of the integrated report is limited to the

aspect of water sustainability whilst other important aspects of the integrated report will not be taken into consideration as part of this study.

The sample of companies chosen was limited to only four industry sectors of South African JSE listed companies; therefore, other sector companies will not be taken into consideration in this study. The reason for only choosing these four sectors is that they are regarded as water-intensive sectors, which will provide adequate disclosures on water sustainability. Extension to non-water-intensive sectors will not provide any value to this study as detailed water sustainability disclosure will inherently not be provided.

1.7 SUMMARY OF CHAPTERS

Chapter 1: This chapter includes the introduction and background of the study and indicates why this study was undertaken. The research problem, aims and objectives, research questions, significance of the study, as well as the delimitations of the study are discussed.

Chapter 2: This chapter includes a literature review on integrated reporting and water risks being faced by South Africa. Further to this, a review of similar studies relating to water disclosures is performed. The theoretical and conceptual literature review that includes the conceptual framework, integrated reporting framework and various other reporting frameworks relevant to this study are discussed. Finally, accounting theories relating to this study are discussed.

Chapter 3: This chapter discusses the research methodology used in this study. This includes the research design, research population, sample size, data collection methods, data analysis, validity and reliability and finally, ethical consideration will be discussed.

Chapter 4: This chapter presents the research results and detailed findings of the researcher. A Disclosure Assessment and Performance Tool is used, which includes three categories in order to analyse the integrated reports of the JSE listed companies. Further discussions to substantiate the company scores given for each question were performed and the finding per category is provided thereafter.

Chapter 5: This chapter will provide the conclusions on the findings, as well as the recommendations and areas for future research.

1.8 CONCLUSION

An evaluation of whether companies listed on the JSE recognise the importance of water and are committed to determining the water sustainability needs. Companies need to realise the importance of adequate disclosures on their integrated reports and the impact it will have on their future sustainability. A deeper consideration must be given to the water scarcity risks that can impact the success of the respective companies, as well as the viability of future societies. This study examined and compared the extent of water sustainability disclosures in these companies' integrated reports and evaluated the quality of such disclosures. The next chapter provides a discussion of the empirical and theoretical literature reviews.

Chapter 2
Literature review

2.1 INTRODUCTION

This chapter starts with a brief and historic overview of the current water crisis being faced by South Africa and the rest of the world. The chapter further discusses integrated reporting and explores the recent literature on the topics of integrated reporting together with sustainability. Thereafter, water scarcity is discussed together with prior research. Finally, the applicable conceptual and theoretical frameworks are discussed.

2.2 EMPIRICAL LITERATURE REVIEW

2.2.1 Brief historic overview

The planet is presently on the brim of an impending catastrophe that has arisen from the aftershock of environmental degradation and increased population growth (Vorster & Marais, 2014). Society and business place extreme reliance on water, which is a natural resource. The increase in the demand for water has resulted in additional pressure to ensure equal distribution of this scarce natural resource. Climate change, as well as wastewater management, have negatively impacted the usage of available water. Climate change can be seen as one of humanity's greatest challenges of recent times (Kouloukoui et al., 2019). This, therefore, results in businesses having to compete with minimal water usage and further stringent regulations relating to water (Askham & Van der Poll, 2017).

Since the 1970s, there have been high levels of economic, as well as demographic growth. The resources of the world would, therefore, need to be sub-divided further to cater for this growth (Meadows, 1974). The world's population has increased to unmanageable levels and there was already an extreme unequal distribution of resources. Meadows (1974) mentions that the population would double in 30 years' time and that civilisation would struggle to maintain the needs of the current population at that time. However, the only way to meet those needs would be to exploit the environment, thereby causing harm to the planet.

The first Earth Summit in Brazil, planned by the United Nations (UN), was held in Brazil in 1992 and in 2012 they met again in Brazil, but this time the summit included many private businesses, which had the same vision in mind (The Guardian, 2012). However, in the discussions on the issue of environmental impact in the last 40 years, there have been major criticisms and there have been very few improvements on the exploitation of the environment and water usage. Almost 2.5 billion people have limited access to clean water and sanitation. The World Economic Forum's Global Risk Report has classified the shortage of water as the third greatest danger currently facing the world (Ben-Amar & Chelli, 2018).

The sustainability concept was first established in 1987 by the World Commission on Environment and Development, which made a change to the attitude of the world and become one of the most dominant principles (Atapattu, 2019). Companies began including environmental and social issues in their reporting system during the period 1981-1990. This was when the accounting profession realised the need to account for these issues. Focus turned more to what kind of environmental information companies were required to disclose. Very few reporting standards existed during that period (Moid, 2017).

1997 brought about the Global Reporting Initiative (GRI), which was the first global standards for sustainability reporting. The GRI assists governments and organisations to comprehend and communicate the effect of business on sustainability issues (GRI, 2019).

From the above, it can be concluded that the environmental issues, which include water shortages, have not arisen recently and that many companies have developed methods to assist their operations to manage water risks. This study will ascertain whether South African JSE listed companies are disclosing aspects of water sustainability. The level of management involved in water sustainability disclosure and the management process and performance management systems for the reporting of water sustainability disclosures.

2.2.2 Integrated reporting

Integrated reporting in South Africa commenced through the Integrated Reporting Council of SA and King IV (IRCSA, 2018). The primary purpose of an integrated report was to explain to providers of financial capital how an organisation creates value over time (International Integrated Reporting Council, 2013). Judge Mervin King headed the adoption of integrated

reporting in South Africa (Eccles & Saltzman, 2011). Integrated reporting was established by the International Integrated Reporting Council, which is a global alliance of regulators, companies, investors, standards setters, the accounting profession, academia and NGOs. The alliance promotes communication about the creation of value as the future of corporate reporting (Dumitrua & Guse, 2017). The International Integrated reporting framework was developed for the purpose of value creation.

The integrated reporting framework incorporates a principle-based approach with the intention to strike a balance between prescription and flexibility. This allows for the recognition of a wide variation of circumstances of organisations, whilst also allowing for a degree of comparability amongst companies. Specific key performance indicators or measurement methods are not provided in the framework, however, there does need to be a certain number of requirements that need to be met for the document to be recognised as an integrated report as per the reporting framework (International Integrated Reporting Council, 2013). The main concern relating to the integrated reporting framework is that the framework is mainly focused on investors, with minimal focus on sustainability or accountability (Milne & Gray, 2012). Furthermore, the actual implementation of the framework is a concern due to the lack of enforcement by the regulators (Flower, 2015). Therefore, those responsible for the preparation of the integrated report need to exercise their judgement, given the specific circumstances of the organisation.

There are two elements in the international integrated reporting (IIR) framework, namely the content elements and guiding principles, which refer to the presentation and data that should be contained in the integrated report (International Integrated Reporting Council, 2013). Although the framework makes no direct mention of sustainability, the integrated reporting council released the Corporate Reporting Dialogue in 2015 to assist organisations in the application of the requirements of the various reporting initiatives (Herbert & Graham, 2019). There is hope that integrated reporting will stimulate a longer-term emphasis among investors and managers, replacing short-termism, which has many a time been criticised for the problems of capitalism (de Villiers, Venter, & Hsiao, 2017). In integrated reporting, companies need to embrace a new reporting culture that is inclusive of all the activities of the business in which resources have been utilised (Cheng, 2014).

In 2010, the Johannesburg Stock Exchange (JSE) became the first exchange in the world to require companies listed on the JSE to provide integrated reports. This preparation was

expedited through the adoption of the King IV Code (IRCSA, 2018). Furthermore, the King IV Code requires that companies not only report on their financial statements but also provide communication with respect to integrated reporting and sustainability (Esterhuyse & Wingard, 2016). In terms of preparing the integrated report, the seven Guiding Principles need to be considered to determine the extent of disclosure relating to the King IV Code. These include strategic focus and future orientation, connectivity of information, stakeholder relationships, materiality, conciseness, reliability and completeness, consistency and comparability (IRCSA, 2018). The environmental and political challenges faced by South Africa have enabled it to lead the integrated reporting and stakeholder-oriented corporate governance approach to financial reporting. Therefore, since South African listed companies have been submitting integrated reports, these readily available integrated reports will be used to examine and compare the extent of water sustainability disclosures in the annual integrated reports of JSE listed companies in South Africa and to evaluate the quality of such disclosures.

The structure of the integrated report should improve the usefulness of financial and non-financial information to all stakeholders. Companies have observed that incorporating sustainability with operational, strategic and financial reporting, has delivered detailed information concerning their inclusive performance, therefore, adding value in the long term (Ayoola & Olasanmi, 2013). Nilsson (2016) explains that it should bring a higher level of coherence and efficiency to reporting and assist organisations to develop integrated thinking. Similarly, Roth (2014) emphasised that integrated thinking will become valuable in evaluating the sustainability of companies. A further benefit of integrated reporting that was mentioned by Roth was that an integrated report highlights its relevance to financial factors and makes information available to analysts. However, Stacchezzini, Melloni, & Lai (2016) advise that integrated reporting should not be used as a mechanism for reforming the public image on the behaviour of organisations. Maniora (2017) adds that companies gain no benefit from changing from separate ESG reporting to integrated reporting.

The survey performed in 2017 by KPMG, a global network of professional firms providing audit, tax and advisory services, shows South Africa as one of the leading countries in terms of corporate responsibility reporting. However, if this survey is compared to the KPMG survey performed in 2015, it can be seen that there has been a decline in corporate reporting from 95% in 2015 to 92% in 2017. Even though there was a decline, South Africa is still ahead of many other well-developed countries of the world (KPMG, 2017). South African companies are seen

to be leading the way in terms of corporate responsibility reporting; however, the focus of this study will be the extent of water sustainability disclosures as part of this corporate responsibility reporting.

Previous studies indicate that authors are critical of the substance and scope of the current integrated reporting system and are concerned that it is undergoing similar problems related to the previous reporting systems, particularly with regards to the emphasis on creating value for investors (Milne & Gray, 2012). There has been an increase in sustainability reporting disclosures since the adoption of integrated reports, however, these reports have included mostly rhetorical disclosures, which focus on positive factors and exclude the negative (Solomon & Maroun, 2012). Further to this, organisations provide limited disclosures in relation to the creation of value, which defeats the primary purpose of implementing integrated reporting, which is value creation. Integrated reports performed by companies are often utilised as legitimacy tools and became ceremonial in nature, instead of being robust and accountable mechanisms for the benefit of all stakeholders concerned (Haji & Anifowose, 2016).

Stacchezzini, Melloni & Lai (2016) assessed integrated reports for the 2014 financial year of those companies that publish their reports on the International Integrated Reporting Council website. The sample size was 54 firms that belong to 10 industry sectors. Their findings were that environmentally sensitive industries disclosed greater amounts of environmental information as part of their integrated reporting, which was mainly due to external stakeholder pressures being experienced, compared to other industries. Similarly, Solomon & Maroun (2012) performed a study on ten JSE listed companies over a three-year period. Their findings show great improvement in all three disclosures of social, environmental and ethical factors. However, the authors identified the amount of repetition included in the reports as a weakness. Carels, Maroun, & Padia (2013) covered a wider area of testing from 2008 to 2012, focusing on integrated reporting in the South African mining sector. Their findings differed slightly from Solomon & Maroun (2012) as they found that ethical disclosures remained constant throughout the period; however, social and environmental disclosures have improved significantly over the period of study. Managers use their discretion in terms of which information to disclose, thereby altering the perception of their sustainability achievements because the companies attempt to increase their corporate legitimacy

Haji & Anifowose (2016) studied sustainability disclosures of 82 South African companies. The period of study was 2011-2013 financial years and included six large industries. Their findings revealed a significant increase in sustainability disclosures following the adoption of integrated reporting. Human capital and intellectual capital disclosures increased gradually. Similarly, Herbert & Graham (2019) revealed a substantial increase in sustainability reporting together with progress in terms of following the guidelines as per the integrated reporting framework.

Overall, in terms of integrated reporting, studies performed in the past have shown a significant improvement in sustainability disclosure since the adoption of integrated reporting in 2011. However, external pressures and corporate legitimacy have played a role in the level of specific disclosures provided by companies. Managers are using their discretion in terms of which information to disclose, thereby altering the perception of their sustainability achievements in order to achieve legitimacy in society.

2.2.3 Water risks

South Africa is regarded as one of the top 30 water dry countries in the world (Sánchez-Hernández et al., 2017). Unless current reserves and usage is managed adequately, South Africa could face a situation of extreme water scarcity. Low annual rainfall has further exacerbated the situation.

The population of the world has enough fresh water, however, too much water is wasted, managed unsustainably or polluted. Great quantities of water are being extracted from below the surface to produce food, however, the wastage level is at an all-time high (Von Borman & Gulati, 2014). Water quality issues and failing infrastructure have added additional strain to the existing water situation and resulted in excessive wastage (Askham & Van der Poll, 2017).

Almost all the available water in South Africa has been allocated, whilst less than 1.2% of all the water on earth is available for human use (CDP, 2018). Climate change, failing water infrastructure, changes in consumption patterns, as well as demographic pressures have further intensified this situation, resulting in financial implications in certain regions up to 6% of their GDP by 2050, increasing emigration and igniting conflict (World Bank, 2016). Unless quick action is taken, areas where there is an abundant amount of water will soon be experiencing water shortages. These areas include East Asia and Central Africa. Areas, such as the Middle

East, where there is a current short supply of water, will soon worsen even further (World Bank, 2016).

There is a major risk to the availability of fresh water. Rainfall is the main source of fresh water; however, South Africa has an average annual rainfall of 490 mm and this is deemed to be half the world's average (WWF, 2017). Groundwater is also available; however, this only accounts for 10% of fresh water (WWF, 2017). Untreated or poorly treated sewage, as well as leaks, heavily impact the water quality and, therefore, threaten the fresh water supply in South Africa (WWF, 2017).

Companies have the ability to drive change quicker than that of governments and it is in their direct business interest to act (CDP, 2018). There is an assumption that companies have a moral and legal obligation for the consequences that water management can have on the environment. Through responsible behaviour, companies can help solve the current problems of water pollution and contamination of water supplies, as well as the concerns of economic development and growth (Sánchez-Hernández et al., 2017).

Huge backlogs have been inherited by the newly elected government in terms of access to water sanitation and supply. After apartheid, 15 million people did not have a safe water supply and over 20 million are without adequate sanitation facilities in South Africa. Prof Kader Asmal, appointed in 1994 by President Nelson Mandela as his first water minister, developed the first real equitable legislation framework for comprehensive water management in South Africa, together with addressing the water sanitation backlogs inherited from the apartheid regime (WRC, 2014).

In recognition of the interdependence and complexity of water usage and availability, the World Business Council for Sustainable Development combined business-related risk into five separate categories (Christ & Burritt, 2017).

2.2.3.1 Financial risk

Financial risk concerns the challenges on businesses' financial successes, as a result of steep increases in insurance, electricity bills, cost of credit, as well as falling investor confidence. Further to this, water demand growth and high pollution levels are expected to increase the cost of water access for businesses.

2.2.3.2 Operational risk

Water scarcity, as well as flooding, pose a direct risk to organisations. The result of this is businesses experiencing disruptions to water supplies or unscheduled water interruptions, which, ultimately, affect the supply chain function of the organisation (Botha, 2015).

Various companies have experienced insecure water supplies. Askham & Van der Poll (2017) cite platinum mining company, Anglo American, as experiencing insecure water supplies. This water-intensive mining company was forced to halt platinum mining because of the water shortage in the Limpopo province. This is an example of how poor water management will serve to have a detrimental impact on both individual companies, as well as the economy.

2.2.3.3 Product risk

This refers to the possible loss of market share due to consumer concerns and a change in customer preferences (Christ & Burritt, 2017).

2.2.3.4 Reputational risk

This can result in a potential conflict with the community, as well as operating licenses. The water practices of businesses are always scrutinised by the public and this can result in adverse effects on the company's reputation. Further to this, there is a lot of attention on the way companies withdraw water and discharge wastewater (Askham & Van der Poll, 2017). It is, therefore, important for companies to liaise with the public prior to implementing new ideas and developments.

2.2.3.5 Regulatory risk

Pressure is being felt by regulatory authorities in terms of introducing stricter measures to restrict the abuse of water. These measures include higher fines, as well as water restrictions. These changes increase business costs; therefore, companies need to familiarise themselves with these changes in regulations in order to prevent paying high fines or having water restrictions (Askham & Van der Poll, 2017).

These water-related business risks are further intensified due to water scarcity, poor quality of water, as well as climate change. Therefore, companies need to understand these business risks

and find ways to mitigate these risks as this puts a downward pressure on a company's profitability.

A study performed by the Carbon Disclosure Project (CDP) (2018) on the Top 100 companies with the highest market capitalisation in South Africa revealed that companies have shown strengths with regards to water governance. 73% of companies have put in place standards and water policies, whilst 91% of the companies have integrated water into their strategies. 89% of the responding companies have set water targets and 50% of the companies do not have any engagement with their supply chain partners with regards to water sustainability. Similarly Askham & Van der Poll (2017), who performed a study on nine South African mining companies, concluded that mining companies have shown good water stewardship. Companies are able to show evidence that there is a level of management involvement and overseeing that water policies are in place, as well as targets set in terms of reduction of water consumption and wastewater discharge. However, the concerning factors are that very few companies were able to provide evidence of third party verification of water information disclosure and similar to CDP (2018), engagement with the supply chain partners regarding water sustainability is greatly lacking.

Sánchez-Hernández et al. (2017) assessed whether South African companies related to agriculture considered water management reporting to be important for sustainability purposes. The study revealed that companies recognise that the availability and quality of water have become a strategic sustainability issues that require proper management. Companies included useful information about water sustainability for their stakeholders. However, similar to studies performed by Haji & Anifowose (2016) & Stacchezzini et al. (2016), these companies are motivated by compliance factors rather than ethical spirit. Positive factors were communicated whilst omitting negative areas, which could impact the reputation of the organisation. External pressures had an impact on the level of specific disclosures provided.

2.3 THEORETICAL AND CONCEPTUAL LITERATURE REVIEW

2.3.1 The Conceptual Framework and IFRS

In March 2018, a revised conceptual framework for financial reporting was issued by the International Accounting Standards Board (IASB). The purpose of the conceptual framework is "to assist the Board to develop IFRS Standards (Standards) based on consistent concepts,

resulting in financial information that is useful to investors, lenders and other creditors" (IFRS, 2018 p 6). It is also beneficial for auditors in terms of providing an opinion on whether the financial statements are in accordance with IFRS and the interpretation of the financial statements by the users (Gornik-Tomaszewski & Choi, 2018). The conceptual framework further makes mention that financial reports should provide information for the needs of investors for decision making. However, the conceptual framework does not make mention of which information will be of the best assistance to investors (Barker & Teixeira, 2018). The conceptual framework is not an accounting standard and it does not override any requirement in an IFRS. If the conceptual framework and IFRS do not agree on a matter, the IFRS takes preference (IFRS, 2017).

High-quality financial reporting standards are viewed as a contributing factor that will allow for companies to utilise and provide quality reporting on their economic state and performance within a specified measurement period. However, Ames (2013) studied accounting quality and the impact of IFRS. His finding concluded that IFRS enhanced reporting quality in South Africa. Similarly, Elbannan (2010) confirmed in his study that earnings management and accounting quality has not improved after the adoption of IFRS due to a lack of enforcement by regulators.

Performance has been identified by the conceptual framework as a key source of financial information that is required for decision-making purposes. Water sustainability reporting may also be a manifestation of performance, which can provide valuable information for decision-making purposes, although there is no specific IFRS relating to this. Investors can possibly expect that emerging risks, such as climate change, could affect the disclosures and amounts reported in the financial statements, thereby impacting decision making. Authorities acknowledge that there is a need to improve the quality of information flowing to stakeholders, especially to investors who are able to assess risks and opportunities linked to their investment (Jackson, Bartosch, Avetisyan, Kinderman, & Knudsen, 2019).

2.3.2 Global Reporting Initiatives

In the area of sustainability, the GRI is known to be a prominent association that has encouraged sustainability reporting. The GRI pioneered sustainability reporting since 1997 when it was founded in Boston. The GRIs sustainability reporting framework and standards

that have been established are being used extensively around the world (GRI, 2018). Voluntary disclosures, principles, as well as key performances indicators (KPIs) are provided in the framework in order to assist organisations to accurately report on their sustainability (Lynch, Lynch, & Casten, 2014). The GRI has been found to be the most widely used voluntary reporting guideline across the world (KPMG, 2015). Similarly, Skouloudis, Evangelinos, & Kourmousis (2009) made mention that the sustainability reporting guidelines are globally recognised, thereby assisting in the comparison of information for investors around the globe. In fact, 93% of the world's largest 250 corporations have reported on their sustainability performance (KPMG, 2017). The GRI first focused on environmental aspects. Thereafter, it included economic and social matters (EY, 2016). An assumption was that this information empowered investors and other stakeholders to request or demand accountability from the organisations. Furthermore, it serves the interest of organisations that aim to be progressive to become more accountable, transparent and socially responsible (Brown, de Jong, & Levy, 2009).

2.3.3 Legitimacy theory

Legitimacy theory presumes that companies provide additional disclosures in order to maintain the legitimacy of the company amongst society. This has provided better understanding as to why companies disclosure voluntary social and environmental factors. Corporations may have several motivations for social and environmental reporting and legitimising corporate operations appears to be one of these motivations (Deegan, 2002). Villiers & Van Staden (2011) assessed the nature and extent of environmental disclosures and made use of the legitimacy theory to arrive at the conclusion that companies that have had poor environmental performance provided a greater number of disclosures to limit their threat of legitimacy. Limited or non-disclosure by companies relating to environmental, social and ethical disclosures have been explained through the legitimacy theory (Stubbs, Higgins, & Milne, 2013). Similarly, Setia, Abhayawansa, Joshi, & Huynh (2015) conclude that South African companies have adopted a legitimacy strategy in their preparation of integrated reports.

Legitimacy theory, therefore, influences this research in terms of the main research objective, which is to ascertain the level of disclosure in terms of water sustainability risks. Due to external pressures, companies may use discretion and thereby limit or provide no water sustainability disclosures in their integrated reports.

2.3.4 Signalling theory

Classical signalling theory makes reference to two parties involved, namely the sender of a signal and the receiver who perceives the information to be useful (Spence, 2002). Signalling theory reduces the information asymmetry between the signallers and the signal receivers. Companies that are anticipating better financial and non-financial results send signals via additional disclosures to potential investors. However, value creation is limited if investors are unable to interpret the signals effectively (Connelly, Certo, Ireland, & Reutzel, 2010). CEOs signal the quality of their firms to potential investors via the compilation of financial statements (Zhang & Wiersema, 2009). Furthermore, external directors who are present on the board could be interpreted as a positive signal of corporate governance that distinguishes it from other companies (Certo, Daily, & Dalton, 2001).

Investors require further disclosures specifically relating to water sustainability in order to determine whether the companies are identifying, measuring and managing their water-related risks effectively. Therefore, companies need to provide specific disclosures in such a way that they can be effectively interpreted by investors to assist in decision making.

2.3.5 Decision-usefulness theories

Decision-usefulness theories presume that companies provide disclosures based on the decision making needs of their stakeholders (Rikhardsson & Holm, 2008). The theory assumes that disclosures are valued depending on their usefulness to their users (Martin & Hadley, 2005). Mitchell & Quinn, (2005) performed a study of users' views of disclosures. Their findings revealed that users anticipated a greater level of disclosure, but preparers were not aware of this expectation. Similarly, users rated certain disclosures more important than what preparers thought, thereby revealing an expectation gap between the two parties.

Furthermore, Kamala, Wingard, & Cronjé (2015) performed a study on the environmental reporting expectation gap. Their findings revealed significant differences between the views of preparers and users with regards to what decision useful environmental reporting should entail. Another study by Delmas & Burbano (2011) reveals that users have argued that disclosures were subjective and sporadic, with very few disclosures of negative information, although such information existed.

Decision usefulness theory influences this research since companies need to provide useful disclosures for investors to make appropriate decisions. Investors require specific disclosures relating to water sustainability and deem it to be useful, therefore, companies need to provide these disclosures to meet their specific needs.

2.4 CONCLUSION

This chapter focused on the existing literature relating to integrated reporting, as well as water sustainability disclosures and water-related risks in order to lay the foundation of this study. It is evident that South Africa is vulnerable to water risks and needs to act urgently to protect its water resources. Companies have the ability to drive this change quickly. Companies need to become more aware of these risks facing them and ensure that they measure and manage their water sustainability risks in accordance with their performance standards and goals. Previous studies have shown that companies lack the monitoring and measurement of water sustainability risks of their supplies throughout the supply chain process; however, all parties involved in the supply chain process need to be proactive in managing this scarcity. Disclosure of water sustainability risks needs to be more apparent in the integrated reports of these companies. This chapter further discussed guidelines and frameworks available in relation to integrated reporting and water sustainability disclosures. This can assist water-intensive companies to implement and disclose good water practices in their organisation, thereby allowing for this scarce resource to be protected.

The next chapter will unpack the research methodology used in the study

Chapter 3

Research Design and Methodology

3.1 INTRODUCTION

The previous chapter provided insight into the relevant literature, as well as the theoretical and conceptual framework that underpins this study. This chapter focuses on the methodology adopted in this research. It lists the research questions pertinent to this study, describes the research design and paradigm used. This chapter further discusses the research population, research sample and how data were collected and analysed in this study. Finally, the validity and reliability, ethical considerations and delimitations of the study are discussed

3.2 RESEARCH QUESTIONS

Research question one

What is the practice of water sustainability disclosures in the annual integrated reports of JSE listed companies in South Africa?

Research question two

What are the levels of management involvement of water sustainability disclosures in the annual integrated reports of JSE listed companies in South Africa?

Research question three

What is the management process and performance measurement systems for the reporting of water sustainability disclosures in the annual integrated reports of JSE listed companies in South Africa?

3.3 RESEARCH DESIGN AND PARADIGM

The approach implemented for this study was that of a qualitative research design in the form of content analysis using integrated reports of JSE listed South African companies to examine water sustainability disclosures. Due to the narrative type of disclosure being used by companies, the interpretivist paradigm was used to gather and interpret the qualitative data in

integrated reports focusing on water sustainability disclosures. This interpretivist approach will focus on the language and meanings of the disclosures included in the integrated reports of JSE listed South African companies.

Annual integrated reports of companies will be downloaded for 2018. If the 2018 integrated reports are not available during the time of this study, then the latest available integrated report will be used. These reports will be analysed and assessed according to the Disclosure Assessment and Performance Tool that has been generated from the current frameworks such as the Carbon Disclosure Project, Global Reporting Initiative and Ceres Aqua Gauge. Refer to Appendix A for the Disclosure Assessment Tool used for this study.

3.4 RESEARCH POPULATION

The population will include four sectors: the food production sector, the construction sector, the mining sector and the oil and gas sector. These four sectors are considered to be water-intensive sectors. The companies that are part of the population are South African companies listed on the JSE and the company's principal place of business is in South Africa. On 5 February 2020, the JSE listed South African companies: Food production sector – 15 companies; construction sector – 16 companies; mining sector – 25 companies; and oil and gas sector – 6 companies. The total population of all four sectors is, therefore, 62 companies for this study.

3.5 RESEARCH SAMPLE

Purposive sampling is a non-probability sample also known as subjective, selective or judgemental sampling. When you need to obtain a targeted sample, this sampling technique is useful and where the main concern is not sampling for proportionality (Nicki, 2018).

Purposive sampling was used, as sectors that are water-intensive were chosen to be part of this study and those sectors that are not water-intensive will not provide water disclosures in detail as part of their reporting structure. Companies that disclosed information on their water footprint were included to ascertain their disclosure of risks specifically relating to water, to determine their awareness, performance standards and goals that have been set and if they are measuring and managing their water sustainability risks in relation to their own and their suppliers' performance standards set throughout the supply chain process.

Table 3. 1 Number of JSE listed companies per sector

Sectors	**Population**	**Sample**
Construction sector	16	16
Food production sector	15	15
Industrial metal and mining sector	25	25
Oil and Gas sector	6	6
Total	**62**	**62**

3.6 DATA COLLECTION METHODS

The method used for data collection is content analysis. Content analysis has numerous advantages. The entity under observation is not aware that it is being researched; instead, the information to be examined is the publicly available text. Content analysis was chosen in this study as the information is readily available and this data can be viewed over a period of time without the knowledge and approval of the selected company (Krippendorff, 2004).

3.6.1 Data collection procedure

The King IV Code requires that companies not only report on their financial statements but also provide communication with respect to integrated reporting and sustainability (Esterhuyse & Wingard, 2016). These reports compiled by the management of the company provide insight into the company's performance and are regarded as public information as they are placed in the investor relations sections of the relevant company's website.

There are two types of data that can be collected, primary data and secondary data. Primary data are original information collected directly whilst secondary data are already in existence or made public by others. Secondary data are generally free and easily accessible data to collect for research purposes. In terms of this study, secondary data were used since annual integrated reports of JSE listed companies are public information available on the company's websites. These integrated reports contain the relevant water sustainability disclosures that are required to respond to the aims and objectives of this study.

The secondary data required for this research were obtained by downloading from the company's webpage and analysing the 2018 integrated reports of selected JSE listed South African companies in the construction sector, food production sector, industrial metal and mining sector and the oil and gas sector. In some instances, the reports published on the water sustainability disclosure refer to another report, mainly the sustainability report, Therefore, the integrated report, together with the sustainability report, will be used as the main sources of

data for this study. This type of content analysis research was performed by Askham & Van der Poll (2017) in their study of nine mining companies' integrated reports of 2013.

A total of 62 annual integrated reports/sustainability reports were obtained and the data in these reports were selected and evaluated in accordance with the set of questions reflected in the Disclosure Assessment and Performance tool. In particular, the selected data are based on information relating to water sustainability disclosures, which have been included in the integrated reports of the JSE listed South African companies. Further explanations with regards to the Disclosure Assessment and Performance tool will be discussed below.

The Disclosure Assessment and Performance tool used to collect data and analyse the integrated reports of the selected South African companies has three categories. The categories contain a list of questions relating to water sustainability, which will be answered using the integrated reports of the selected companies. The categories are linked to each of the three research questions pertinent to this study. An explanation of each category that represents a specific research question is provided below.

Category 1: Disclosure

The disclosure category evaluates how comprehensively the company makes disclosures relating to water sustainability as part of its integrated reports, as well as how its integrated water information is part of its published financial reports. This category requests evidence of water disclosures - if they have been audited and aligned to Aqua gauge disclosure, GRI and CDP frameworks.

Category 2: Levels of management involvement

The measurement category gives insight into the level of management that is directly charged with oversight on water management as well as senior management involvement in terms of the disclosures of water sustainability. Board oversight and commitment from higher levels of management give a good indication that water is a material element in the business and thus should be managed effectively. In addition, the company should have a policy or guideline that is internally developed so that company-specific targets are reached with respect to water. The tool finally determines the extent of performance standards and goals that they have implemented in relation to water sustainability risks

Category 3: Management process and performance measurement systems

The last category of the assessment tool focuses on the identification, measurement and management processes of the company's water sustainability risks in accordance with their own performance standards and goals. This focuses on the collection and monitoring of data obtained, which relates to the company's own regulatory compliance, their usage of water, other external factors that could influence their water sources, such as climate change, their stakeholder concerns and perceptions and the water management practices of its suppliers.

Table 3. 2 Overview of the disclosure assessment tool and the list of companies that will be assessed

Industry Sectors	Companies	Categories of the Disclosure Tool	Questions
Construction sector	1) Afrimat, 2) Aveng 3) Basil Read 4) Brikor 5 Consolidated Infrastructure Group 6) Esor 7) Group Five 8) Mazor 9) Murray & Roberts 10) PPC 11) Raubex 12) Sephaku Holdings 13) Stefanutti Stocks 14) Trellidor Holdings 15) W G Wearne 16) Wilson Bayly Holmes-Ovcon	1)Disclosure 2) Levels of management's involvement 3) Management process and performance measurement systems	**Disclosure**: 1. Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the frameworks such as the Global reporting initiatives, water disclosure project, Ceres Aqua Gauge, International integrated reporting council? 2. Does the company include water information as part of its published financial reports? 3. Does the company show evidence of water disclosures that have been audited by external auditors? **Levels of Management's involvement:** 1. How involved are senior executives in managing water sustainability risks? 2. What role does the board play with regards to oversight of water sustainability? 3. Does management take into consideration water in their investment decision making or business planning? 4. Has management set itself performance goals or standards on their consumption of water? 5. Has management set itself performance goals or standards on their wastewater
Food production sector	1)AH-Vest 2) Astral Foods 3) AVI 4) Clover industries 5) Crookes Brothers 6) Kaap Agri 7) Nutritional Holding 8) Oceana Group 9) Pioneer Food 10) Premier Food and Fishing 11) Quantum Food 12) RCL Food 13) Rhodes Foods 14) Tiger Brands 15) Tongaat Hulett.		

Industrial metal and mining sector	1)African Rainbow Minerals **2)** Andulela Investment Holdings 3) Anglo American Platinum 4) Anglo Gold Ashanti 5) Arcelomital SA 6) Assore 7) Bauba Platinum 8) BSI Steel 9) Crometco 10) DRD Gold 11) Goldfields 12) Harmony Gold Mining 13) Hulamin 14) Impala Platinum 15) Kumba Iron Ore 16) Marafe Resources 17) Master drilling 18) Northam Platinum 19) Pan African Resources 20) Rand Gold Exploration 21) Royal Bafokeng Platinum 22) Sibanye Stillwater 23) Transhex Group 24) Union Atlantic Minerals 25) Wesizwe Platinum	discharged into the environment? 6. Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent? 7. Does management have a water policy in place which recognises the importance that water is to the organisation? **Management process and performance measurement systems** 1. Has the company identified water risks as part of its operation? 2. Has the company provided the total water withdrawal/consumption from all sources? 3. Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water? 4. Does the company provide training to staff relating to water usage? 5. Is data collected and monitored on external factors affecting their water source? 6. Does the company monitor and manage regulatory compliance relating to water consumption and discharge? 7. Does the company collect and monitor data on stakeholder concerns and perceptions? 8. Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?
Oil and gas sector	1) Efora Energy 2) Exxaro Resources 3) Keaton Energy Holdings (Wescoal) 4) MCMining 5) Sasol 6) Sentula Mining(Unicorn)	

Source: (CDP, 2018) (Ceres, 2018) (GRI, 2018)

3.7 DATA ANALYSIS

The integrated reports will be skimmed through using Adobe Acrobat reader and the search function to identify data on any information relating to water sustainability. Once the information has been found, the data will be transferred to a separate document.

A separate document containing the relevant information on water sustainability will be analysed and questions in the Disclosure Assessment and Performance Tool will be rated. This water Disclosure Assessment and Performance Tool is the measuring instrument for this study and has been derived from Ceres Aqua gauge disclosure, GRI framework and the CDP framework. It contains a set of questions that fall into three categories. For each question, the company were rated according to a rating scheme from D to A. Thereafter, further explanations were provided to substantiate the rating score achieved for the particular question. Quotations

included in the integrated reports of the selected companies will be evaluated to determine the rating score they achieve. The rating scores are determined as follows:

- **Rating score D**: The company has not provided evidence, therefore, has not achieved the criteria.
- **Rating score C**: The company has provided limited evidence and discussions relating to the criteria.
- **Rating score B**: The company has provided specific discussions and evidence; however, certain limitations are still apparent.
- **Rating score A**: Adequate and sufficient evidence and discussions have been provided in relation to the criteria, which allows for the criteria to be achieved.

3.8 RELIABILITY, VALIDITY AND TRUSTWORTHINESS

- The findings of this study were confirmed through triangulation with similar studies performed. This provided evidence for validity
- Reliability was ensured by giving this study to my supervisors, as well as PhD students who then provided positive feedback on the data interpretations. Some companies have also had these integrated reports independently audited by third parties thereby maintaining or enhancing the level of validity and reliability
- Trustworthiness was achieved through discussions and feedback from the supervisors

3.9 ETHICAL CONSIDERATIONS

There was no expectation of any ethical issues throughout the study. Information that is publicly available in the form of annual reports was used in this study. No consent was required with regards to the usage of these integrated reports. Proper citations and referencing of all articles were performed. Although the study is based on secondary data, permission was obtained from the UKZN research office to conduct the study. There was no need for the gatekeeper's letter to conduct the study.

3.10 DELIMITATIONS OF STUDY

The population is limited to only four sectors: the food production sector, the construction sector, industrial metal and mining sector and the oil and gas sector. Only JSE listed companies that have their principal place of business in South Africa were chosen in this sample.

3.11 **CONCLUSION**

This chapter presented the research methodology employed to conduct this study. Content analysis was used for the data collection and data analysis of this study. The chapter further discussed the research questions pertinent to this study and the research design and paradigm used. This chapter further discussed the research population, research sample, the research objectives were restated and the research design, population and sampling. validity and reliability, ethical considerations and delimitation of the study.

Chapter 4

Research Results and Findings

4.1 INTRODUCTION

The research performed on each of the selected South African companies is covered in this chapter and this fulfils the research objectives of this study. The Disclosure Assessment and Performance Tool, as discussed in Chapter 3, is broken down into three categories. These three categories are disclosure, levels of management's involvement and the management process and performance measurement systems. This chapter focused on utilising the Disclosure Assessment and Performance Tool to analyse the integrated reports of the selected South African companies in order to respond to the three research questions that are pertinent to this study.

4.2 RATING SCHEME

The sample selected South African companies will be rated according to the rating scheme of D – A for each question listed under each of the three categories of the Disclosure Assessment and Performance Tool as discussed in Chapter 3. Explanations were provided to substantiate the ratings given for each question. Each company will be analysed according to the sector that they relate to. The sample selected sectors for the study are the construction sector, food production sector, industrial metal and mining sector and oil and gas sector.

Table 4. 1 Rating scheme description

	Description of ratings	Rating/Score
1	The company has not provided evidence, therefore, has not achieved the criteria.	D
2	The company has provided limited evidence and discussions relating to the criteria.	C
3	The company has provided specific discussions and evidence; however, certain limitation is still apparent.	B
4	Adequate and sufficient evidence and discussions have been provided in relation to the criteria, which allows for the criteria to be achieved.	A

The 62 selected companies' integrated reports were analysed on a per-sector basis below, using the Disclosure Assessment and Performance Tool.

4.3 CONSTRUCTION SECTOR

This sector is heavily reliant on cement and other water-reliant construction materials. The companies disclosed that their risk increases if there are extreme changes in weather patterns at their operations and they have made mention of recent changes in rainfall (CDP, 2018).

The construction sector include the following 16 companies:

1) Afrimat (AF1), **2)** Aveng (AV2), **3)** Basil Read (BA3), **4)** Brikor (BR4), **5)** Consolidated Infrastructure Group (CO5), **6)** Esor (ES6), **7)** Group Five (GR7), **8)** Mazor (MA8), **9)** Murray & Roberts (MU9), **10)** PPC (PP10), **11)** Raubex (RA11), **12)** Sephaku Holdings (SE12), **13)** Stefanutti Stocks (ST13), **14)** Trellidor Holdings (TR14), **15)** W G Wearne (WG15) , **16)** Wilson Bayly Holmes-Ovcon (WI16)

Table 4. 2 Analysis of companies 1 - 12 in the construction sector – Category 1: Disclosure

Company number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. Disclosure												
1. Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the frameworks such as the Global reporting initiatives, water disclosure project, Ceres Aqua Gauge, International integrated reporting council?	C	B	C	C	D	C	B	C	B	B	C	C
2. Does the company include water information as part of its published financial reports?	C	D	D	D	D	D	D	D	D	D	D	D
3. Does the company show evidence of water disclosures that have been audited by external auditors?	D	D	D	D	D	D	C	D	A	B	D	B

Table 4. 3 Analysis of companies 1 - 12 in the construction sector – Category 2: Level of Management

2. Levels of management involved	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. How involved are senior executives in managing water sustainability risks?	C	C	D	C	D	D	C	C	C	C	C	C
2. What role does the board play with regards to oversight of water sustainability?	C	C	C	C	D	D	C	C	C	C	C	C
3. Does management take into consideration water in their investment decision making or business planning?	D	B	A	B	D	B	B	D	A	B	B	B

2. Levels of management involved	1	2	3	4	5	6	7	8	9	10	11	12
4. Has management set itself performance goals or standards on their consumption of water?	B	B	D	D	D	D	B	D	B	B	D	B
5. Has management set itself performance goals or standards on their wastewater discharged into the environment?	D	D	D	D	D	D	D	D	D	D	D	D
6. Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent?	D	D	D	D	D	D	D	D	D	D	D	D
7. Does management have a water policy in place which recognises the importance that water is to the organisation?	D	D	D	D	D	A	A	D	A	D	A	D

Table 4. 4 Analysis of companies 1 - 12 in the construction sector – category 3: Performance management systems

3. Performance Management Systems	1	2	3	4	5	6	7	8	9	10	11	12
1. Has the company identified water risks as part of its operation?	C	C	C	D	D	D	C	D	C	C	C	D
2. Has the company provided the total water withdrawal/consumption from all sources?	D	A	D	D	D	A	D	D	A	C	D	A
3. Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water?	D	D	D	D	D	D	D	D	D	D	D	D
4. Does the company provide training to staff relating to water usage?	A	A	C	D	D	C	C	D	A	D	D	D
5. Is data collected and monitored on external factors affecting their water source?	D	C	C	D	D	C	C	D	D	C	D	D
6. Does the company monitor and manage regulatory compliance relating to water consumption and discharge?	B	C	C	D	D	C	C	C	B	B	B	B
7. Does the company collect and monitor data on stakeholder concerns and perceptions?	A	A	A	A	D	A	A	A	A	A	A	A
8. Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?	D	D	D	D	D	D	D	D	D	D	D	D

Table 4. 5 Analysis of companies 13 – 16 in the construction sector – Category 1: Disclosure

Company number	13	14	15	16
1. Disclosure				
1. Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the reporting initiatives such as the Global reporting initiatives, water disclosure project, Ceres Aqua Gauge and International integrated reporting council?	B	C	D	B
2. Does the company include water information as part of its published financial reports?	D	D	D	D
3. Does the company show evidence of water disclosures that have been audited by external auditors?	C	D	D	B

Table 4. 6 Analysis of companies 13 - 16 in the construction sector – Category 2: Levels of Management involvement

2. Levels of management involved	13	14	15	16
1. How involved are senior executives in managing water sustainability risks?	C	C	C	C
2. What role does the board play with regards to oversight of water sustainability?	C	C	C	C
3. Does management take into consideration water in their investment decision making or business planning?	D	B	B	B
4. Has management set itself performance goals or standards on their consumption of water?	B	D	B	B
5. Has management set itself performance goals or standards on their wastewater discharged into the environment?	D	C	D	D
6. Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent?	D	C	D	D
7. Does management have a water policy in place which recognises the importance that water is to the organisation?	A	D	A	A

Table 4. 7 Analysis of companies 13 - 16 in the construction sector – category 3: Performance Management System

3. Performance Management system	13	14	15	16
1. Has the company identified water risks as part of its operation?	D	D	C	D
2. Has the company provided the total water withdrawal/consumption from all areas with water stress per source?	A	D	D	C
3. Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water	D	D	D	D
4. Does the company provide training to staff relating to water usage	C	C	C	C
5. Is data collected and monitored on external factors affecting their water source	C	D	D	D
6. Does the company monitor and manage regulatory compliance relating to water consumption and discharge?	B	D	C	B
7. Does the company collect and monitor data on stakeholder concerns and perceptions?	A	A	A	A
8. Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?	D	D	D	D

Category 1: Disclosure

1. **Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the reporting initiatives such as the Global Reporting Initiatives, Water Disclosure Project, Ceres Aqua Gauge, International Integrated Reporting Council?**

W G Wearne and Consolidated Infrastructure Group did not provide any information in their annual reports specifically relating to water sustainability, therefore, a score of 'D' was given. Eight of the 16 companies (AF1, BA3, BR4, ES6, MA8, RA11, SE12, TR14) in the sector

provided limited disclosures relating to water sustainability and were given a score of 'C'. Disclosures relating to the level of management involvement, measurement of water consumption and discharge and monitoring of compliance requirements were provided with limited detail, therefore, they are regarded as only beginning to implement the practice.

Good progress was made by six of the 16 companies (AV2, GR7, MU9, PP10, ST13, WI16) by providing specific details relating to water sustainability, however, there were still gaps in the approach in terms of disclosing their water measurements, senior executives involved in the process, stakeholder concerns and the engagement with its suppliers with regards to water sustainability. A score of 'B' was given. No company received a score of 'A' as each company was lacking a specific disclosure criterion in relation to water sustainability measures. Specifically, none of the 16 companies provided evidence of their engagement with their supply chain partners with regards to water sustainability.

2. **Does the company include water information as part of its published financial reports?**

Afrimat mentioned water as part of its published financial reports; however, this was minimal and was mentioned as part of the ingredients in the product manufactured; therefore, a score of 'C' was given. The remaining 15 companies (AV2, BA3, BR4, CO5, ES6, GR7, MA8, MU9, PP10, RA11, SE12, ST13, TR14, WG15, WI16) were given a score of 'D' as they did not provide any water disclosures as part of their published financial reports, including the notes to the financial statements. There were no integrative discussion of water risks together with financial performance data in the annual reports.

3. **Does the company show evidence of water disclosures that have been audited by external auditors?**

Ten of the 16 companies (AF1, AV2, BA3, BR4, CO5, ES6, MA8, RA11, TR14, WG15) provided no evidence of water disclosures being audited; therefore, a score of 'D' was given. Group Five made mention that they conduct internal and external environmental audits to ensure compliance with all environmental requirements. Stefanutti Stocks mentioned that 748 systems and compliance audits were conducted. Both companies were given a score of 'C'. It was assumed that only some data related to water would have been audited as no specific details were provided.

Three of the 16 companies (PP10, SE12, WI16) were given a score of "B" as they mentioned that there were audits of water compliance, including the compliance of the water use licenses; therefore, all water data can be assumed to be audited. Compliance scores against the requirements were also disclosed; however, details of who performed these audits were not disclosed. Murray and Roberts was given a score of "A" as they used the services of IBIS ESG Assurance (Pty) Limited to perform an audit, which included water data. Due to specific discussions that included the type of audit being performed together with the company that will be performing it, achievement of the criteria had been met.

Category 2: Levels of management involved

1. **How involved are senior executives in managing water sustainability risks?**

Three of the 16 companies (BA3, CO5, ES6) provided no evidence of senior executive involvement in managing water sustainability risks and were given a 'D' score. The remaining 13 companies provided limited information about senior executive involvement. The CEO reports made mention of their commitment to the responsible usage of water, however, no further details of executive involvement were provided. There are no clear lines of responsibility and there is no incentive compensation for senior executives relating to water sustainability achievements. These 13 companies were, therefore, given a score of 'C'.

2. **What role does the board play with regards to oversight of water sustainability?**

Two of the 16 companies (CO5, ES6) provided no evidence of an oversight role by the board and were given a score of 'D'. The remaining 14 companies had a sub-committee such as a social and ethics committee, which was responsible for water sustainability of which is required to report to the board. However, limited details were provided regarding how often the board is briefed on water sustainability risks and how explicit is the oversight with regard to water sustainability issues. Therefore, the 14 companies received a score of 'C'.

3. **Does management take into consideration water in their investment decision making or business planning?**

Four of the 16 companies (AF1, CO5, MA8, ST13) provided no evidence of considering water in business planning and investment decision making. These four companies received a score of 'D'. Basil Read mentioned the impact that water has on many businesses. As part of their

business planning, they use rainwater from buildings' roofs, as well as water from drainage systems collected in storage tanks for irrigation purposes, thereby reducing the pressure on the municipal water supply. They were given a score of 'A'. Murray and Roberts mentioned that due to environmental concerns, they decided to include more wastewater treatment and sea water desalination capabilities. They piloted this innovative technology at the Verulam wastewater treatment facility in partnership with the eThekwini Water and Sanitation Department. They were given a score of 'A'.

The remaining 10 companies (AV2, BR4, ES6, GR7, PP10, RA11, SE12, TR14, WG15, WI16) merely mentioned their commitment to operating an efficient and sustainable business, taking into consideration environmental factors such as the responsible usage of water and minimising discharge into the environment. Good progress was made in their disclosure, however, there is no systematic programme in place to reduce the water impacts of its business operations. These companies were, therefore, given a score of 'B'.

4. **Has management set itself performance goals or standards on their consumption of water?**

Seven of the 16 companies (BA3, BR4, CO5 ES6, MA8, RA11, TR14) provided no evidence of performance standards and goals in place with the reduction in water withdrawal or consumption at its facilities. A score of 'D' was given for these seven companies. The remaining nine companies (AF1, AV2, GR7, MU9, PP10, SE12, ST13, WG15 WI16) had set performance targets relating to water consumption that was cascaded to all business platforms; however, no aggressive performance target was set for water stress facilities or areas of the business that consume a greater amount of water. A score of 'B' was, therefore, given for these companies. Group 5 have set group water reduction targets and included the reduction of water consumption as one of its focus areas. PPC limited indicated that their performance target is to reduce consumption by 5%. W G Wearne mentioned that they achieve continual improvement by identifying significant environmental aspects and set objectives and targets while reviewing performance.

5. **Has management set itself performance goals or standards on their wastewater discharged into the environment?**

Trellidor Holdings mentioned that they adhere to high quality standards of wastewater, however, no wastewater targets were disclosed in the integrated report, therefore, a score of 'C' was given.

The remaining 15 companies had not set performance standards relating to wastewater discharge in their integrated reports; furthermore, there was no mention of wastewater compliance being met by these companies. The focus of the companies in this sector was to set targets on the reduction of water consumption mainly.

6. **Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent?**

Trellidor Limited mentioned that they utilise a modern effluent plant to reduce environmental impact. However, the description of the minimum standards and how it was determined were not discussed. Trellidor Limited was, therefore, given a score of 'C'.

The remaining 15 companies provided no descriptions of standards for the discharge of their effluent. These companies, therefore, received a score of 'D'.

7. **Does management have a water policy in place which recognises the importance that water is to the organisation?**

Seven of the 16 companies (ES6, GR7, MU9, RA11, ST13, WG15, WI16) either have a water policy in place or have an overall environmental policy that sets out clear goals and guidelines that include action required with regards to water sustainability. This policy is publicly available and the companies have shown its commitment to water. Therefore, these companies were given a score of 'A', because achievement of criteria had been met.

The remaining nine companies (AF1, AV2, BA3, BR4, CO5, MA8, PP10, SE12, TR14) did not have any policy in place that included goals and guidelines relating to the usage of water. These companies received a score of 'D'

Category 3: Identification/Measurement/Management processes

1. **Has the company identified water risks as part of its operation?**

Eight of the 16 companies (AF1, AV2, BA3, GR7, MU9, PP10, RA11, WG15) merely mentioned water shortages and inconsistency in the quality of water as a key risk. However,

there were no discussions of tools being used to identify water risk areas in terms of quality and scarcity. There were no discussions relating to the potential change in the quality and availability of water in order to develop a better understanding of the current and future water sustainability risks. Therefore, these companies received a score of 'C'.

The remaining eight companies (BR4, CO5, ES6, MA8, SE12, ST13, TR14, WI16) provided no disclosures of water-related risks relating to their direct operations, therefore, they were given a score of 'D'.

2. **Has the company provided the total water withdrawal/consumption to all sources?**

Esor Limited derived its water from three rivers, one borehole, groundwater and municipal water. The total amount of wastewater amounted to 116 million litres, of which approximately 60% was recycled and used for dust suppression. Siphaku Holdings indicated that it consumed 72 litres of borehole water per tonne of clinker. Aveng consumed a total amount of 940 260kl of water, a 54% increase. Aveng operations use mainly municipal water. Murray and Roberts, as well as Stefanutti Stocks both disclosed their water withdrawal in the form of a graph showing comparative years. These companies were given a score of 'A'.

PPC and WBHO mentioned their consumption of water, however, they did not mention the sources of the water. They were given a score of 'C'. The remaining nine companies (AF1, BA3, BR4, CO5, GR7, MA8, RA11, TR14, WG15) provided no disclosures relating to their water withdrawal to all sources. They were given a score of 'D'

3. **Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water?**

None of the 16 companies provided disclosures relating to water discharge to areas per destination. The main focus of this sector, relating to water sustainability, was the consumption or withdrawal of water only. All 16 companies received a score of 'D'

4. **Does the company provide training to staff relating to water usage?**

Six of the 16 companies (BR4, CO5, MA8, PP10, RA11, SE12) provided no disclosure relating to the training of staff relating to water usage or environmental issues in general. These companies received a score of 'D'

Three of the 16 companies (AF1, AV2, MU9) indicated that they provide training to staff with specific reference to water sustainability measures. These companies were given a score of 'A'.

Seven of the 16 companies (BA3, ES6, GR7, ST13, TR14, WG15, WI16) indicated that ongoing training is taking place as and when required in terms of environmental matters, however, there was no specific mention of training relating to water sustainability measures. These companies were given a score of 'C'.

5. **Is data collected and monitored on external factors affecting their water source?**

Ten of the 16 companies (AF1, BR4, CO5, MA8, MU9, RA11, SE12, TR14, WG15, WI16) provided no disclosure relating to data about external factors that could affect direct water sources being collected or monitored. These companies were given a score of 'D'.

Six of 16 companies (AV2, BA3, ES6, GR7, PP10, ST13) only mentioned a few external factors, such as global climate change, droughts and the government's lack of commitment, which have affected the availability and quality of water and a wide range of factors have not been tracked, which could affect the supply of water. There is no evidence of active collection and monitoring of data pertaining to external factors. Esor Limited raised concerns about the lack of commitment by government's water infrastructure development, with severe delays in implementing central government policy and large-scale infrastructure projects such as the raising of the Clanwilliam dam wall and the design and construct of the bulk raw water project in Limpopo, Olifants River Phase 2D that have not proceeded as planned. PPC Limited mentioned climate change and extreme weather conditions as external factors affecting its availability and quality of water. Stefanutti Stocks mentioned water restrictions by the Cape Town Municipal as the external factor affecting their direct water source. These companies were given a score of 'C'.

6. **Does the company monitor and manage regulatory compliance relating to water consumption and discharge?**

Three of the 16 companies (BR4, CO5, TR14) show no evidence of monitoring or management of regulatory compliance with either consumption, withdrawal or discharge of water within their facilities. These companies received a score of 'D'.

Seven of the 16 companies (AF1, MU9, PP10, RA11, SE12, ST13, WI16) included compliance related to water consumption and usage as one of the key performance indicators or focus areas and these indicators have been monitored by the relevant subcommittees responsible for environmental issues. Non-compliance is being highlighted and recommendations have been put forward, which are being addressed. However, none of the companies in this sector disclosed their compliance relating to the discharge of water. These companies were, therefore, given a score of 'B'. Murray and Roberts mentioned that their operations comply with ISO 14001, which is an international standard for environmental management systems. This includes the management of environmental issues such as water consumption.

Six of the 16 companies (AV2, BA3, ES6, GR7, MA8, WG15) included compliance disclosure relating to environmental issues, however, no such discussion included compliance with regards to consumption, withdrawal or discharge. PPC limited mentioned that they are committed to environmental compliance based on sound environmental management, which is reviewed on a regular basis. These companies received a score of 'C'

7. **Does the company collect and monitor data on stakeholder concerns and perceptions?**

Consolidated Infrastructure Group provided no disclosures relating to its interaction with any stakeholders. No evidence was provided to prove that it has any collection and monitoring mechanisms in place with regards to stakeholders' perceptions and concerns. This company received a score of 'D'.

Fifteen of the 16 companies engage and monitor the concerns of a variety of their stakeholders, which include customers, suppliers, governments and the community. Regular meetings are held with the relevant stakeholders to determine their concerns and thereafter, measures are in place to attend to their concerns.

Murray and Roberts mentioned that retention of their stakeholders' trust is critical to success and they interact with a variety of stakeholders across the globe. They tabulated their interactions, which included their relationship with the stakeholder, the engagement process

and the main concerns derived from the interactions. These companies, therefore, received a score of 'A'.

8. **Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?**

None of the 16 companies provided disclosures of their engagement with their suppliers in relation to water sustainability risks.

4.4 INDUSTRIAL METALS AND MINING SECTOR

Water is used for raw material extraction, as well as transport and storage of surplus slurry in the mining sector. A significant risk is water pollution (CDP, 2018). Mines are required to effectively remove and dispose of this groundwater to acquire the minerals underneath the water table. A significant risk is acid mine drainage (AMD), as well as water pollution from tailings dams. It also poses to be a risk after the lifetime of a mine. The processing of minerals requires large amounts of energy and in order to produce this energy, water is required (CDP, 2018).

The industrial metals and mining sector includes the following 26 companies:

1) African Rainbow Minerals (AF1), **2)** Andulela Investment Holdings (AN2), **3)** Anglo American Platinum (AN3), **4)** Anglo Gold Ashanti (AN4), **5)** Arcelomital SA (AR5), **6)** Assore (AS6), **7)** Bauba Platinum (BA7), **8)** BSI Steel (BS8), **9)** Crometco (CR9), **10)** DRD Gold (DR10), **11)** Goldfields (GO11), **12)** Harmony Gold Mining (HA12), **13)** Hulamin (HU13), **14)** Impala Platinum (IM14), **15)** Kumba Iron Ore (KU15), **16)** Marafe Resources (MA16), **17)** Master drilling (MA17), **18)** Northam Platinum (No18), **19)** Pan African Resources (PA19), **20)** Rand Gold Exploration (RA20), **21)** Royal Bafokeng Platinum (RO21), **22)** Sibanye Stillwater (SI22), **23)** Transhex Group (TR23), **24)** Union Atlantic Minerals (UN24), **25)** Wesizwe Platinum (WE25).

Table 4. 8 Analysis of companies 1 - 12 in the Industrial Metal and Mining sector – Category 1: Disclosure

Company number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. Disclosure												

1. Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the frameworks such as the Global reporting initiatives, water disclosure project, Ceres Aqua Gauge, International integrated reporting council?	B	C	B	B	B	B	C	C	C	B	B	B
2. Does the company include water information as part of its published financial reports?	D	D	D	D	D	D	D	D	D	B	D	C
3. Does the company show evidence of water disclosures that have been audited by external auditors?	A	D	A	C	D	C	D	D	D	A	D	A

Table 4. 9 Analysis of companies 1 - 12 in the industrial metal and mining sector – Category 2: Level of Management involvement

2. Levels of management involved	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. How involved are senior executives in managing water sustainability risks?	C	C	C	C	C	C	C	C	C	C	C	C
2. What role does the board play with regards to oversight of water sustainability?	C	C	C	C	C	C	C	C	C	C	C	C
3. Does management take into consideration water in their investment decision making or business planning?	B	D	A	B	B	A	D	D	B	A	B	A
4. Has management set itself performance goals or standards on their consumption of water?	A	D	A	B	D	A	D	D	D	B	B	A
5. Has management set itself performance goals or standards on their wastewater discharged into the environment?	A	D	A	D	D	A	D	D	D	D	A	A
6. Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent?	A	D	A	D	D	A	D	D	D	A	D	A
7. Does management have a water policy in place which recognises the importance that water is to the organisation?	A	A	A	A	A	D	D	D	D	D	A	A

Table 4. 10 Analysis of companies 1 - 12 in the industrial metal and mining sector – Category 3: Performance management system

3. Performance Management System	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. Has the company identified water risks as part of its operation?	A	D	A	C	A	A	D	D	D	C	A	C
2. Has the company provided the total water withdrawal/consumption from all sources?	A	D	A	A	C	C	D	D	D	A	C	A
3. Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water?	A	D	A	A	D	A	D	D	D	A	D	A
4. Does the company provide training to staff relating to water usage?	A	C	C	C	C	C	C	C	C	C	C	C
5. Is data collected and monitored on external factors affecting their water source?	C	D	C	C	C	D	D	D	D	C	C	C

6. Does the company monitor and manage regulatory compliance relating to water consumption and discharge?	A	D	A	A	A	A	D	D	D	A	B	A
7. Does the company collect and monitor data on stakeholder concerns and perceptions?	A	A	A	A	A	A	A	A	A	A	A	A
8. Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?	D	D	B	D	D	D	D	D	D	D	D	D

Table 4. 11 Analysis of companies 13 - 25 in the industrial metal and mining sector – Category 1: Disclosure

Company number	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
1. Disclosure													
1. Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the frameworks such as the Global reporting initiatives, water disclosure project, Ceres Aqua Gauge, International integrated reporting council?	B	B	B	B	C	B	C	C	B	B	C	D	B
2. Does the company include water information as part of its published financial reports?	D	D	D	D	D	D	D	D	C	D	D	D	D
3. Does the company show evidence of water disclosures that have been audited by external auditors?	A	A	A	A	C	A	D	D	A	C	A	D	C

Table 4. 12 Analysis of companies 13 - 25 in the industrial metal and mining sector – Category 2: Level of management involvement

2. Levels of management involved	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
1. How involved are senior executives in managing water sustainability risks?	C	C	C	C	C	C	C	C	C	C	C	C	C
2. What role does the board play with regards to oversight of water sustainability?	C	C	C	C	C	C	C	C	C	C	C	C	C
3. Does management take into consideration water in their investment decision making or business planning?	A	B	A	A	D	A	A	D	B	B	B	D	B
4. Has management set itself performance goals or standards on their consumption of water?	A	B	A	B	D	B	D	D	B	B	D	D	B
5. Has management set itself performance goals or standards on their wastewater discharged into the environment?	D	D	A	D	D	A	D	D	D	A	D	D	A
6. Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent?	D	D	A	D	D	A	A	D	A	A	D	D	A

2. Levels of management involved	13	14	15	16	17	18	19	20	21	22	23	24	25
7. Does management have a water policy in place which recognises the importance that water is to the organisation?	D	A	A	A	D	A	A	D	A	D	A	D	A

Table 4. 13 Analysis of companies 13 - 25 in the industrial metal and mining sector – Category 3: Performance management system

3. Performance Management system	13	14	15	16	17	18	19	20	21	22	23	24	25
1. Has the company identified water risks as part of its operation?	C	C	A	A	D	C	C	D	C	A	D	D	D
2. Has the company provided the total water withdrawal/consumption from all sources?	C	A	A	C	D	A	C	D	A	A	D	D	A
3. Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water?	D	D	A	D	D	A	D	D	D	A	D	D	A
4. Does the company provide training to staff relating to water usage?	C	C	C	C	C	C	C	C	C	C	C	C	C
5. Is data collected and monitored on external factors affecting their water source	C	C	C	C	D	C	C	D	C	C	D	D	C
6. Does the company monitor and manage regulatory compliance relating to water consumption and discharge?	A	B	A	B	D	A	B	D	B	A	D	D	A
7. Does the company collect and monitor data on stakeholder concerns and perceptions?	A	A	A	A	A	A	A	A	A	A	A	A	A
8. Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?	D	D	A	D	D	D	D	D	D	D	D	D	D

Category 1: Disclosure

1. **Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the reporting initiatives such as the Global Reporting Initiatives, Water Disclosure Project, Ceres Aqua Gauge, International Integrated Reporting Council?**

Union Atlantic Minerals provided no disclosures relating to water sustainability in line with reporting initiatives, therefore, received a score of 'D'.

Eight of the 25 companies (AN2, BA7, BS8, CR9, MA17, PA19, RA20, TR23) provided limited disclosures relating to the level of management involvement, measurement of water

consumption and effluent discharge, monitoring of compliance requirements, setting of performance standards and goals and the collection and monitoring of external data affecting direct sources. These companies were, therefore, given a score of 'C'.

Sixteen of the 25 companies (AF1, AN3, AN4, AR5, AS6, DR10, GO11, HA12, HU13, IM14, KU15, MA16, No18, RO21, SI22, WE25) made good progress by providing specific details relating to water sustainability; however, there were still gaps in the approach in terms of disclosing their water measurements, senior executives who were involved in the process and the engagement with its suppliers with regards to water sustainability. A score of 'B' was given. Anglo American Platinum and Kumba Iron Ore mentioned that they want to improve on supply chain environmental risks and have set out their expectations with regards to current and prospective suppliers. No company received a score of 'A' as each company was lacking a specific disclosure criterion in relation to water sustainability measures.

2. **Does the company include water information as part of its published financial reports?**

DRD Gold, Harmony Gold Mining and Royal Bafokeng Platinum were the only three companies to disclose water information as part of their published financial reports. DRD Gold mentioned that they realised benefits from the investments made in financial capital and this included increased production and cost saving benefits. Their investment in the centralised water management plan has enabled them to save more than R21 million a year. DRD Gold, therefore, received a score of 'B'. Harmony Gold Mining and Royal Bafokeng Platinum indicated their cost saving from a reduction in water consumption. These two companies received a score of 'C'.

The remaining 22 companies (AF1, AN2, AN3, AN4, AR5, AS6, BA7, BS8, CR9, GO11, HU13, IM14, KU15, MA16, MA17, No18, PA19, RA20, SI22, TR23, UN24, WE25) were given a score of 'D' as they did not provide any water disclosures as part of their published financial reports including the notes to the financial statements. There was no integrative discussion of water risks together with financial performance data in the annual reports.

3. **Does the company show evidence of water disclosures that have been audited by external auditors?**

Eleven out of the 25 companies (AF1, AN3, DR10, HA12, HU13, IM14, KU15, MA16, No18, RO21, SI22) showed evidence of non-financial disclosures being audited mentioned the independent environmental audits that measure the environmental impact and compliance were performed and indicated the type of audit performed, as well as the company performing the audit. These companies received a score of 'A'.

Five of the 25 companies (AN4, AS6, MA17, SI22, WE25) mentioned that environmental audits are taking place, however, no specific details were provided in relation to whether the environmental audits included aspects of water sustainability. These five companies, therefore, received a score of 'C'.

The remaining nine companies (AN2, AR5, BA7, BS8, CR9, GO11, PA19, RA20, UN24) provided no evidence of water disclosures being audited by an independent third party; therefore, a score of 'D' was given.

Category 2: Levels of management involved

1. **How involved are senior executives in managing water sustainability risks?**

All 25 companies provided limited information about senior executive involvement. The CEO or chairman reports mentioned their commitment to the responsible usage of water and the initiatives that the company is involved in with regards to water sustainability. Sub-committees, which include senior executives as key members are in place, however, no further details of executive involvement were provided. There are no clear lines of responsibility and there is no mention of it in the integrated reports with regards to incentive compensation relating directly to water sustainability achievements for senior executives. These 25 companies were, therefore, given a score of 'C'.

2. **What role does the board play with regards to oversight of water sustainability?**

All 25 companies had sub-committees such as a social and ethics committee, which was responsible for water sustainability and required to report to the board. However, limited details were provided regarding how often the board is briefed, specifically on water sustainability risks and how explicit the oversight was. Therefore, these four companies received a score of 'C'.

3. **Does management take into consideration water in their investment decision making or business planning?**

Nine of the 25 companies (AN3, AS6, DR10, HA12, HU13, KU15, MA16, No18, PA19) adequately disclosed their investment decisions and planning relating to water sustainability. These nine companies received a score of 'A'.

Ten of the 25 companies (AF1, AN4, AR5, CR9, GO11, IM14, RO21, SI22, TR23, WE25) merely mentioned that they considered sustainable development and that they implemented various initiatives to reduce the wastage of water; however, no further details were provided. These 10 companies received a score of 'B'.

Six of the 25 companies (AN2, BA7, BS8, MA17, RA20, UN24) provided no disclosure with regards to consideration of water in business planning, investment decision making and development. These 6 companies received a score of 'D'

4. **Has management set itself performance goals or standards on their consumption of water?**

Six of the 25 companies (AF1, AN3, AS6, HA12, HU13, KU15) have set operation-specific water intensity and site-specific targets or aggressive performance targets to water stress facilities. These companies received a score of 'A'

Nine out of 25 companies (AN4, DR10, GO11, IM14, MA16, No18, RO21, SI22, WE25) have set performance targets relating to water consumption across their facilities. However, no aggressive performance target was set for water stress facilities or areas of the business that consume greater amounts of water. A score of 'B' was given for these companies.

Ten out of 25 companies (AN2, AR5, BA7, BS8, CR9, MA17, PA19, RA20, TR23, UN24) provided no evidence of performance standards and goals in place with regards to the reduction in water withdrawal or consumption at its facilities. A score of 'D' was given.

5. **Has management set itself performance goals or standards on their wastewater discharged into the environment?**

Nine out of 25 companies (AF1, AN3, AS6, GO11, HA12, KU15, No18, SI22, WE25) have performance standards set on wastewater discharge. African Rainbow Minerals set a goal to

recycle 100% of the waste water and to have no discharges. Harmony Gold also has a zero-discharge aspiration. These eight companies, therefore, received a score of 'A'.

The remaining 16 companies (AN2, AN4, AR5, BA7, BS8, CR9, DR10, HU13, IM14, MA16, MA17, PA19, RA20, RO21, TR23, UN24) had not set performance standards relating to wastewater discharge in their integrated reports; furthermore, there was no mention of wastewater compliance being met by these companies. A score of 'D' was given

6. **Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent?**

Eleven out of 25 companies (AF1, AN3, AS6, DR10, HA12, KU15, No18, PA19, RO21, SI22, WE25) provided descriptions of minimum standards set for effluent discharge. Kumba Iron Ore mentioned that they monitor the quality of their water discharged. Quarterly and monthly reports are being conducted by an independent service provider. The DRD Gold wastewater treatment works was designed to provide them with 10M**l** of recycled water a day for use in reclamation activities. Rondebult, which supports a bird sanctuary in its maturation ponds, has been accredited as a "Green Drop" facility by the Department of Water and Sanitation (DWS) as it upholds the highest standards in wastewater discharge. The pump station and plant extracts and treats AMD water to a non-potable standard before releasing it into the environment. These 11 companies received a score of 'A'.

The remaining 14 companies (AN2, AN4, AR5, BA7, BS8, CR9, GO11, HU13, IM14, MA16, MA17, RA20, TR23, UN24) provided no descriptions of standards for the discharge of their effluent. These companies, therefore, received a score of 'D'.

7. **Does management have a water policy in place which recognises the importance that water is to the organisation?**

Fifteen out of the 25 companies (AF1, AN2, AN3, AN4, AR5, GO11, HA12, IM14, KU15, MA16, No18, PA19, RO21, TR23, WE25) either have a water policy in place or have an overall environmental policy that sets out clear goals and guidelines that include action required with regards to water sustainability. This policy is publicly available and the company has shown its commitment to water. These companies were given a score of 'A'

Ten of the 25 companies (AS6, BA7, BS8, CR9, DR10, HU13, MA17, RA20, SI22, UN24) did not disclose that they have any policy in place that included goals and guidelines relating to the usage of water. These companies were given a score of 'D'

Category 3: Identification/Measurement/Management processes

1. **Has the company identified water risks as part of its operation?**

Eight of the 25 companies (AF1, AR5, AS6, GO11, KU15, MA16, SI22) identified water-related risks, including plans to mitigate these risks in the long term. Anglo American platinum mentioned that water is a principal risk as all their operations are located in areas where water is scarce. These companies received a score of 'A'.

Eight of the 25 companies (AN4, DR10, HA12, HU13, IM14, No18, PA19, RO21) mentioned that they follow a risk-based approach to environmental management and identified water scarcity as a risk. These companies received a score of 'C'.

Nine of the 25 companies (AN2, BA7, BS8, CR9, MA17, RA20, TR23, UN24, WE25) did not identify water risks as part of their operation, therefore, received a score of 'D'

2. **Has the company provided the total water withdrawal/consumption to all sources?**

Eight of the 25 companies (AN2, BA7, BS8, CR9, MA17, RA20, TR23, UN24) provided no disclosures relating to their water withdrawal or consumption to all sources. These companies, therefore, received a score of 'D'. Six of the 25 companies (AR5, AS6, GO11, HU13, MA16, PA19) mentioned their consumption of water; however, did not mention the sources of the water. They were given a score of 'C'.

Eleven out of the 25 companies (AF1, AN3, AN4, DR10, HA12, IM14, KU15, No18, RO21, SI22, WE25) adequately disclosed their water consumption figures with regards to all direct sources such as municipal, borehole and river water. These companies received a score of 'A'.

3. **Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water?**

Ten of the 25 companies (AF1, AN3, AN4, AS6, DR10, HA12, KU15, No18, SI22, WE25) discharge their wastewater via a third-party contractor who responsibly disposes of it or has declared a zero-water discharge. These 10 companies, therefore, received a score of 'A'.

The remaining 15 companies (AN2, AR5, BA7, BS8, CR9, GO11, HU13, IM14, MA16, MA17, PA19, RA20, RO21, TR23, UN24) had not provided disclosures relating to total water discharge figures to areas per destination, therefore, a score of 'D' was given.

4. **Does the company provide training to staff relating to water usage?**

African Rainbow Minerals conduct annual climate change and water forums at each of its operations. African Rainbow Minerals, therefore, received a score of 'A'.

The remaining 24 companies indicated that ongoing scheduled training is taking place as and when required in terms of environmental matters, however, there is no specific mention of training relating to water sustainability measures. These companies were given a score of 'C'.

5. **Is data collected and monitored on external factors affecting their water source?**

16 of the 25 companies (AF1, AN3, AN4, AR5, DR10, GO11, HA12, HU13, IM14, KU15, MA16, No18, PA19, RO21, SI22, WE25) only mentioned a few external factors such as global climate change, water availability, changes in productivity and social challenges. There is no evidence of active collection and monitoring of data pertaining to these external factors. These companies were given a score of 'C'.

Nine of the 25 companies (AN2, AS6, BA7, BS8, CR9, MA17, RA20, TR23, UN24) provided no disclosure relating to data being collected or monitored about external factors that could affect direct water sources. These companies were given a score of 'D'.

6. **Does the company monitor and manage regulatory compliance relating to water consumption and discharge?**

Five of the 25 companies (GO11, IM14, MA16, PA19, RO21) are managing and monitoring their compliance disclosure in relation to water sustainability in the form of key performance indicators, which are being reported on a monthly or yearly basis. These companies provided discussions relating to their monitoring and management of water sustainability and stated the number of non-compliance areas, if any. The focus of these companies is on water consumption whilst no monitoring and management relating to water discharge was provided. Good progress was acknowledged amongst these companies, therefore, a score of 'B' was given.

Twelve out of the 25 companies (AF1, AN3, AN4, AR5, AS6, DR10, HA12, HU13, KU15, No18, SI22, WE25) provided detailed disclosures relating to their monitoring and management of regulatory compliance relating to water usage and discharge. These companies focused on water consumption, as well as the effluent discharge, which they release into the environment. Some of these companies have also put measures in place to ensure that there is zero discharge into the environment. These companies, therefore, received a score of 'A'.

Eight of the 25 companies (AN2, BA7, BS8, CR9, HA12, HU13, No18, SI22) provided no disclosure relating to their monitoring and management of their regulatory compliance in terms of water usage and discharge. These companies received a score of 'D'.

7. **Does the company collect and monitor data on stakeholder concerns and perceptions?**

All 25 companies mentioned that they engaged with stakeholders regarding their concerns. This includes regular meetings with stakeholders that are impacted by the company. However, there are no details as to whether these interactions with stakeholders include water sustainability matters. A score of 'A' was given for these companies.

8. **Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?**

Anglo American Platinum made mention of their commitment to work with suppliers whilst not harming the environment or people. Kumba Iron Ore also set out their requirements for current and prospective suppliers in terms of sustainability. However, water-related issues were not disclosed. These two companies, therefore, received a score of 'B'.

23 of the 25 companies (AF1, AN2, AN4, AR5, AS6, BA7, BS8, CR9, DR10, GO11, HA12 HU13, IM14, MA16, MA17, No18, PA19, RA20, RO21, SI22, TR23, UN24, WE25) provided no disclosures of their engagement with their suppliers in relation to water sustainability risks.

4.5 OIL AND GAS SECTOR

Water is part of most of the value processes such as pumping, drilling, treatment and cooling. Fuel production and the generation of power are projected to increase water usage to 135 billion cubic meters by 2035 from 66 billion cubic meters in 2010 (CDP, 2018). Half of this growth in water usage is due to coal, which has been regarded as the method that uses the highest

amount of water to generate electricity. Great amounts of water will be used for extraction if production techniques such as oil sands or hydraulic fracturing are used. Water pollution is the major risk that can arise from spillage, water discharge causing pollution of surface water and groundwater and leaking pumps in transportation (CDP, 2018).

The oil and gas production sector includes the following six companies:

1) Efora Energy (EF1), **2)** Exxaro Resources (EX2), **3)** Keaton Energy Holdings (Wescoal) (KE3), **4)** MCMining (MC4), **5)** Sasol (SA5), **6)** Sentula Mining (Unicorn) (SE6)

Table 4. 14 Analysis of companies 1 - 6 in the oil and gas sector – Category 1: Disclosure

Company number	**1**	**2**	**3**	**4**	**5**	**6**
1. Disclosure						
1. Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the frameworks such as the Global reporting initiatives, water disclosure project, Ceres Aqua Gauge, International integrated reporting council?	B	B	C	B	B	C
2. Does the company include water information as part of its published financial reports?	C	D	D	D	D	D
3. Does the company show evidence of water disclosures that have been audited by external auditors?	A	A	A	A	A	D

Table 4. 15 Analysis of companies 1 - 6 in the oil and gas sector – Category 2: Level of Management involvement

2. Levels of management involved	**1**	**2**	**3**	**4**	**5**	**6**
1. How involved are senior executives in managing water sustainability risks?	C	C	C	C	C	C
2. What role does the board play with regards to oversight of water sustainability?	C	B	C	B	C	C
3. Does management take into consideration water in their investment decision making or business planning?	A	B	B	B	A	D
4. Has management set itself performance goals or standards on their consumption of water?	B	A	B	C	A	D
5. Has management set itself performance goals or standards on their wastewater discharged into the environment?	D	D	D	A	D	D
6. Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent?	D	D	D	A	D	D
7. Does management have a water policy in place which recognises the importance that water is to the organisation?	A	A	C	D	A	D

Table 4. 16 Analysis of companies 1 - 6 in the oil and gas sector – Category 3: Performance management system

3. Performance Management System	**1**	**2**	**3**	**4**	**5**	**6**

1. Has the company identified water risks as part of its operation?	B	B	B	C	A	D
2. Has the company provided the total water withdrawal/consumption from all sources?	A	B	D	A	A	D
3. Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water?	A	D	D	A	B	D
4. Does the company provide training to staff relating to water usage?	C	C	C	C	C	C
5. Is data collected and monitored on external factors affecting their water source?	D	C	D	C	C	D
6. Does the company monitor and manage regulatory compliance relating to water consumption and discharge?	B	B	A	B	B	C
7. Does the company collect and monitor data on stakeholder concerns and perceptions?	A	A	A	A	A	A
8. Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?	D	D	D	D	C	D

Category 1: Disclosure

1. **Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the reporting initiatives such as the Global Reporting Initiatives, Water Disclosure Project, Ceres Aqua Gauge, International Integrated Reporting Council?**

Keaton Energy Holdings and Sentula Mining provided limited disclosures relating to the level of management involvement, measurement of water consumption and effluent discharge, monitoring of compliance requirements, setting of performance standards and goals and the collection and monitoring of external data affecting direct sources. These two companies were, therefore, given a score of 'C'.

Four of the six companies (EF1, EX2, MC4, SA5) made good progress by providing specific details relating to water sustainability; however, there were still gaps in the approach in terms of disclosing their water measurements, senior executives that are involved in the process and their engagement with suppliers with regards to water sustainability. A score of 'B' was given. No company received a score of 'A', as each company was lacking a specific disclosure criterion in relation to water sustainability measures. Sasol was the only company that made mention that they want to improve on supply chain water risks. They also indicated that they have enhanced their monitoring of suppliers.

2. **Does the company include water information as part of its published financial reports?**

Efora Energy was the only company in the sector to report on water information as part of its published financial reports. They mentioned that they incurred a loss of 16.1 million as a result of production and operational issues relating to high water content. Efora Energy received a score of 'C'.

The remaining five companies (EX2, KE3, MC4, SA5, SE6) were given a score of 'D' as they have not provided any water disclosures as part of their published financial reports, including the notes to the financial statements. There were no integrative discussions of water risks together with financial performance data in the annual reports.

3. **Does the company show evidence of water disclosures that have been audited by external auditors?**

Five of the six companies (EF1, EX2, KE3, MC4, SA5) showed evidence of non-financial disclosures being audited or mentioned that independent environmental audits, which measure the environmental impact and compliance, were performed. These companies received a score of 'A'. Efora Energy mentioned that Grant Thornton performed the audit on their group.

Unicorn was the only company that provided no evidence of water disclosures being audited by an independent third party, therefore, a score of 'D' was given.

Category 2: Levels of management involved

1. **How involved are senior executives in managing water sustainability risks?**

All six companies provided limited information about senior executive involvement. The CEO or chairman reports mentioned their commitment to the responsible usage of water and the initiatives that the company is involved in with regards to water sustainability. Sub-committees are in place, which include senior executives as key members; however, no further details of executive involvement were provided. There are no clear lines of responsibility and there is no mention in the integrated reports of incentive compensation for senior executives relating directly to water sustainability achievements. These six companies were, therefore, given a score of 'C'.

2. **What role does the board play with regards to oversight of water sustainability?**

Four of the six companies (EF1, KE3, SA5, SE6) had a sub-committee such as a social and ethics committee, which was responsible for water sustainability and required to report to the board. However, limited details were provided regarding how often the board is briefed, specifically on water sustainability risks and how explicit is the oversight. Therefore, these four companies received a score of 'C'.

Two of the six companies (EX2, MC4) had sub-committees in place and mentioned sustainability measures as part of their group water strategy. The board of these companies disclosed their seriousness with regards to monitoring and compliance in relation to water sustainability. These two companies received a score of 'B'.

3. **Does management take into consideration water in their investment decision making or business planning?**

Two of the six companies (EF1, SA5) disclosed their investment decisions and planning relating to water sustainability. Sasol made mention that their product stewardship approach involves identifying opportunities in enhanced product design, technology and digitalisation. They investigate alternative water- and energy-supply technologies to support their operations. They also develop and invest in technologies to treat, reuse and recycle water from their operations to reduce demand and exposure to water-related risks to minimise the ecological impact. Efora Energy also disclosed their investment decisions which involves isolation of production from target reservoirs. These two companies received a score of 'A'.

Three of the six companies (EX2, KE3, MC4) merely mentioned they consider sustainable development and that they implemented various initiatives to reduce wastage of water, however, no further details were provided. These three companies received a score of 'B'.

Unicorn did not provide disclosure with regards to consideration of water in business planning, investment decision making and development.

4. **Has management set itself performance goals or standards on their consumption of water?**

Unicorn provided no evidence of performance standards and goals in place with regards to the reduction in water withdrawal or consumption at its facilities. A score of 'D' was given. Efora Energy and Keaton Energy have set performance targets relating to water consumption across

their facilities. However, there was no aggressive performance target set for water stress facilities or areas of the business that consume greater amounts of water. A score of 'B' was, therefore, given for these companies. MCMining had set performance targets, however, this was not specifically related to water consumption.

Exxaro Resources and SASOL have set operation-specific water intensity and site-specific targets. These companies received a score of 'A'.

5. **Has management set itself performance goals or standards on their wastewater discharged into the environment?**

Five of the six companies (EF1, EX2, KE3, SA5, SE6) did not set performance standards relating to wastewater discharge in their integrated reports; furthermore, there was no mention of wastewater compliance being met by these companies. These companies received a score of 'D'

MCMining has a zero discharge as they operate using a closed water system. their operations strive, through the implementation of continued improvement projects, to reduce water consumption by increasing the use of wastewater in the processing of coal. McMining, therefore, received a score of 'A'.

6. **Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent?**

MCMining received a score of 'A' due to their operation of a closed water system. The remaining five companies (EF1, EX2, KE3, SA5, SE6) provided no descriptions of standards for the discharge of their effluent. These companies, therefore, received a score of 'D'.

7. **Does management have a water policy in place which recognises the importance that water is to the organisation?**

Three of the six companies (EF1, EX2, SA5) either have a water policy in place or have an overall environmental policy that sets out clear goals and guidelines that include action required with regards to water sustainability. This policy is publicly available and the company has shown its commitment to water. Therefore, these companies were given a score of 'A' as achievement of criteria has been met. Keaton Energy mentioned that it is in the process of

developing environmental policies with specific reference to minimising impact potential from their operations. Keaton received a score of 'C' as they are beginning the process.

Two of the six companies (MC4, SE6) did not disclose that they have any policies in place that included goals and guidelines relating to the usage of water.

Category 3: Identification/Measurement/Management processes

1. **Has the company identified water risks as part of its operation?**

Sasol assesses water risks through their global enterprise risk management process. Sasol mentioned that their water supply remains secure but due to an increasing imbalance of supply and demand, there is an increase in supply risk as a result of water restrictions, which can be imposed. Current and long-term plans are put in place in order to mitigate the risk. Sasol received a score of 'A'.

Three of the six companies (EF1, EX2, KE3) discussed their risk, as well as plans to mitigate these risks; however, risks in specific direct operations were not disclosed. These three companies, therefore, received a score of 'B'.

MCMining merely mentioned that they follow a risk-based approach to environmental management. A score of 'C' was given to them.

2. **Has the company provided the total water withdrawal/consumption to all sources?**

Two of the six companies (KE3, SE6) provided no disclosures relating to their water withdrawal or consumption to all sources. These companies, therefore, received a score of 'D'. Exxaro Resources mentioned their consumption of water; however, they did not mention the sources of the water. They were given a score of 'B'.

Three of the six companies (EF1, MC4, SA5) adequately disclosed their water consumption figures with regards to all direct sources such as municipal, borehole and river water. These companies received a score of 'A'.

3. **Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water?**

Efora Energy discharged its wastewater via a third-party contractor who responsibly disposes of it whilst MCMining has zero water discharge. These companies, therefore, received a score of 'A'. Sasol provided a discharge figure but not per source, therefore, received a score of 'C'.

The remaining three companies (EX2, KE3, SE6) did not provide disclosures relating to water discharge to areas per destination, therefore, a score of 'D' was given.

4. **Does the company provide training to staff relating to water usage?**

All six companies indicated that ongoing scheduled training takes place as and when required in terms of environmental matters; however, there was no specific mention of training relating to water sustainability measures. These companies were given a score of 'C'.

5. **Is data collected and monitored on external factors affecting their water source?**

Three of the six companies (EF1, KE3, SE6) provided no disclosure relating to data about external factors that could affect direct water sources being collected or monitored. These companies were, therefore, given a score of 'D'.

Three of the six companies (EX2, MC4, SA5) mentioned only a few external factors such as global climate change, water availability, changes in productivity and social challenges. There was no evidence of active collection and monitoring of data pertaining to these external factors. These companies were given a score of 'C'.

6. **Does the company monitor and manage regulatory compliance relating to water consumption and discharge?**

Unicorn included compliance disclosure relating to environmental issues or mentioned that no non-compliance had been noted with regards to the environmental regulations; however, no such discussion included compliance with regards to consumption, withdrawal or discharge. Unicorn is seen to be beginning the process of compliance disclosure and received a score of 'C'.

Four of the six companies (EF1, EX2, MC4, SA5) are managing and monitoring their compliance disclosure in relation to water sustainability in the form of key performance indicators, which are being reported on a monthly or yearly basis. These companies merely mention that they are monitoring and managing compliance with the regulations and state the

number of non-compliance areas, if any. However, they do not indicate which regulatory compliance requirements they are monitoring and managing. Also, the focus of these companies is on water consumption whilst no compliance relating to water discharge was provided. Good progress had been acknowledged amongst these companies, therefore, a score of 'B' was given.

Wescoal made mention that biological monitoring of potable water is conducted regularly. They had no water or liquid spills or contamination of water sources, except for an overflow of the pollution control dam at Elandspruit, which occurred during a flash flood and was reported to the DWS and corrective measures were applied. No environmental laws or regulations were transgressed, no fines were issued to Wescoal by the DWS and no water licences lapsed in the period under review. More focus will be placed on evaluating their water management practices at their existing mines and newly acquired assets to identify any high water-related risk areas and potential improvements. Due to the detail in their disclosure with regards to what regulatory compliance requirements they are monitoring and managing, Wescoal received a score of 'A'.

7. **Does the company collect and monitor data on stakeholder concerns and perceptions?**

All six companies mentioned that they engaged with stakeholders regarding their concerns. This includes regular meetings with stakeholders that are impacted by the company. However, there are no details as to whether these interactions with stakeholders include water sustainability matters. A score of 'A' was given for these companies.

8. **Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?**

Sasol was the only company that mentioned they want to improve on supply chain water risks. They also indicated that they have enhanced their monitoring of suppliers. Sasol, therefore, received a score of 'C', as they are beginning the process of engagement with suppliers.

The remaining five companies (EF1, EX2, KE3, MC4, SE6) provided no disclosures of their engagement with their suppliers in relation to water sustainability risks.

4.6 FOOD PRODUCTION SECTOR

Over 65% of the water in the world is consumed by the food production sectors as this sector requires water for crops to grow and animal feeding (CDP, 2018). Water also has many other uses such as packaging and transportation of agricultural produce. However, water quality can become an issue if pesticides and fertilisers are disproportionately applied as this can result in phosphorus and nitrate run-offs, which will pollute waterways and contaminate groundwater. Better water management is estimated to improve crop production by 20% globally (CDP, 2018).

The food production sectors include the following 15 companies:

1) AH-Vest (AH1), **2)** Astral Foods (AS2), **3)** AVI (AV3), **4)** Clover Industries (CL4), **5)** Crookes Brothers (CR5), **6)** Kaap Agri (KA6), **7)** Nutritional Holding (NU7), **8)** Oceana Group (OC8), **9)** Pioneer Food (PI9), **10)** Premier Food and Fishing (PR10), **11)** Quantum Food (QU11), **12)** RCL Food (RC12), **13)** Rhodes Foods (RH13), **14)** Tiger Brands (TI14), **15)** Tongaat Hulett (TO15).

Table 4. 17 Analysis of companies 1 - 11 in the food production sector – Category 1: Disclosure

Company number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1. Disclosure											
1. Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the frameworks such as the Global reporting initiatives, water disclosure project, Ceres Aqua Gauge, International integrated reporting council?	C	B	B	B	C	D	D	B	B	C	C
2. Does the company include water information as part of its published financial reports?	D	A	C	D	D	D	D	D	D	D	D
3. Does the company show evidence of water disclosures that have been audited by external auditors?	D	D	A	A	D	D	D	A	C	D	D

Table 4. 18 Analysis of companies 1 - 11 in the Food Production sector – Category 2: Level of Management involvement

2. Levels of management involved	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1. How involved are senior executives in managing water sustainability risks?	C	C	C	C	C	C	C	C	C	C	C
2. What role does the board play with regards to oversight of water sustainability?	C	C	C	C	C	C	C	C	B	C	C
3. Does management take into consideration water in their investment decision making or business planning?	A	A	A	A	A	D	D	A	A	C	C
4. Has management set itself performance goals or standards on their consumption of water?	D	B	B	D	D	D	D	B	B	D	B
5. Has management set itself performance goals or standards on their wastewater discharged into the environment?	D	B	A	D	D	D	D	B	D	D	D
6. Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent?	D	D	B	D	D	D	D	B	D	D	D
7. Does management have a water policy in place which recognises the importance that water is to the organisation?	D	A	A	D	A	D	D	A	D	D	D

Table 4. 19 Analysis of companies 1 - 11 in the Food Production sector – Category 3: Performance Management System

3. Performance Management System	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1. Has the company identified water risks as part of its operation?	C	A	A	D	C	D	D	C	A	C	A
2. Has the company provided the total water withdrawal/consumption from all sources?	D	A	A	C	D	D	D	C	A	D	C
3. Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water?	D	C	C	D	D	D	D	D	D	D	C
4. Does the company provide training to staff relating to water usage?	C	C	C	C	C	C	D	C	C	C	C
5. Is data collected and monitored on external factors affecting their water source?	C	B	B	C	C	D	D	D	C	C	C
6. Does the company monitor and manage regulatory compliance relating to water consumption and discharge?	C	C	C	C	C	C	C	C	B	B	B
7. Does the company collect and monitor data on stakeholder concerns and perceptions?	A	A	A	A	A	A	A	A	A	A	A
8. Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?	D	D	D	D	D	D	D	D	B	D	D

Table 4. 20 Analysis of companies 12 - 15 in the Food production sector – Category 1: Disclosure

Company number	**12**	**13**	**14**	**15**
1. Disclosure				

1. Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the reporting initiatives such as the Global reporting initiatives, water disclosure project, Ceres Aqua Gauge and International integrated reporting council?	B	B	B	B
2. Does the company include water information as part of its published financial reports?	D	D	C	D
3. Does the company show evidence of water disclosures that have been audited by external auditors?	D	D	A	A

Table 4. 21 Analysis of companies 12 - 15 in the food production sector – Category 2: Level of management involvement

2. Levels of management involved	**12**	**13**	**14**	**15**
1. How involved are senior executives in managing water sustainability risks?	C	C	C	C
2. What role does the board play with regards to oversight of water sustainability?	C	C	C	C
3. Does management take into consideration water in their investment decision making or business planning?	A	A	A	A
4. Has management set itself performance goals or standards on their consumption of water?	A	B	B	B
5. Has management set itself performance goals or standards on their wastewater discharged into the environment?	A	D	D	B
6. Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent?	D	D	D	B
7. Does management have a water policy in place which recognises the importance that water is to the organisation?	A	D	A	D

Table 4. 22 Analysis of companies 12 - 15 in the food production sector – Category 3: Performance management system

3. Performance Management System	**12**	**13**	**14**	**15**
1. Has the company identified water risks as part of its operation?	A	B	B	C
2. Has the company provided the total water withdrawal/consumption from all areas with water stress per source?	A	A	C	A
3. Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water?	C	D	D	D
4. Does the company provide training to staff relating to water usage?	C	C	C	C
5. Is data collected and monitored on external factors affecting their water source?	B	C	B	B
6. Does the company monitor and manage regulatory compliance relating to water consumption and discharge?	B	B	B	B
7. Does the company collect and monitor data on stakeholder concerns and perceptions?	A	A	A	A
8. Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?	D	D	D	D

Category 1: Disclosure

1. **Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the reporting initiatives such as the Global Reporting Initiatives, Water Disclosure Project, Ceres Aqua Gauge, International Integrated Reporting Council?**

Kaap Agri and Nutritional Holdings did not provide any information in their annual reports specifically relating to water sustainability, therefore, a score of 'D' was given. AH-Vest, Crookes Brothers, RCL Food and Rhodes Foods and Quantum Food provided limited disclosures relating to the level of management involvement, measurement of water consumption and discharge, monitoring of compliance requirements and the setting of performance standards and goals. These four companies were, therefore, given a score of 'C'.

Nine of the 15 companies (AS2, AV3, CL4, OC8, PI9, RC12, RH13, TI14, TO15) made good progress by providing specific details relating to water sustainability; however, there were still gaps in the approach in terms of disclosing their water measurements, senior executives who are involved in the process and the engagement with suppliers with regards to water sustainability. A score of 'B' was given. No company received a score of 'A' as each company was lacking a specific disclosure criterion in relation to water sustainability measures. Only Pioneer Foods made mention of their engagement with regards to their suppliers, however, details in terms of water aspects were not disclosed. The remaining 14 companies provided no disclosures on supplier engagements and assistance related to water sustainability

2. **Does the company include water information as part of its published financial reports?**

Astral Foods made mention of the impact that their water interruptions had on their operating profit. The impact on its poultry division was a decrease of 74.5% of its operating profit for the year. Astral Foods, therefore, received a score of 'A'. AVI Limited mentioned that they spent R23.3 million on water infrastructure at specific areas of its operations, whilst Tiger Brands included the rand values of their water usages, which provided some link between non-financial and financial performance disclosures. These two companies received a score of 'C'.

The remaining 12 companies (AH1, CL4, CR5, KA6, NU7, OC8, PI9, PR10, QU11, RC12, RH13, TO15) were given a score of 'D', as they did not provide any water disclosures as part of their published financial reports including the notes to the financial statements. There was

no integrative discussion of water risks together with financial performance data in the annual reports.

3. **Does the company show evidence of water disclosures that have been audited by external auditors?**

Five of the 15 companies (AV3, CL4, OC8, TI14, TO15) showed evidence of non-financial disclosures being audited or mentioned that independent environmental audits, which measure the environmental impact and compliance, were performed. These companies received a score of 'A'.

Pioneer Foods is beginning to implement the process as it mentioned that they are currently installing water meters in order to improve on their water audits. They were given a score of 'C'. Nine of the 15 companies (AH1, AS2, CR5, KA6, NU7, PR10, QU11, RC12, RH13) provided no evidence of water disclosures being audited; therefore, a score of 'D' was given.

Category 2: Levels of management involved

1. **How involved are senior executives in managing water sustainability risks?**

All 15 companies provided limited information about senior executive involvement. The CEO or chairman reports mentions their commitment to the responsible usage of water and the initiatives that the company is partaking in with regards to water sustainability. Sub-committees are in place, which include senior executives as key members; however, no further details of executive involvement were provided. There are no clear lines of responsibility and there is no incentive compensation for senior executives relating directly to water sustainability achievements. These 15 companies were, therefore, given a score of 'C'.

2. **What role does the board play with regards to oversight of water sustainability?**

All 15 companies had a sub-committee such as a social and ethics committee, which was responsible for water sustainability and required to report to the board. However, limited details were provided regarding how often the board is briefed on water sustainability risks and how explicit is the oversight. Therefore, the 15 companies received a score of 'C'.

3. **Does management take into consideration water in their investment decision making or business planning?**

Kaap Agri and Nutritional Holdings provided no evidence of considering water in business planning and investment decision making. These two companies received a score of 'B'. Premier Food and Fishing and Quantum Food merely made mention that they implemented various initiatives to reduce wastage of water, however, no further details were provided. These two companies received a score of 'C'.

The remaining 11 companies (AH1, AS2, AV3, CL4, CR5, OC8, PI9, RC12, RH13, TI14, TO15) disclosed their investment decisions and planning relating to water sustainability. Crooke Brothers mentioned that they were changing to a more efficient system called drip and pivot irrigation. AVI Limited mentioned that they have a large investment in potable water, as well as desalination processes, which will assist in making them less dependent on municipal water. These 11 companies were given a score of 'A'.

4. **Has management set itself performance goals or standards on their consumption of water?**

Six of the 15 companies (AH1, CL4, CR5, KA6, NU7, PR10) provided no evidence of performance standards and goals in place with regards to the reduction in water withdrawal or consumption at its facilities. A score of 'D' was given for these six companies. Eight of the 15 companies (AS2, AV3, OC8, PI9, QU11, RH13, TI14, TO15) have set performance targets relating to water consumption across their facilities. However, there was no aggressive performance target set for water stress facilities or areas of the business that consume a greater amount of water. A score of 'B' was, therefore, given for these companies.

RCL Foods set performance targets per area, such as a target of 50% reduction in water during the processing of chicken, by 2025. RCL Foods was given a score of 'A'.

5. **Has management set itself performance goals or standards on their wastewater discharged into the environment?**

Astral Foods included specific targets for wastewater and water recycling. Oceana Group also set specific targets for water consumption and management of water. However, no specific mechanisms were disclosed to achieve these targets. These two companies, therefore, received a score of 'B'.

AVI Limited made mentioned that by installing water recycling and treatment plants they intend to reclaim a major part of the wastewater. The managing of the effluent involves flocculation and removal of solids from the water, as well as a reduction of the demands for chemical oxygen. RCL Foods mentioned that they are performing well in their waste to value plant. In 2017 they completed the waste to energy project, which takes water from the effluent plant and produces electricity. These two companies were given a score of 'A'.

Ten of the 15 companies (AH1, CL4, CR5, KA6, NU7, PI9, PR10, QU11, RH13, TI14) have not set performance standards relating to wastewater discharge in their integrated reports; furthermore, there was no mention of wastewater compliance being met by these companies.

6. **Has the company provided descriptions of minimum standards that they have set with regards to discharge of effluent?**

AVI Limited disclosed an improvement in the quality of the effluent discharge in its operations. The discharge requirements are being met. AVI Limited indicated that there was no non-compliance. Oceana Limited stated their commitment to sustainable resource use and have set specific targets for water consumption and waste disposal across the group. Tongaat Hulett have also improved in their disclosure of the quality of effluent discharge. There was no description of minimum standards set by these companies; therefore, a score of 'B' was given for these three companies.

The remaining 12 companies (AH1, AS2, CL4, CR5, KA6, NU7, PI9, PR10, QU11, RC12, RH13, TI14) provided no descriptions of standards for the discharge of their effluent. These companies, therefore, received a score of 'D'.

7. **Does management have a water policy in place which recognises the importance that water is to the organisation?**

Six of the 15 companies (AS2, AV3, CR5, OC8, RC12, TI14) either have a water policy in place or have an overall environmental policy that sets out clear goals and guidelines that includes action required with regards to water sustainability. This policy is publicly available and the company has shown its commitment to water. Therefore, these companies were given a score of 'A', because achievement of criteria has been met.

The remaining 9 companies (AH1, CL4, KA6, NU7, PI9, PR10, QU11, RH13, TO15) did not disclose that they have any policy in place that included goals and guidelines relating to the usage of water.

Category 3: Identification/Measurement/Management processes

1. **Has the company identified water risks as part of its operation?**

Five out of 15 companies (AS2, AV3, PI9, QU11, RC12) discussed water risks per specific areas of operation where there is high risk. Current and long-term plans were in place in order to mitigate the risk and plans, such as improvement of the water infrastructure, were detailed. Astral foods indicated their focus area to be the Standerton facility, which they regarded as a high-risk area in terms of water supply. The five companies received a score of 'A'.

Rhodes Foods and Tiger Brands discussed their risk, as well as plans to mitigate these risks, however, risks in specific direct operation were not disclosed. These two companies, therefore, received a score of 'B'.

Five of the 15 companies (AH1, CR5, OC8, PR10, TO15) merely mentioned water shortages and inconsistency in the quality of water as a key risk. However, there were no discussions of tools being used to identify water risk areas or discussions of the long-term plans to mitigate water sustainability risks. Therefore, these companies received a score of 'C'.

The remaining three companies (CL4, KA6, NU7) provided no disclosures of water-related risks relating to their direct operations, therefore, they were given a score of 'D'.

2. **Has the company provided the total water withdrawal/consumption to all sources?**

Five of the 15 companies (AH1, CR5, KA6, NU7, PR10) provided no disclosures relating to their water withdrawal or consumption to all sources. These companies, therefore, received a score of 'D'. Four of the 15 companies (CL4, OC8, QU11, TI14) mentioned their consumption of water, however, did not mention the sources of the water. They were given a score of 'C'.

Six of the 15 companies (AS2, AV3, PI9, RC12, RH13, TO15) adequately disclosed their water consumption figures with regards to all direct sources of water such as municipal, borehole and river water. These companies received a score of 'A'.

3. **Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water?**

Eleven of the 15 companies (AH1, CL4, CR5, KA6, NU7, OC8, PI9, PR10, RH13, TI14, TO15) provided no disclosures relating to water discharge to areas per destination. The remaining four companies (AS2, AV3, QU11, RC12) provided disclosures of their water discharge; however, no discharge figures were disclosed per area of destination. These four companies received a score of 'C'.

4. **Does the company provide training to staff relating to water usage?**

Nutritional Holdings provided no disclosure relating to the training of staff relating to water usage or environmental issues in general. The remaining 14 companies indicated that ongoing scheduled training is taking place as and when required in terms of environmental matters, however, there was no specific mention of training relating to water sustainability measures. These companies were given a score of 'C'.

5. **Is data collected and monitored on external factors affecting their water source?**

Three of the 15 companies (KA6, NU7, OC8) did not provide disclosure relating to data about external factors that could affect direct water sources being collected or monitored. These companies were, therefore, given a score of 'D'.

Seven out of 15 companies (AH1, CL4, CR5, PI9, PR10, QU11, RH13) only mentioned a few external factors such as the reliability of water from municipal sources, global climate change and the Cape Town drought situation, which affected the availability and quality of water. There is no evidence of active collection and monitoring of data pertaining to these external factors. Rhodes Foods Limited mentioned their concern relating to the reliability of water from local authorities and the drought in Cape Town, which have affected their direct water sources. Crooke brothers indicated that the severe drought of the Western Cape and low dam levels that have affected their direct water sources, were their major concerns. These companies were given a score of 'C'.

Five of the 15 companies (AS2, AV3, RC12, TI14, TO15) mentioned external factors, as well as monitored data relating to these external factors. Tiger Brands indicated that farming in the

Western Cape is still reeling from the impact of the worst drought in decades. Water levels in the dams are being monitored. These companies were given a score of 'B'.

6. **Does the company monitor and manage regulatory compliance relating to water consumption and discharge?**

Eight of the 15 companies (AH1, AS2, AV3, CL4, CR5, KA6, NU7, OC8) included compliance disclosure relating to environmental issues or mentioned that no non-compliance has been noted with regards to the environmental regulations; however, no such discussion included compliance with regards to consumption, withdrawal or discharge. Some companies indicated how they reduced water consumption; however, there was no indication if compliance requirements were met. These companies were seen to be beginning the process of compliance disclosure and received a score of 'C'.

Seven of the 15 companies (PI9, PR10, QU11, RC12, RH13, TI14, TO15) are managing and monitoring their compliance disclosure in relation to water sustainability in the form of key performance indicators, which are being reported on a monthly or yearly basis. These companies merely mention that they are monitoring and managing compliance with the regulations and state the number of non-compliance areas, if any. However, they do not indicate the regulatory compliance requirements, which they are monitoring and managing and the focus of these companies is on water consumption whilst no compliance relating to water discharge was provided. Premier Foods and Fishing manage their regulatory compliance as part of their key focus areas, which include water saving plans. Good progress has been acknowledged amongst these companies, therefore, a score of 'B' was given.

7. **Does the company collect and monitor data on stakeholder concerns and perceptions?**

All 15 companies mentioned that they engage with stakeholders regarding their concerns. This includes regular meetings with stakeholders that are impacted by the company. However, there is no detail as to whether these interactions with stakeholders include water sustainability matters. A score of 'A' was given for these companies.

8. **Does the company engage with and assist its suppliers throughout the supply chain process on water-related issues?**

Pioneer Foods mentioned that due to the droughts and shortages of water, they have started a Water Crisis Committee to reduce risk through engagements with suppliers. Details of the engagements with suppliers and their assistance given to suppliers were not discussed. Pioneer Foods, therefore, received a score of 'C', as they are seen to be beginning the process of engagement with suppliers in terms of water sustainability risks.

The remaining 14 companies provided no disclosures of their engagements with their suppliers in relation to water sustainability risks. A score of 'D' was given

4.7 FINDINGS

The findings will be structured per category for all four sectors. The findings of the four sectors will be compared with each other for each of the three categories aligned to the research objectives. The total sample of companies for all four sectors is 62 JSE listed companies. From this, 26% belong to the construction sector, 24% are from the food production sector, the mining sector holds the biggest share of the sample, which is 40% and the oil and gas sector has the smallest share, being 10% of the companies.

4.7.1 Disclosure

This category focuses on whether the selected South African companies disclose their water sustainability-related information to their investors in their integrated reports and whether it is in line with the various reporting initiatives. This category also determines how they integrate water information as part of their published financial reports, as well as whether the water sustainability disclosures have been subjected to verification by independent third parties.

The content analysis of integrated reports of South African companies in the construction sector revealed that 88% of these companies disclose their water sustainability information; however, most of these companies are only beginning to implement the process. Only one company mentioned water in an effort to integrate water sustainability with its published reports. 94% of the companies made no link between their water sustainability disclosures and their financial reports. Only 38% of the companies' water sustainability disclosures were subject to independent audits. The food production sector performed better, in that 87% of the companies in this sector provided water sustainability disclosures and the majority have made good progress towards the implementation of this process. Gaps in their disclosure were in terms of their engagement with their suppliers in relation to water sustainability. Similar to the

construction sector, only 20% of the companies made some effort to integrate water sustainability disclosures with their published reports. 40% of the companies provided evidence of independent audits taking place.

Ninety six percent (96%) of the industrial metal and mining sector's companies provided water sustainability disclosures in their integrated reports and the majority of these companies have made good progress towards achieving this criterion; however, their weak point was that only 12% provided a level of integration of water sustainability information in their respective financial reports. The mining sector performed the best with regards to ensuring that their water sustainability disclosures are independently audited; 64% of the companies provided evidence of this.

In terms of the oil and gas sector, all six companies provided water sustainability disclosures in their integrated reports and five companies ensured their disclosures are independently audited; however, only one company showed a minor level of integrating water sustainability with their financial reports. These findings are supported by Askham & Van der Poll (2017) in their study of the sustainability reports of mining companies, whereby it was concluded that all companies provided water sustainability disclosures whilst a low number of mining companies provided third party assurance on water disclosures. In contrast, Solomon & Maroun (2012) argue that sustainability disclosures have increased; however, these reports included mostly rhetorical disclosures, which focus on positive factors and exclude the negative, thereby limiting value creation. Haji & Anifowose (2016) mention that integrated reporting is often being utilised as a legitimacy tool and has become ceremonial in nature instead of robust and accountable mechanisms for the benefit of stakeholders.

From this discussion, all four sectors struggled to integrate their water sustainability disclosures with their financial reports. Companies need to make an effort to improve on this aspect of disclosures. In conclusion, the industrial metal and mining sector performed the best out of the four sectors for the disclosure category, which is the most essential category in this study.

4.7.2 Levels of management involvement

This category provides an understanding of the level of management oversight into water management and sustainability and whether the management of companies consider water in business planning and investment decisions. Further to this, this category determines whether companies have set their own performance standards and goals on water sustainability and

whether these goals have been reached. Finally, it determines whether companies have a water policy in place, which emphasises and recognises the importance of water to the business.

The analysis of the integrated reports of the selected South African companies showed that in terms of senior executive involvement and oversight from the board, the performance from all four sectors was satisfactory; most companies are just beginning to implement the process and there is minimal disclosure of senior executive involvement in water sustainability. These findings are consistent with the findings by Askham & Van der Poll (2017), which conclude that there were companies that were able to show data relating to water governance and the level of management involvement and there is evidence of initiatives being performed by companies to improve on these criteria. Similarly, these findings are consistent with CDP (2017), which concluded that companies have shown strengths in terms of their water governance.

Seventy five percent (75%) of the companies in the construction sector provided levels of consideration of water in business planning and decision making, whilst two companies provided specific detailed discussions regarding their consideration of water. With regards to performance standards and goals set, the construction sector underperformed. Only 6% of the companies have set performance standards and goals for wastewater discharge, as well as minimum standards for the quality of the effluent discharge. 56% of the companies have performance standards and goals set for water consumption for their own operations. The construction sector also underperformed in that only 44% of the companies had a policy in place to recognise the importance of water to their business.

For the food production sector, the criteria were met by 87% of the companies in terms of considering water in business planning and decision making. 33% of the companies set performance standards and goals for wastewater discharge and 20% set minimum standards for the quality of the effluent discharged. Performance standards and goals on water consumption were set by 60% of the companies. The sector underperformed in terms of having a public policy in place in that only 40% of the companies had a policy in place, which recognised the importance of water in business.

The industrial metal and mining sector had 76% of its companies consider water in their investment decision making or business planning. The mining sector performed slightly better than the other sectors, in that 36% of its companies set performance standards and goals for

wastewater discharge and met the criteria in this regard and 44% of the companies set minimum standards for the quality of the effluent discharged. 60% of the companies set performance standards and goals on water consumption and 60% had a policy in place to recognise the importance of water to their business. These findings are supported by CDP (2018), which revealed that 73% of companies have performance standards and water policies. Similarly, studies by Askham & Van der Poll (2017) confirm a high number of mining companies have policies in place together with targets set for water consumption and discharge. Similarly, the studies from CDP (2018) reveal that 73% of the companies have set performance standards and water policies in place.

The oil and gas sector, which is the smallest sector in this study, had five companies that consider water in decision making and planning. The same five companies have set performance standards and goals in place on water consumption. Only one company set performance standards and goals on wastewater discharge, as well as the quality of the effluent discharge. Four companies had a public policy in place, which set out clear goals and guidelines for water sustainability.

A matter of concern for this category is that all four sectors have not performed well in terms of setting performance standards and goals for wastewater discharge, as well as setting minimum standards for the quality of the effluent discharge. The level of disclosure for this criterion was either minimal or no disclosure at all. Companies need to place further emphasis on providing sufficient disclosure relating to this requirement. It can be concluded that the industrial metal and mining sector is the best performing sector amongst the four sectors in this category.

4.7.3 Management process and performance measurement systems

The last category of the assessment tool focuses on the identification, measurement and management processes of the company's water sustainability risks. This focuses on the collection and monitoring of data obtained, which relates to the company's own regulatory compliance, their usage of water, other external factors that could influence its water sources such as climate change, their stakeholder concerns and perceptions and its engagement with its suppliers with regards to water sustainability.

For the construction sector, 50% of the companies identified water risks as part of their operations. The sector underperformed in terms of the collection of water data. Only 44% of

the companies provided data relating to their water consumption from all sources and 0% of the companies provided data relating to their discharge of water. 63% of the companies provided various types of training to their staff members, but without specific reference to water sustainability. The construction sector failed to collect and monitor external factors affecting its direct water sources, as only 38% of the companies started to implement the process. The construction sector has done well in that 81% of the companies managed to monitor their own regulatory compliance and 94% collected data and responded to stakeholders' perceptions and concerns relating to water sustainability. However, the major concerning factor is that none of the companies disclosed any effort to engage with their suppliers in the supply chain process with regards to water sustainability.

The food production sector performed well in that 80% of the companies identified water-related risks and 67% provided their water consumption data. The criterion that the food production sector failed at was that only 27% provided data relating to their discharge of water. Training of staff was done by 93% of the companies; however, like the other sectors, the training was not focused on water sustainability specifically. 80% were able to collect information of external factors affecting their water sources and all the companies monitored their regulatory compliance. Stakeholder perceptions and concerns were also monitored by all companies and these were adequately responded to. Similar to the concern that affects the construction sector, only 7% of the companies were able to disclose some effort made to engage with their suppliers on matters relating to water sustainability.

The industrial metal and mining sector had 64% of their companies identify water-related risks. 68% provided data in terms of their water consumption and 44% of the companies provided figures on their water discharge. Staff training was performed by all companies; however, the training related to environmental factors in general. 64% collected information regarding external factors affecting their water sources whilst regulatory compliance was monitored by 68% of the companies. All companies monitored their stakeholder perceptions and concerns and responded to these adequately; however, only 8% showed disclosures relating to their engagement with their suppliers on water sustainability. These findings are consistent with the studies performed by Askham & Van der Poll (2017), which indicated that all nine companies were able to identify water risks in their direct operations and monitored external factors that could affect their water sources, whilst also confirming the weakness identified concerning poor disclosure relating to the monitoring of supplier water practices. Similarly, studies from

CDP (2018) reveal that only 30% of companies have set performance standards and monitor their suppliers regarding their water practices. Sánchez-Hernández et al. (2017) reveal that companies are recognising that the quality and availability of water is a strategic sustainability issue, which requires extensive monitoring and management.

The oil and gas sector had five companies identify water-related risks, four of which adequately disclosed their water consumption figures and three disclosed their discharge figures. All six companies have done training for their staff on general matters relating to the environment. Three companies collected data on the external factors affecting their water sources. All companies were able to monitor their regulatory compliance as well as stakeholder perceptions and concerns. The oil and gas sector also struggled to provide satisfactory disclosures relating to their engagement with suppliers on aspects relating to water sustainability.

A major concern, which affected all four sectors with regards to the third category, was that training had been done by most of the companies, however, specific training relating to water sustainability measures was lacking. Water discharge figures are not disclosed adequately by many companies throughout all four sectors. Finally, the concern relating to their engagement with their respective suppliers has not been disclosed by most companies across the sectors. Emphasis needs to be placed on companies to interact with their suppliers to ensure water sustainability measures are taken into consideration throughout the supply chain process. The best performing sector amongst the four sectors for this category was the industrial metal and mining sector.

4.8 CONCLUSION

This chapter contained the actual research and generated findings in order to respond to the research objectives of this study. A Disclosure Assessment and Performance Tool was used to analyse the integrated reports of a sample of selected South African companies in four sectors of the economy. Only companies based in South Africa and listed on the JSE were included as part of this study. Discussions per sector were also provided for each of the questions on the Disclosure Assessment and Performance tool in order to substantiate the ratings given for each company in a particular sector. The industrial metal and mining sector has the greatest number of South African companies listed on the JSE and was also the best performing sector in this study, whilst the construction sector was the worst performing sector.

The companies in this study grasp the seriousness of the global water crisis and, specifically, in South Africa and are making efforts to reduce their water risk. Mining companies have been putting measures in place to protect this valuable resource from contamination and improve the quality of water; however, major improvement needs to be made in the area of engaging with their respective suppliers in the supply chain process in order to lower their water risk.

Chapter 5

Conclusions and Recommendations

5.1 INTRODUCTION

The previous chapter provided a detailed discussion of the results of this study and provided the research findings. This chapter provides a conclusion on the research findings and provide recommendations on how companies can improve on their water sustainability disclosures. South Africa is in a crisis relating to the quality of available water and it is regarded as one of the water-scarce countries in the world. South African companies, therefore, need to play their part in recognising the importance of water and show their commitment to alleviating water scarcity in South Africa. The purpose of this study was to examine and compare the extent of water sustainability disclosures in the annual integrated reports of South African JSE listed companies and to evaluate the quality of such disclosures.

The data were collected by downloading and examining the integrated reports of South African JSE listed companies in four water-intensive sectors in the economy. A total of 62 integrated reports were chosen, which represented 100% of the population of the four sectors. The largest sector was the industrial metal and mining sector, which consisted of 25 companies and the smallest sector was the oil and gas sector, which consisted of six companies. The measuring instrument used for this study was a Disclosure Assessment and Performance Tool, which consisted of three categories of questions that were aligned to the three research objectives pertinent to this study. The integrated reports were used to respond to all the questions in each of the three categories.

5.2 CONCLUSIONS

Based on the findings of all four sectors, it was concluded that the industrial metal and mining sector was overall the best performing sector in the study. However, this sector, together with other sectors, has also struggled in its performance in a few areas. These areas included the level of detail that is disclosed in the integrated reports. Many companies provided minimal disclosure on certain aspects of water sustainability. There is also a lack of integration between water sustainability information and their financial reports. The setting of performance

standards and goals in terms of wastewater discharge and standards for the quality of the effluent discharge were not adequately disclosed. Staff training performed by companies was not specifically related to water sustainability disclosures but rather to environmental aspects in general. The major concern that affected almost all the companies in the four sectors was their engagement with the respective suppliers in the supply chain process. Disclosures regarding this were either minimal or non-existent for most of the companies.

5.3 RECOMMENDATIONS

5.3.1 Recommendation one - collaboration with suppliers

Companies need to take cognisance of the amount of water that is embedded in the supply chain process. They need to collaborate with their suppliers in terms of water sustainability measures and assist them in order to lower their water risk and ensure that they are also taking part in the initiative of incorporating water sustainability measures within the supply chain process.

5.3.2 Recommendation two – contracts with suppliers

Companies should stipulate their water-related requirements in their contracts with suppliers. If their requirements are not adhered to, the contract must become null and void

5.3.3 Recommendation three – staff training

Companies need to provide more in-depth training to their staff on aspects specifically relating to water sustainability, as currently there is no evidence from the disclosures that this is taking place. The training that is currently taking place focusses on environmental factors, which could lead to minimal emphasis on water sustainability specifically.

5.3.4 Recommendation four–integration with financial reporting

Companies need to integrate their water sustainability disclosures with their financial reports. Companies are able to disclose water sustainability risks; however, they are unable to put a rand value to these risks, thereby limiting the financial motivation to improve their performance on water sustainability.

5.3.5 Recommendation five – investor involvement

Investors should also play their part in water sustainability by conducting extensive engagements with companies that have a large impact on water sustainability, as water is a scarce resource and a requirement for human survival,

5.4 RECOMMENDATIONS FOR FURTHER RESEARCH

Further research could incorporate the other types of natural capital components that are disclosed in the integrated reports and are managed by organisations. Disclosures on the impact of climate change or carbon emissions by companies can also be researched.

The focus of this study included four water-intensive sectors. Further research could be expanded to other sectors of the economy that play a role in the usage of water in their business activities.

Future research could focus on the scrutiny of companies to determine their efforts made to assist their suppliers in having water sustainability measures in place. This was a major problem that was identified in this study. The location of suppliers and how this could pose a water risk can be researched further.

5.5 FINAL REMARK

Companies are the largest users of water and are continuously realising the impact that they have on water sustainability, which will affect future businesses and society. Increased pressure now needs to be placed on these companies to ensure continuous improvement in their performance relating to water sustainability. This, in turn, will result in a reduction of environmental issues, including water scarcity faced in South Africa and across the globe

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APPENDIX A: EVALUATION MATRIX

1. Disclosure
1. Does the company make disclosures in the integrated reports specifically relating to water sustainability and in line with the reporting initiatives such as the Global reporting initiatives, water disclosure project, Ceres aqua gauge, and International integrated reporting council.
2. Does the company include water information as part of its published financial reports
3. Does the company show evidence of water disclosures that has been audited by external auditors

2. Levels of management involved
1. What is the involvement of senior executives with regards to managing of water sustainability risks
2. What oversight role does the board have in terms of water sustainability
3. Does management take into consideration water in their investment decision making or business planning
4. Has management set itself performance goals or standards on their consumption of water?
5. Has management set itself performance goals or standards on their wastewater discharged into the environment?
6. Has the company provided a description of any minimum standards set for the quality of effluent discharge and how were they determined.
7. Does management have a water policy in place which recognises the importance that water is to the organisation

3. Identification/Measurement/Management processes
1.Has the company identified water related risks in direct operations
2. Has the company provided the total water withdrawal/consumption from all areas with water stress per source
3.Has the company provided total water discharge to all areas per destination, ex groundwater, surface water, sea water
4.Does the company provide training to staff relating to water usage
5. Is data collected and monitored on external factors affecting their water source
6. Has the company monitored and managed its own regulatory compliance relating water usage and discharge
7. Is data collected and monitored on stakeholder perceptions and concerns related to water issues
8. Does the company engage with and assist its suppliers throughout the supply chain process on water related issues

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

Mr Sulaiman Osman (207505452)
School Of Acc Economics&Fin
Westville

Dear Mr Sulaiman Osman,

Protocol reference number: 00001895
Project title: Water sustainability disclosure in the integrated reports of JSE-listed companies in South Africa

Exemption from Ethics Review

In response to your application received on 1 October 2019, your school has indicated that the protocol has been granted **EXEMPTION FROM ETHICS REVIEW.**

Any alteration/s to the exempted research protocol, e.g., Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through an amendment/modification prior to its implementation. The original exemption number must be cited.

For any changes that could result in potential risk, an ethics application including the proposed amendments must be submitted to the relevant UKZN Research Ethics Committee. The original exemption number must be cited.

In case you have further queries, please quote the above reference number.

PLEASE NOTE:
Research data should be securely stored in the discipline/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours sincerely,

[redacted] 14 May 2020

--[redacted]----------

Prof Josue Mbonigaba
Academic Leader Research
School Of Acc Economics&Fin