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Evaluation of the JSE's environmental reporting requirements of South African listed companies

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A research report submitted to the Faculty of Science, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science.

11 June 2023 in Johannesburg

Declaration

I declare that this research report is my own, unaided work. It is being submitted for the Degree of Master of Science at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.



Signed: Viratha Hariram

11 June 2023 in Johannesburg

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Abstract

Through its mandatory environmental reporting requirements, the Johannesburg Stock Exchange (JSE) plays a pivotal role in the private sector to align to Environmental, Social and Governance frameworks and disclose information of a company's environmental priorities and performance in addressing areas of concern. While there are attempts to safeguard the environment from damage and degradation, it is unclear if this framework is suitable at appropriately addressing the environmental areas of concern facing South Africa. In order to evaluate the JSE's environmental requirements on listed companies, this study aimed to identify the local and global environmental priorities via the South African State of Environment Outlook Report (local view), National Development Plan (local view) and Sustainable Development Goals (global view) and thereafter determine if the Global Reporting Initiative, the only set of mandatory environmental requirements of the JSE, was adequately addressing the indicators they outlined. Furthermore, using a scoring system from zero to four, the study evaluated the alignment of ten randomly selected JSE listed companies against the requirements of the Global Reporting Initiative to note their level of adherence and alignment to the South African State of Environment Outlook Report, National Development Plan and Sustainable Development Goals.

The results indicate that the Global Reporting Initiative (GRI) covers 73% of environmental priorities discussed in the South African State of Environment Outlook Report, National Development Plan and Sustainable Development Goals. Of the total 74 indicators of environmental concern identified from the three reports, the GRI did not require disclosure for 20 indicators. Only three indicators that were required to be disclosed by the GRI had scored a four on the rating scale due to it being an integrated disclosure that takes into account one or more other related environmental categories. The evaluation of the sampled listed company's adherence to the GRI via their sustainability reports and integrated annual reports indicated that none of the companies had provided sufficient disclosures to meet the requirements of the GRI. 80% of the sampled listed companies made a strong alignment to the Sustainable Development Goals in their sustainability reports and / or integrated annual reports.

A shortcoming of the JSE that was stated by all four sustainability experts interviewed was the lack of enforcement for listed companies to make quality and comprehensive disclosures or accountability expected from listed companies. There is no formal process of review or consequences for listed companies who do not comply.

The outcomes of this study indicate that the JSE should review the efficacy of GRI reporting for its listed companies

Key words: Disclosure; environmental priorities; ESG; Global Reporting Initiative; Johannesburg Stock Exchange

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Chapter 1: Introduction

Businesses are known to have impacts on the environment and society, with some industries, such as mining, often acknowledged as having significant negative impacts (Agboola, *et al,* 2020). There has been a growing awareness regarding the need to mitigate such impacts through disclosing plans of how these impacts can be better managed and reduced (Bonini & Görner, 2011). In order to ensure consistent and quality disclosure of a business's practices that can affect the environment and society, a number of sustainability tools have been developed and evolved since the topic of sustainability became main stream (Kolk, 2004).

1.1 Sustainability and its adoption in the private sector

The 1960s and 1970s saw the conversation on the meaning of human development and sustainability gain traction, with the aim on how we achieve economic growth that takes into account the growing awareness of the limits of that growth (Pisani, 2006). A report released in the 1970s stated those limits as a rapid increase in population, pollution and depleting natural resources (Pisani, 2006). This report resulted in a debate between those who acknowledged that limits to growth were valid, but through humankind's innovation and resilience it could be overcome, and those who believed that humankind were going to face the complete breakdown of the natural environment, thus threatening the survival of the human species. Eventually a compromise was made with the idea of sustainable development taking into account both the natural environment and economic development (Pisani, 2006).

The 1987 Brundtland Commission report titled "Our Common Future" defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987, p. 37). Although this term has since developed various iterations, the core meaning remains to ensure that there is socio-economic development without comprising the health of the environment, that the needs of all parties are met, including the less advantaged, and that the quality of life of future generations is ensured (Tomislav, 2018).

Approximately 40% of the world's top 100 economies are from the private sector, an indication of the power and influence they hold. Their operations have the potential to significantly impact the environment and society (Karieva, McNally, McCormick, & Ruckelshaus, 2015), a concern that

has resulted in a push for companies to begin reporting on their non-financial disclosures, focusing on their environmental and social impacts and performance. Such a practice has been occurring since the 70's, however it was not formally known as what it is today: environmental, social and governance reporting (ESG). A key function of ESG reporting is to evaluate and report on an entity's impacts on and performance for the environment, society and on their governance practices. This is meant to act as a tool for transparency of the entity's holistic performance (Roth, 2014).

The private sector can play a significant role in promoting sustainable development via ESG reporting, with one tool being the adoption of a triple bottom line method. This form of reporting focuses on the reporting of environmental, social and economic impacts, and is the basis for non-financial disclosures in a company's annual report. An additional form of ESG disclosure, which is considered to be more holistic, is through the adoption of the six capitals model within an integrated report. This type of ESG consideration in a company's disclosure is aimed at linking six factors, or capitals, to provide a more holistic view of the company's performance: financial, manufactured, intellectual and human capital, society and nature / environment (Roth, 2014). But while it is valuable to disclose and report on a company's ESG impacts using the triple bottom line or six capitals reporting framework, through a Sustainability Report, ESG Report or Integrated Annual Report, it is equally important to ensure that targets are set and progress towards improving non- performing areas is made and tracked (Arvidsson & Dumay, 2022). The question then follows: how does a company know what to focus on in order to report well and make progress towards ESG, and thus contribute to sustainable development? This report will refer to two main points of sources to indicate what companies should be prioritising in their reporting, and will be focussed specifically on the "E" of ESG- global environmental priorities and local (South African) environmental priorities.

1.2 Global and South African environmental goals

In 2000, 189 members of the United Nations agreed on a set of eight goals aimed at improving the conditions of the world's poorest, known as the Millennium Development Goals (MDG), by 2015. Goal number 7 focused specifically on ensuring environmental sustainability for people through targets such as reducing ozone depleting substances, increasing the number of protected areas and the provision of safe drinking water. By the end of the 15 years, goal 7 had achieved

mixed results and it is therefore difficult to say whether one should consider it a success (Fakuda-Parr, Greenstein & Stewart, 2013; McArthur & Rasmussen, 2017).

In 2015, the United Nations launched the Sustainable Development Goals (SDGs) which built on the MDGs and include 17 goals aimed at addressing numerous environmental, social and economic global challenges to lead to a sustainable future. A commitment to meeting these goals by 2030 was signed by all 193 members of the United Nations, South Africa being one of them, with the expectation that corporates would act as a key partner in meeting these goals (United Nations Global Compact, 2020). According to the World Federation of Exchanges (2017), it is in the best interest of all stakeholders to play their role in working towards achieving the SDGs, as addressing issues such as poverty, climate change and gender equality would ultimately lead to economic growth for all. However, while the public sector can have a positive impact through improved and more focused policy development, the private sector can drive the adoption of the SDGs through influential financial institutions like stock exchanges and overall investments in the environment (Vijaya, & Reddy, 2017). From the 17 goals, 6 have been selected as the "global environmental priorities" for this report due to its direct link with environmental concerns: clean water and sanitation, affordable and clean energy, responsible consumption and production, climate action, life below water and life on land.

South Africa has its own unique environmental challenges that are overseen and regulated by the Department of Forestry, Fisheries and Environment (DFFE), with these challenges and recommendations discussed in detail in the latest South Africa Environment Outlook Report (SEOR) published in 2012 (Department of Environmental Affairs, 2012). This document, along with the National Development Plan (NDP), outline the country's environmental priorities that must be considered to meet not just the SDGs, but also the national goals to reduce inequality and enhance economic growth (National Planning Commission, 2012). The SEOR and the goals related to the environment from the NDP have been selected as the "local environmental priorities" for this study.

1.3 Stock exchanges and their role in influencing sustainability reporting

There has been an upward trend in investors reviewing ESG factors as part of their decision-making process, with sustainable investment increasing globally by 67% in the last four years (Ajour El Zein, Consolacion- Segura & Huertas- Garcia, 2019; Clementino & Perkins, 2020). The disclosure of ESG allows for more consistent and transparent performance on non-financial

indicators and can improve the brand value of a business, reduce operational costs and improve measuring and management of long-term risks (KPMG, 2018; Ajour El Zein, Consolacion- Segura & Huertas- Garcia, 2019; Clementino & Perkins, 2020).

As South Africa's only stock exchange and Africa's largest, the Johannesburg Stock Exchange (JSE) has acknowledged the role it plays in pushing its listed companies to adopt sustainability practices and has made various tools and frameworks available, some mandatory and some voluntary, that are used to encourage South African listed companies in acknowledging and participating in ESG principles and disclosure. However, for these tools and frameworks to be effective in meeting the goals of the SDGs, addressing the environmental concerns outlined in the SEOR and the national goals of the NDP, we need to assess if they are adequate and progressive in effectively responding to South Africa's environmental priorities.

1.4 Research aim, objectives and key questions

Based on the literature review, it is clear that attempts to safeguard the environment from irreversible damage are being made. However, it is not yet clear if these attempts are suitable in ensuring that appropriate measures are being taken by corporates to address the environmental concerns. The aim of this research was therefore to evaluate the mandatory environmental reporting requirements of the JSE against the environmental priorities of South Africa as reflected in the South African State of Environment Outlook Report, National Development Plan and Sustainable Development Goals.

The objectives were:

1. to identify the South African environmental concerns and priorities based on the 2nd South African State of Environment Outlook Report, the National Development Plan and United Nations Sustainable Development Goals;
2. to identify the JSE's mandatory environmental requirements set for listed companies,
3. to assess whether the JSE's mandatory tools adequately address South Africa's main environmental concerns and priorities,
4. to assess how the JSE's environmental reporting requirements are applied by listed companies through a review of 10 South African integrated sustainability reports
5. to assess if the JSE's environmental requirements are more aligned to global or local environmental priorities.

1.5 Layout of the Research Report

Chapter one of this report provides an introduction and rationale to the research, highlighting the research gap, aim and objectives of the study. Chapter two is a literature review, providing an in-depth understanding of key concepts of ESG reporting and addressing the most pressing global and local environmental concerns. Chapter three outlines the methodology used to conduct the assessments and evaluations to meet the objectives of this study. Chapter four presents the results derived from the assessments and evaluations, with chapter five discussing and analysing the results and a conclusion of all key points made in this study. Chapter five is followed by a reference list.

Chapter 2: Literature Review

2.1 Global Environmental Concerns and Priorities

It is projected that the global human population will grow from 7.7 billion today to approximately 10 billion by 2050, with the majority of that growth based in Africa and Asia (FAO, 2017). By 2100, it is expected that the human population will expand to 11 billion people, with 82% of the population residing in Africa and Asia alone (FAO, 2017). In an ever-changing global environment, the overarching environmental threat of climate change is already being felt, with greenhouse gas emissions being at their highest levels, potentially leading to irreversible impacts on societies and the environment (Hayat & Orsagh, 2015; FAO, 2017; Zhongming, Linong, Xiaona & Wangqiang, 2022). Zhongming, Linong, Xiaona & Wangqiang (2022) share similar sentiments, stating that the causes and impacts of climate change, food insecurity and threatened biodiversity have gained more international attention over the past 10- 20 years.

It is this type of attention on an increasing instability in society and drastic changes in climate that led to the concept of sustainability and sustainable development in the 1970s and 1980s. While sustainability originally focused on the ecological environment, the term grew to be more inclusive of social needs and corporate governance, leading to what is known as the three pillars of sustainability or the triple bottom line, which includes environmental, social and economic considerations (Barkemeyer *et al*., 2014; Holden, Linnerud & Bannister, 2014). The triple bottom line concept, developed in the 1990s, was initially created as an accounting framework for organisations to outline and reach various sustainability goals comprehensively (Slaper & Hall, 2011). Therefore, this concept centres on organisations measuring and disclosing not only their economic performance, but also their environmental and social performance. In following this framework, they are thus not just accountable to internal stakeholders like employees, customers and suppliers, but also to government, local communities, non- governmental organisations and industry bodies (Zak, 2015). As a result, there have been a number of guidelines developed for the private sector over the past three decades to provide some form of consistent reporting parameters, with the Global Reporting Initiative (GRI) as one of the more widely used triple bottom line frameworks (Barkemeyer, *et al*. 2014; Zak, 2015).

Building on the triple bottom line concept is what is known as the six capitals' model which includes financial, intellectual, human, manufactured, social and natural capital. This framework differs from the triple bottom line in that it considers natural capital as the basis for all other capitals

in a functioning economy and all capitals are interlinked, whereas the triple bottom line considers the environment, social and governance functions as individual and equal in value (Adams, 2015).

However, in order to understand this framework, it's important to know what defines a "capital". Capitals are typically defined as a hypothetical stock that changes over time in a business, with these stocks in constant interaction with each other. For example, in order for a business that manufactures office chairs to expand, it will likely require additional financial input to fund more modern machinery that can assemble parts together at a quicker rate. In this instance, the business would note that an increase in their manufactured capital came at the expense of their financial capital. This example demonstrates the flux that occurs between capitals (Adams, Coulson, Emmelkamp, Greveling, Kluth & Nugent, 2013). A key factor in the six capitals framework is that, even though the value of each capital may differ among companies and industries, all capitals are ultimately underpinned by the natural capital. This implies that every action taken to provide goods or services has some form of impact on the natural environment and that the impact on the environment will ultimately impact on the social and financial capitals nested within in (Adams, 2015). This research focused on the effects and impacts of the natural capital in relation to how JSE listed companies operate.

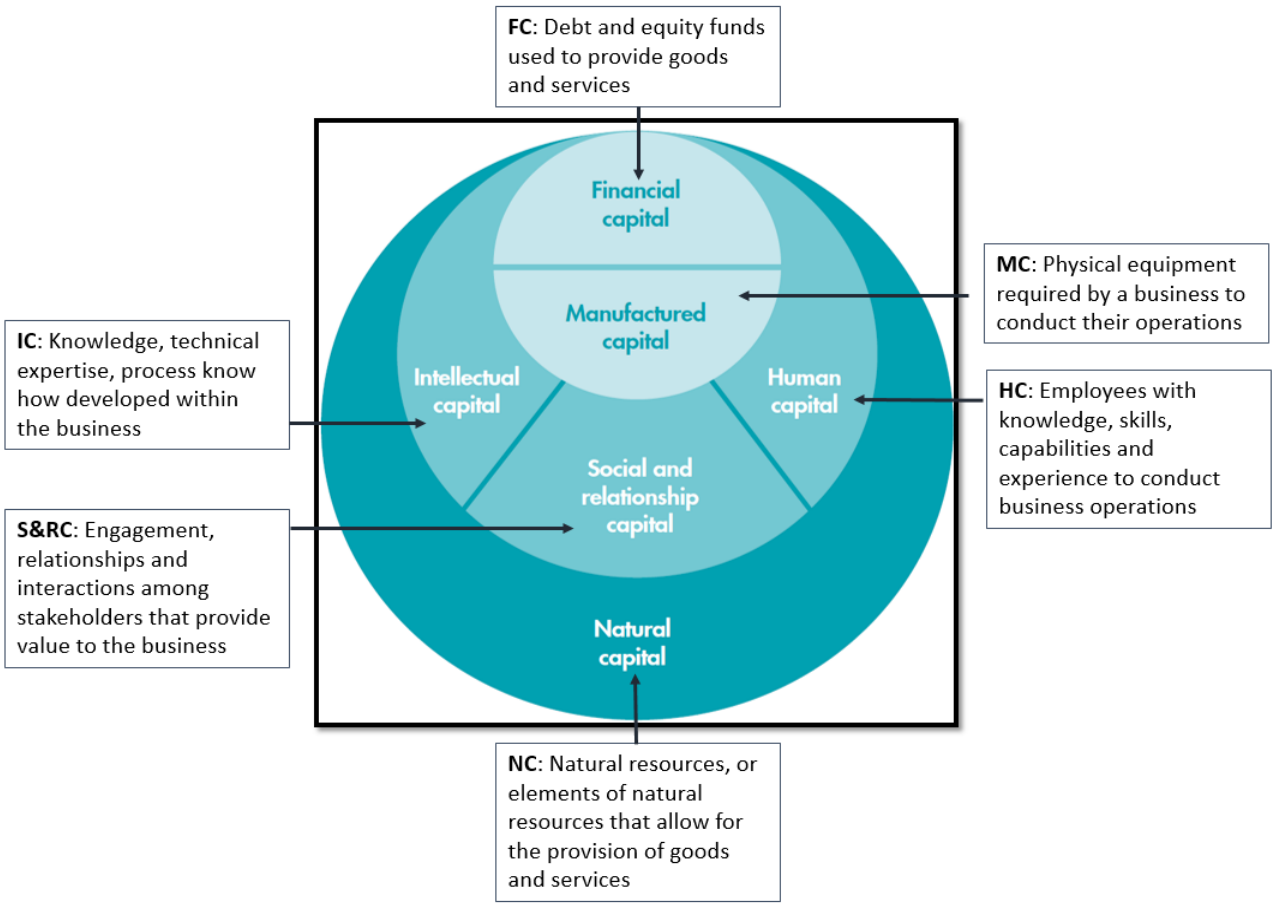

Figure 1 The six capitals (adapted from Adams, *et al.*, 2013)

As definitions of sustainability and frameworks supporting sustainability developed over the decades, there has been an increased awareness of the role that the public and private sector should play in ensuring a sustainable future for all (Kolk, 2008). In September 2000, representatives of 189 countries adopted the Millennium Development Goals (MDGs), facilitated by the United Nations. The purpose of the MDGs was to target eight areas for improving the state of society, which were: eradication of extreme levels of poverty, improving the health and well-being of mothers, reducing the rates of child mortality, increase access to primary level education, promotion of gender equality and rights for women, reduce the risk of communicable diseases, strengthen developmental partnerships globally, and ensure environmental sustainability. Each of these goals had targets and deadlines, with the ultimate deadline for achieving all goals set for 2015 (Chopra & Mason, 2015). The specific targets listed for ensuring environmental sustainability focused on integrating sustainable development principles in their development of

policies and governance, reducing the rate of biodiversity loss, and reducing the proportion of people who do not have access to basic sanitation and safe drinking water. There is no clear answer as to whether or not the MDGs were considered a success, with some reports stating that certain goals were well achieved, but there was little success in others (Fakuda- Parr, Greenstein & Stewart, 2013; McArthur & Rasmussen, 2017). According to the Millennium Development Goals Report (Ki-Moon, 2015), the environmental sustainability goal has resulted in a near elimination of ozone depleting substances and an expected recovery of the ozone layer by 2050, an increase in protected land and marine areas, and a 15% increase in the number of people globally who have access to clean drinking water from of 76% to 91% between 1990 and 2015. Although it was just one target related to the environment under the MDGs, it resulted in increased awareness of the importance of a stabilised and healthy environment in reducing societal degradation (Martin-Hurtado, Bolt & Hamilton, 2002).

In 2012, the United Nations Environment Programme (UNEP) Foresight Panel conducted a global study to identify the top emerging global environmental threats of the 21st century. This study, conducted by 22 specialist scientists, outlined 21 major environmental issues, all interlinked with each other, grouped into “cross-cutting issues” which focused on the misalignment between governance structures that do not necessarily meet the requirements of sustainable development, “food, biodiversity and land issues” where there is a growing concern of food insecurity due to water scarcity, climate change and reduction of suitable farming land due to an increase in bioenergy production and growth, “freshwater and marine issues” which considers potential collapses in oceanic environments due to overfishing, marine and land pollution, habitat destruction and increasing alien invasive species, “climate change issues” which is concerned with the unintended consequences of rushed mitigation and adaptation strategies, and finally “energy, technology and waste issues” which looks into the barriers created by inappropriate governance structures limiting how renewable energy can be expanded as a response to climate change, increasing waste volumes with minimal recovery of waste streams and the lack of assessment of the potential impacts from new technologies prior to its implementation (UNEP, 2012).

With a focus on improving the state of environment, society and governance structures and building on the momentum from the MDGs, the United Nations convened in September 2015 to facilitate the adoption of the SDGs, with all 193 UN member countries, including South Africa, agreeing to participate. The purpose of the SDGs is to build on the goals and work done, and incorporate learnings from the MDGs through the development of seventeen goals aimed at

increasing equity for all, fighting discrimination and inequality and protecting the environment (United Nations Global Compact, 2020). Although all seventeen SDGs are meant to be addressed holistically by all participating members, for the purposes of this report, I will be focusing on the impacts of the six environment-related goals listed in Table 1:

Table 1: Environmental- linked SDGs related to listed companies in South Africa

SDG Goal Number	Goal	Relevance to a JSE listed company
6	Clean water and sanitation	With South Africa listed as a water scarce country, acknowledging water as a shared resource and actively working towards addressing reducing water consumption, avoidance of pollution and adopting an approach of water stewardship, is central to a company's operations (Otieno & Ochieng, 2004).
7	Affordable and clean energy	Since the implementation of load shedding in South Africa in 2007, the country has experienced an unstable supply of energy from Eskom, the country's electricity public utility. Moving away from coal powered electricity and transitioning towards renewable sources of energy allows a company the ability to function and operate effectively (The Presidency Republic of South Africa, no date)
12	Responsible consumption and production	Apart from resource usage within a company's internal operations, the practices of their supply chain must be considered in order to ensure that resource use and production practices are responsible. The result of this awareness is the opportunity to increase efficiencies and save costs (Braun, Kleine- Moellhoff, Reichenberger & Seiter, 2018).
13	Climate action	Addressing climate change as part of a business continuity plan is key to ensuring that the inputs to climate change are reduced and that the impacts of climate change are mitigated. A company is advised to be adaptable to a

SDG Goal Number	Goal	Relevance to a JSE listed company
		changing environment arising from climate change, such as extreme changes in temperatures, increased potential for flooding and droughts (Sustainability expert 1, personal communications, 2023).
14	Life below water	South Africa's location and proximity to the Indian and Atlantic Oceans has allowed the country to position itself as a strategic maritime contributor. The benefits of a safe and healthy marine system also contribute to increased tourism, food security, absorption of CO_2, and supporting of industries such as fisheries (Department of Transport, 2017).
15	Life on land	South Africa is considered to be one of the world's most biodiverse countries, with a range of different habitats, including three biodiversity hotspots. With landowners being responsible for their land, they have a responsibility to ensure biodiversity priority zones are protected (Mucina & Rutherford, 2006).

These six environment-related SDGs are used as the "global" environmental priorities in which I assessed whether JSE-listed companies are adequately addressing key issues.

2.2 South African Environmental Priorities

South Africa, Africa's second largest economy, with a population of approximately 58 million people, is home to a rich and valuable ecological landscape with its unique biodiversity, availability of natural resources and coastal systems (Department of Environmental Affairs, 2012; OECD, 2013; Stats SA, 2019b). While the country makes up less than 1% of the earth's land, it is considered to be one of 18 "mega-diverse" countries due to its unique and varied biodiversity found in its terrestrial, freshwater and coastal systems (Wilson, *et al.,* 2020). South Africa is also home to nine terrestrial biomes and four marine ecoregions (Mucina & Rutherford, 2006). The abundant value that it provides is now considered to play a significant role in the country's

discussions on decision making through its inclusion in the National Development Plan: Vision 2030.

The 2nd South African Environment Outlook Report (SEOR) published by the formerly known Department of Environmental Affairs in 2012 identifies the main environmental issues facing South Africa and is meant to be used as a basis for policy and decision making. The value of this report lies in its ability to effectively communicate the state of the environment, how each component or theme of the environment is monitored, and gives its readers a better understanding of what environmental areas must be prioritised to ensure that resources are managed in a controlled manner without impacting on their quality or resilience. The report focused on nine broad environmental themes broken into separate chapters: land, biodiversity and ecosystem health, inland water, oceans and coasts, air quality, climate change, human settlements, energy, and waste management. Each of these chapters was compiled with the input and participation of environmental experts, government departments, private and public bodies to ensure accuracy and objectiveness (Department of Environmental Affairs, 2012). During my research of the country's environmental issues it was noted that, while the environmental conditions of South Africa are often explored, there was very little peer- reviewed literature that methodically ascertained what the main environmental concerns and priorities of South Africa were. Those that were available often grouped the issues of southern Africa together or selected specific issues to concentrate on, omitting others that did not fit the theme. One weakness of the SEOR is that the time line for developing, compiling and publishing a report is so lengthy that, by the time it is ready for release, it is likely that there are new environmental challenges that have occurred but are not included in the report (Sustainability expert 1, personal communication, 2023). That being said, the SEOR is still the most comprehensive report available focused on only South Africa, and due to its robust stakeholder engagement process, with input from researchers, academics, industry experts and validation process, the SEOR will be the main guide used to assess the JSE environmental reporting requirements for listed companies.

A supplementary resource that outlines and discusses the need for environmental protection and sustainability in South Africa is the National Development Plan for South Africa (NDP). This policy, which was compiled by 26 experts in their fields and released in 2011 "aims to eliminate poverty and reduce inequality by 2030" (National Planning Commission, 2012, p. 14). This is proposed through economic transformation, capacity building, economic growth and identifying and implementing necessary capabilities required to build a strong and thriving economy in which all can benefit. The plan was compiled after holding a number of consultation sessions and forums

that included a variety of stakeholders, such as government, the private and public sector, business, religious leaders, financial institutions and non- profit organisations to ensure that all representative voices were heard and included. A key action item that must be achieved to meet the aim of the NDP is focusing on environmental sustainability as well as scenario planning to enhance resilience against major environmental challenges. The NDP further commits to a standard of living that all citizens should experience, with a clean environment and access to water as minimum standards. It makes specific mention of the importance of environmental sustainability in reducing inequality caused by exploitation of natural resources and provides mitigation measures to prevent this (National Development Plan, 2012).

In a 2019 Stats SA report the President of South Africa, Cyril Ramaphosa, encouraged an integrated approach between the NDP and the SDGs, stating that achieving the SDGs must be prioritised in all decisions taken. South Africa's progress towards the SDGs were tracked and reported on by Stats SA in 2019, however no further country reports for South Africa were published since then (Stats SA, 2019a). As the SDGs are being used to provide global context to what the environmental concerns are, the SEOR and NDP are used to provide us with a local view on what JSE listed companies should be addressing as part of their environmental disclosures.

2.3 Responsible Investing and Sustainable Stock Exchanges

According to Kolk (2008), there has been a growing pressure on large private companies to take responsibility of how their operations can impact society and the environment. As a result, they are strongly encouraged to develop corporate governance structures, conduct environmental risk assessments of their operations and report on environmental, social and governance related performance transparently. This added pressure stems mainly from stakeholders, shareholders and investors who have a vested interest in the performance of the company and has since led many companies to transition towards the compilation of integrated reports, rather than standalone financial reports (Kolk, 2008; Amel- Zadeh & Serafeim, 2017). One such form of integrated reporting is an ESG disclosure report. Data disclosed under an ESG report is considered to provide information about a business' non- financial data. Examples of ESG disclosure relate to carbon emissions, water consumption, energy usage, waste generation and management, sustainable sourcing of goods ("Environmental"), customer responsibility, stakeholder engagement, labour relations, product quality, human rights ("Social") and anti-

corruption, board composition, risk management, corporate governance (“Governance”) (Kolk, 2008).

Investors play a key role in shaping the economic health of a country through their impact on economic growth, employment and stimulating effective business activity (Eccles, Nicholls & De Jongh, 2007). It is widely stated that there is value to investors in considering sustainability principles in their decision making (Eccles, Nicholls & De Jongh, 2007; Escrig-Olmedo, Muñoz-Torres & Fernandez-Izquierdo, 2010; Giamporcaro, 2011; Mitchell, 2014; Hayat & Orsagh, 2015) and this can be noted through the rapid increase in the number of signatories who signed up to the United Nations Principles for Responsible Investment (UNPRI) of 1 400 since its launch in 2006 (Amel- Zadeh & Serafeim, 2017). This consideration of ESG disclosures and principles for investments has been labelled under various names: socially responsible investment (SRI) and, more recently, sustainable investment or responsible investment being used interchangeably (Eccles, Nicholls & De Jongh, 2007; Hayat & Orsagh, 2015). While there is much overlap with these terms, there is also a slight differentiation with SRI placing greater emphasis on social, ethical and moral considerations of a business, while a responsible investment emphasises the financial risks and benefits that can be determined by evaluating ESG disclosures (Eccles, Nicholls & De Jongh, 2007; Hayat & Orsagh, 2015). However, ESG disclosures still include an element of scoring the social input, ethics and morality of a business (Hayat & Orsagh, 2015).

The key benefits of ESG reporting being used as a tool for responsible investing are as follows (Mitchell, 2014; Clementino & Perkins, 2020.):

1. Disclosure of ESG performance provides stakeholders with a better understanding of a company’s short to long term strategy;
2. A company disclosing their ESG impacts and considerations displays transparency and potential commitments to reduce their impacts on societies and the environment;
3. It provides investors with key information to be included in their decision making that builds on existing financial modelling;
4. Investors are better equipped to manage their exposure to regulatory and reputational risk;
5. ESG performance provides financial institutions with data on developing future responsible investment products;
6. ESG performance is linked to financial investment performance.

However, there are also challenges of incorporating ESG parameters into financial models as listed by Hayat and Orsagh (2015), KMPG (2018) and Clementino and Perkins (2020):

1. There is difficulty with accurately assigning a monetary value to ESG issues, resulting in challenges in investment decisions;
2. Disclosure of ESG issues is not always verified or displayed in a standard format, making comparisons challenging and potentially inaccurate;
3. Various responsible investment models have different methodologies and weighting for each ESG indicator;
4. Responsible investment is a long- term financial model and financial gains are not to be expected in the short term;
5. There is a lack of expertise around how to incorporate ESG factors effectively.

Eccles, Nicholls & De Jongh (2007) further state that, while the interest in and awareness of the value responsible investing holds has increased, there is still the belief that it is closely related to corporate social giving, with little return in financial value or influence over decision making. They suggest building a stronger business case for the value responsible investing creates which should be communicated to all relevant stakeholders, investors and asset managers.

Over the years, there have been a number of frameworks, guidelines, mechanisms, standards and principles developed to aid the integration of sustainability in business plans and strategies, the most prominent of which are listed and discussed in more detail below. This is to encourage greater disclosure of environmental performance as a means to meet various environmental goals and targets and to provide support to financial institutions (Barkemeyer, *et al*., 2014; Urdang, 2017; Sustainable Stock Exchanges Initiative, 2018).

- **The United Nations Principles for Responsible Investment (UNPRI),** launched in 2006, is a voluntary set of six principles related to formally incorporating formalised ESG disclosure into analysis instruments and ensuring that it is embedded in businesses making it favourable to invest in. It advocates for sustainable, long- term financial systems that create opportunities for environmental and societal benefits through its framework of the principles, and since its launch has over 3000 signatories of which the South African Government Employees Pension Fund was a founding signatory - the first asset owner in Africa to do so. Currently South Africa has 59 asset owners, investment managers and service providers signed up as members to UNPRI, with the JSE joining in 2009 (UNPRI,

2017). According to the UNPRI (2019), the value of assets under management of signatories of UNPRI totalled an estimated $80 trillion in 2019.

- **The United Nations Global Compact Principles** were launched by Kofi Annan, the former UN Secretary General, in July 2000. This voluntary initiative is aimed at corporates to align their business goals and strategies to address various ESG matters through 10 principles covering human rights, labour, environment and anti- corruption. These principles are interlinked in encouraging progress to achieve the SDGs. There are currently 72 South African companies, enterprises, academics and non- governmental organisations participating in the initiative (United Nations Global Compact, 2020).

- In response to a call for guidelines on corporate governance, ethics and transparency, The King Committee released a set of principles in form of a code for what would be deemed as good governance practices in a South African company, known as the **King Code of Corporate Governance** (Roberts, 2017). Sustainability was introduced as a concept in King II and was strengthened as an integral component of reporting in King III. The most recent code, King IV which was released in 2017, advises that the board of a company must consider the direct and indirect links between risk, performance, strategy and sustainability. As a result, integrated reporting plays a key role in disclosing not just financial performance, but social and environmental performance as well. While King IV is a set of voluntary principles, the JSE has made adherence to King IV a mandatory requirement for all its listed entities (Roberts, 2017).

- In addition to the above, the **Equator Principles** is a global voluntary framework to aid financial institutions in measuring and assessing the environmental and social risks of a project and is therefore used as a risk management tool. It is described as providing the minimum standard of due diligence, monitoring and oversight that can be used in the provision of financial products. Institutions that adopt the Equator Principles must incorporate various environmental and social policies and procedures internally, and require that all clients being serviced with financial products adhere to the Equator Principles as well (Equator Principles, 2020). The client is thus expected to provide an Equator Principles Action Plan along with an Environmental and Social Management Plan that will cover the duration of the project loan as a condition prior to the loan being approved (Werner, Sing-Dhulam, Mphafudi, Wilson & Pienaar, 2020). There are currently

four South African financial institutions that have adopted these principles (Equator Principles, 2020).

- The listing of **green bonds** on stock exchanges provides financing for environmentally focused projects, specifically those that target climate change, such as clean energy and low impact transport systems. There are currently 22 exchanges globally that list green bonds for investors (Climate Bonds Initiative, 2020). Green bonds are a financial mechanism used to fund large-scale exclusively environmental projects, particularly those that are focused on mitigating climate change, such as renewable energy, efficient transport and infrastructure for water accessibility (OECD, 2015; Ngwenya & Simatele, 2020). These types of bonds are able to finance or re-finance investments with low-cost, long-term capital (OECD, 2015). In 2017, the JSE launched its Green Bond Segment, providing investors and companies the opportunity for funding of environmental and climate change projects, thus emphasising its commitment to environmental awareness, performance, disclosure and its commitment to supporting reliance to climate change. The listing requirements are based on international best practice, but still take South Africa's unique landscape into consideration. As of 2019, the JSE is reported to have three bonds listed on its Green Bond Segment, totalling R5.10 billion (JSE, 2019).

- **The Global Reporting Initiative** was first developed in 1997 by organisations belonging to the Coalition for Environmentally Responsible Economies. The aim of this initiative was to provide a guideline and layout for ESG disclosure that was aligned to ISO 14001 standards and make it easier for stakeholders to compare ESG performance among those who used the reporting guidelines (Hedberg & Von Malmborg, 2003). According to Blasco and King (2017), the GRI is the most popular ESG reporting framework and is a critical tool in assessing corporate value for both government and market regulating policies. The GRI, however, does not come without criticism. Milne and Gray (2013) believe that the GRI creates confusion over what sustainable development actually entails through its focus on the triple bottom line, without defining how it views sustainability as an initiative. They go on to report that the triple bottom line approach that the GRI takes is unlikely to result in progressive sustainable development, or sustainability, due to its lack of "ecological thinking and literacy" (Milne & Gray, 2013, p. 25). That being said, GRI stakeholder councils are held frequently to discuss improvements on the layout and type of information requested, and communication and recommendations from those who use

the guideline is encouraged (Hedberg & Von Malmborg, 2003). The GRI guidelines are recommended in the King Code of Corporate Governance and due to the King Code adoption by the JSE, the GRI has become a mandatory reporting requirement of its listed companies (Institute of Directors Southern Africa, 2016) .

- **The Sustainable Stock Exchanges (SSE) Initiative**, a partner of the UN Global Compact, UNPRI, UNEP Finance Initiative and UN Conference on Trade and Development, provides stock exchanges with a platform for voluntarily collaborating with their stakeholders in improving ESG performance and financing of projects that respond to meeting the SDGs (Hayat & Orsagh, 2015; Sustainable Stock Exchanges Initiative, 2018). This is conducted via policy analysis, promoting networking of stakeholders and providing consulting services, guidance and technical advice (World Federation of Exchanges, 2017; Sustainable Stock Exchanges Initiative, 2018). Part of their role is also to work with securities regulators. Securities regulators around the world are said to have three objectives:
  1. to facilitate and empower stock exchanges to protect their investors;
  2. to create and ensure transparent and free markets;
  3. to reduce all forms of risk where possible.

- **The International Integrated Reporting Council** (IIRC) was formed in 2010 to address the concerns around non- financial disclosures, particularly on ESG, being reported in non- standardised, complex and lengthy formats. This made reviewing a company's performance difficult to understand and compare amongst peers. As a result, the IIRC proposed a mechanism to simplify the link between financial and non- financial disclosures via an annual integrated report that incorporates the six capitals framework. The inclusion of the six capitals ensures that the impacts on the environment from a company's operations are not ignored, but instead recorded, analysed and disclosed (Cheng, Green, Conradie, Konishi & Romi, 2014). Although a number of companies have since accepted Integrated Reporting as a standard, South Africa was the first to adopt this through the JSE, making it a mandatory requirement for its listed companies.

As these tools described above were developed to push for more responsible investment, there is a growing trend of stock exchanges around the world adopting these types of tools to address the targets of the SDGs (World Federation of Exchanges, 2017). Many stock exchanges hold a

unique position in encouraging, influencing and mandating their listed companies to develop transparent ESG reporting and disclosure methods, allowing themselves to be a useful force in promoting responsible investing (JSE, 2020). This is done through the use of existing frameworks and guidelines like the GRI and IIRC, or through the development of their own guidelines and recommendations (Urdang, 2017).

But ESG concerns differ vastly among industries with few standardised environmental priorities. For example, the environmental impacts and priorities of the retail industry would be different from the automotive industry. While local conditions must be taken into account, this can provide complexity for stock exchanges in requiring ESG disclosure parameters and for investors to make comparisons across companies (Mitchell, 2014; Urdang, 2017). However, stock exchanges are able to contribute to sustainable economic growth through the promotion of governance that is inclusive of ESG considerations and offering products such as green bonds, mandatory ESG disclosure and participation in ESG indices (World Federation of Exchanges, 2017). In addition, stock exchanges around the world often include so-called 'green' or ESG indices with the aim to promote ESG transparency and commitments to sustainable development. More well-known examples of these types of indices are the Dow Jones Sustainability Index and the FTSE4Good Responsible Investment Index which the JSE currently partners with.

A 2019 annual survey conducted by the World Federation of Exchanges (2019) on 57 of their 68 stock exchange members indicated that 30% of stock exchanges are currently included in an ESG index, with an additional 10% aiming to form part of an ESG index in the future. The survey also indicated that 77% of respondents require or encourage reporting of ESG considerations for their listed companies, with 56% of exchanges providing their listed companies with formal ESG disclosure guidelines to enhance the quality of information disclosed by companies (World Federation of Exchanges, 2019). In South Africa it is a listing requirement of the JSE to compile a disclosure report based on the Global Reporting Initiative framework and to release an annual integrated report due to the principles from King IV Report on Corporate Governance for South Africa (Urdang, 2017).

Based on the review above, it is clear that there is a link between the need for companies to disclose non- financial data in the form of ESG disclosures, the development of various tools and mechanisms to address this, and the acknowledgement of stock exchanges to use their influence in ensuring the adoption of these responsible investment initiatives.

2.4 JSE environmental requirements for responsible investment

The JSE is Africa's largest stock exchange, and the 16th largest in the world. They are a self-regulatory exchange that has been operating for 132 years with its headquarters in South Africa and offer equities and bonds, financial, commodity and interest rate derivatives (JSE, 2020). The JSE is a member of the World Federation of Exchanges, the Committee of SADC Stock Exchanges and African Stock Exchanges Association. Furthermore, they are a founding partner of the Sustainable Stock Exchanges Initiative (JSE, 2018). They acknowledge their significant role in influencing not just the companies that they list, but businesses and economic growth of the country in general, and openly try to use that influence to encourage awareness and monitoring of, and good performance on ESG matters by offering tools and mechanisms to facilitate and drive responsible investment. An area of value creation for the JSE is the environment, where considerations are not just based on a company's own footprint, but that of their stakeholders too. Their approach to sustainability is linked to their alignment and partnership with the South African national agenda, Sustainable Development Goals, King Code on Corporate Governance, FTSE Russell ESG, United Nations Global Compact Principles, World Federation of Exchanges and the Sustainable Stock Exchanges Initiative (JSE, 2018).

Based on recommendations of the King Code of Corporate Governance, a set of principles aimed at outlining effective, ethical and responsible decision-making and leadership, the JSE has made it mandatory for all its listed companies to compile and publish integrated reports. These reports must include disclosure of various ESG parameters based on the GRI framework (GRI, 2011; JSE, 2018). The use of a GRI framework, which allows for standardisation in reporting, will likely lead to more comparable data from companies (Sonnenberg & Hamann, 2006). According to a study conducted by Urdang (2017), the JSE is the only stock exchange that had developed both their own environmental guidelines as well as recommending adherence to the GRI guidelines for its listed companies.

In May 2004, the JSE had launched its own sustainability index, the Socially Responsible Investment (SRI) index, applicable to its top 160 listed companies. It was the first exchange in an emerging market to do so and indicated the value it placed on understanding how disclosure of a company's environmental, social and governance behaviour can impact the performance of that company based on 70 indicators. The objectives of the SRI were to highlight listed companies that were considering ESG in their business plans, provide some form of standardised measuring system for sustainability reporting and to support a market for SRI-related products. The model

for the SRI was based on the FTSE4Good index, however it was adapted to ensure it worked for the unique South African market, taking its history of inequality into consideration (Sonnenberg & Hamann, 2006; JSE, 2020). This index ran from 2004 until 2015, when the JSE partnered with FTSE Russell to replace the SRI with the FTSE Responsible Investment index series as a transition to advance sustainability practices for its listed companies and as a strategic partnership to ensure its assessment of ESG was aligned with international best practice (JSE, 2013; JSE, 2015; JSE, 2018).

The series is comprised of two indices, the FTSE/JSE Responsible Investment Index and the FTSE/JSE Responsible Investment Top 30 Index, and is reviewed in June and December every year with research on each listed company being conducted once a year (JSE, 2015). This FTSE-JSE partnership builds on the criteria of the SRI and allows participating companies to be part of a global network of companies that disclose not just their direct ESG performance but their organisational positions on, *inter alia*, child labour, corruption, violations to human and indigenous rights and climate change (Mitchell, 2014). The methodology used as part of the FTSE Responsible Investment index allowed for greater transparency, providing investors with more insight and opportunities in their decision making (JSE, 2015).

The index focuses on environmental, social and governance aspects as its three main pillars, with 14 themes (Table 2) covering over 300 indicators to form its rating. Companies only respond to indicators which are relevant to their industry (JSE, 2018). For example, an indicator relating to the negative impact of alcohol on customers would be applicable to those in the retail sector but not those in the construction sector. This form of self- reporting does have the risk of selection bias, which according to Barkemeyer, Revelli and Douaud (2023) can invalidate the ESG assessment.

Table 2: JSE FTSE Responsible Index Pillars and Themes (adapted from JSE, 2021)

Pillars	**Themes**
Environmental	Biodiversity
	Climate Change
	Pollution and Resources
	Supply Chain
	Water Security

Pillars	Themes
Social	Customer Responsibility
	Health and Safety
	Human Rights and Community
	Labour Standards
	Supply Chain
Governance	Anti- Corruption
	Corporate Governance
	Risk Management
	Tax Transparency

In June 2022, the JSE released a voluntary sustainability guidance document, named Sustainability Disclosure Guidance, with the purpose of providing support to its listed companies on how to effectively report on their sustainability performance. This document takes into account South Africa's unique landscape while still ensuring that it is relevant for a global audience. It has been developed in alignment with various global ESG frameworks, including the International Financial Reporting Standards, GRI and Task Force on Climate- Related Financial Disclosures (JSE, 2022). Although this document can be considered as one of the most relevant and cohesive ESG frameworks in South Africa to date, due to it being voluntary and being released within the last year, it is unlikely that listed companies would be ready to adopt the guidelines into their reporting cycle yet. Due to the recent release of this guideline and because this study was focused on only mandatory ESG reporting requirements, the JSEs sustainability guidance document were not examined in this research.

There are a number of tools and guidelines available to support a financial institution like the JSE in integrating disclosure of ESG performance for its listed companies. However, the key question that must then be asked is whether these ESG disclosures required by the JSE are adequately responding to and addressing the country's and the world's environmental concerns as highlighted in the SDGs, SEOR and NDP.

Chapter 3: Methodology

This study consisted of three main steps, starting with an understanding of the global and local based environmental concerns. This was followed by then determining what the JSE requires of its listed companies to address environmental concerns in order to compare it to what was identified from the SEOR, NDP and SDGs. Finally, we evaluated how the JSE environmental requirements were applied by its listed companies. These steps were analysed through content analysis and conducting of interviews with sustainability experts.

3.1 Identification of local and global environmental priorities

The 2nd SEOR, NDP and SDGs were selected due to them being the most recent, relevant and applicable documents that provide guidelines to address environmental concerns in the country and taking into account both global and local context. These three documents were reviewed to identify listed environmental concerns or areas of environmental priority and their associated indicators per priority theme. This was conducted through a review of the contents page of each report to highlight the most applicable chapters or section to this study. Thereafter, each selected chapter or section was read and reviewed through a thematic content analysis. All references to environmental concerns or goals to be met, such as the provision of reliable and renewable energy, reduction of waste generation and over- exploitation of biodiversity were listed. Due to this study being based on the actions taken by the private sector, only environmental concerns or goals that a business has the ability to address were recorded. To explain further, the provision of a carbon tax being implemented across the country would not be recorded as an environmental concern, priority or goal in this study as this would be considered a government-mandated instrument. As such, a business or the JSE would not be able to impose this type of instrument on themselves. In contrast, a target to lower emissions through any variety of methods is included in this review as this is a priority that the JSE is able to mandate a business to address as a listing requirement. All identified environmental priorities identified from the SEOR, NDP and SDGs, were then tabulated and compared to identify overlaps and differences.

3.2 Identification of mandatory environmental disclosure requirements

A content analysis was done of publicly available JSE mandatory environmental requirements for its listed companies. Two datasets were identified under their requirements, namely (1) The JSE Limited Listing Requirements and (2) the Global Reporting Initiative. Using the JSE Limited Listing Requirements and the GRI as the selected "JSE requirements", all environment-related requirements and disclosures were identified. This process involved conducting a keyword search of all environmental priority areas and associated indicators identified from the SEOR, NDP and SDGs. The outcomes of the JSE environmental reporting requirements content analysis were then compared against the South African environmental priorities, with the objective to evaluate if the focus areas of listed companies, as directed by the JSE, adequately address those stipulated in the SEOR, NDP and SDGs.

A scoring system was used with scores awarded based on the identification and robustness of the JSE environmental reporting requirements for each South African priority environmental indicator met (Table 3). All environmental reporting requirements were weighted equally.

Table 3: Scoring system for JSE environmental reporting requirements per environmental priority indicator as listed in the SEOR, NDP and SDGs (scorecard adapted from Urdang, 2017)

Description of JSE environmental reporting requirement score	**Score**	**Additional comment**
There is no requirement to address the indicator	0	**No reference** to the indicator is mentioned or inferred
There is a requirement for the indicator to be addressed but no detail of how this should be conducted or reported on	1	Reference is made to the indicator but **not** in a way that requires robust disclosure of data
Only qualitative **or** quantitative data are required	2	
Both qualitative and quantitative data are required in response to the indicator	3	**Context** to qualitative and quantitative disclosures are required

Description of JSE environmental reporting requirement score	Score	Additional comment
The requirement to address the indicator with qualitative and quantitative data is linked to other indicators	4	Priorities are addressed **holistically** with targets and progress towards targets required

3.3 Application of JSE requirements by listed companies

To understand how the JSE requirements are applied by listed companies in South Africa, a sample of 10 published sustainability reports (i.e. between 2020- 2021) was randomly selected from the top 100 JSE listed South African based companies, using the MS Excel random numbers generator function and reviewed to assess how the JSE environmental reporting requirements are applied. The numbers from the random numbers generator were linked to the company list obtained from the SA Shares online website (https://sashares.co.za/top-100-jse-companies/). If the company did not have a sustainability report, their Integrated Annual Report was referred to. In instances where the selected company did not make any sustainability disclosures or did not have a South African head office, that report was omitted, and the next applicable company was reviewed (

Table ***4***). The ten selected JSE listed companies in this study represent approximately 6% of the top 100 JSE companies market capitalisation, and cover the following industries: banking (*n= 1)*, mining (*n= 3)*, clothing retail (*n= 1)*, property development (*n= 2)*, chemicals *(n= 1)*, healthcare (*n= 1)* and asset management (*n= 1)*. The review of the sustainability reports noted the environmental disclosures made and scored the quality of the disclosure based on the scoring system listed in Table 5 below, as well as provided a median per environmental category.

Table 4: JSE listed companies selected for review

	Name of JSE listed company randomly selected	Type of sustainability report reviewed	Year of report disclosure
1	Mine 1	Environmental, social and governance report	2020
2	Bank 1	Environmental, social and governance report	2020

	Name of JSE listed company randomly selected	Type of sustainability report reviewed	Year of report disclosure
3	Mine 2	Environmental, social and governance report Report on climate change and water report	2021
4	Property 1	Environmental, social and governance report	2021
5	Property 2	Environmental, social and governance report	2021
6	Mine 3	Environmental, social and governance report	2021
7	Healthcare 1	Integrated annual report	2021
8	Asset Management 1	Annual sustainability report	2021
9	Chemical Company 1	Integrated Annual Report	2021
10	Fashion Retailer 1	Social and environmental report	2021

Table 5: Scoring system for integrated sustainability reports environmental disclosure per the JSE environmental reporting requirements (scorecard adapted from Kitsikopolous, 2018).

Description of the environmental disclosure score from published sustainability reports	Score	Additional comment
Environmental requirements are not disclosed	0	
Environmental requirements are disclosed but lacks detail or material insight / environmental requirements are only partially disclosed	1	The report does not provide a useful explanation of what the disclosure entails; provision of vague statements referring to disclosures but no factual statements; partial disclosures
Environmental requirements are appropriately disclosed per the requirements of the JSE	2	
Environmental requirements are disclosed and provide detail on past targets and future targets or expectations	3	Context of the disclosure, background as to why it is disclosed and progress towards measureable targets are detailed; reasons for anomalies or unexpected results are

Description of the environmental disclosure score from published sustainability reports	Score	Additional comment
		described; positive disclosures that do not warrant context.
The environmental requirement is not applicable	N/A	The requirement is not applicable to the company. For example, if the company being reviewed states that it does not operate on a protected area, disclosures around biodiversity in protected areas are not applicable.

An additional investigation was conducted by scoring all 10 selected JSE listed companies to determine if the environmental disclosures made in their sustainability reports made reference to the globally developed environmental based SDGs, locally developed environmental priorities from the SEOR, locally developed environmental priorities from the NDP, or whether they show equal alignment to both global and local to environmental priorities.

Table 6: Scoring of alignment to global or local environmental priorities

Description of alignment score	Score
No mention is made of the SDGs / SEOR / NDP in the reviewed sustainability report	0
Vague mention of SDGs / SEOR / NDP in the reviewed sustainability report, for example, “Our sustainability programme is guided by the SDGs” but no further mention of SDGs or any specific goals are provided	1
Some environmental disclosures are centred on alignment to the SDGs / SEOR / NDP	2
Strong commitment is made to environmental disclosures aligned to SDGs / SEOR / NDP. For example, a company would indicate that their programme is guided by the goals from the SDGs, those goals are listed and projects related to meeting those goals are discussed in detail.	3

3.4 Expert interviews

Interviews with the following stakeholders (*n*= 5) were held online via Zoom to provide qualitative data on how environmental concerns and priorities are selected and approached:

1. A representative from the Department of Forestry, Fisheries and Environment with experience with the department's Business and Biodiversity programme and green business who provided insight to how their environmental areas of concern are communicated to the JSE
2. Interviews with four independent sustainability consultants, who have over 10 years of experience in environmental sustainability impacts and reporting, to provide supplementary data on the efficacy of the JSEs response to manage environmental risks.

Two sets of interview questions were developed, one for each category of expert, and can be found in Annex A. All interviews were held between January and March 2023. Insights and comments from the interviews were analysed via a thematic content analysis with common views, differing opinions and direction to additional resources specifically noted.

Ethics clearance was obtained from the University of Witwatersrand Human (non-medical) Ethics Research Committee prior to conducting the interviews, ethics clearance certificate number: HA2108.

Chapter 4: Results

4.1 Identifying local and global based environmental priorities

The process of identifying the environmental priorities or areas from the SEOR, NDP and SDGs indicated 74 key indicators under 12 categories that require addressing or intervention by the business sector (Table 7). The SEOR provided the highest number of areas of concern to be addressed with 41, followed by the SDGs with 25 and the NDP with 8. There was no direct category for Climate Change identified in the NDP and SDGs, however this is due to indicators under Energy, Resilience to Climate Change and Biodiversity also addressing climate change. Oceans and coasts was the category with the highest number of indicators in all three reports (*n*= 14), followed by climate change (*n*= 11). The category with the least indicator coverage was environmental reporting (*n*= 1). Refer to Annexure A for a detailed breakdown of the indicators identified within each category.

Table 7: Number of indicators identified from SEOR, NDP and SDGs

Category	State of Environment Outlook Report	National Development Plan	Sustainable Development Goals	Total
Air quality	2	0	0	2
Biodiversity	2	0	5	7
Climate change	11	0	0	11
Economic infrastructure	0	4	0	4
Energy	2	0	2	4
Environmental reporting	0	0	1	1
Land	6	0	1	7
Sustainable resource management	0	0	2	2

Category	State of Environment Outlook Report	National Development Plan	Sustainable Development Goals	Total
Oceans and coasts	10	0	4	14
Resilience to climate change	0	4	1	5
Waste management	5	0	3	8
Water management	3	0	6	9
Total	41	8	25	74

4.2 Scoring of the JSE environmental reporting requirements against the local and global environmental concerns

An evaluation of the JSE Listing Notice indicated that there are no environmental requirements specifically referred to in this document. The only section that had links to any form of environmental reporting was found in section 12 related to mineral / mining companies, where these companies were required to disclose their environmental management plans (JSE, 2007). This did not address any environmental indicator identified from the SEOR, NDP and SDGs.

The GRI acts a JSE environmental requirement by default as it is mandated through the King Code of Corporate Governance, which the JSE is aligned to. All listed companies are required to develop and make publically available their GRI disclosures for all indicators that are relevant to their business. The GRI became the only viable set of environmental requirements mandated by the JSE for this study. Using the scorecard methodology from Table 3, the results indicate that, of the total 74 environmental indicators identified, the GRI protocol scored a zero on 20 indicators, a score of 1 on 19 indicators, a score of 2 on 5 indicators, a score of 3 on 27 indicators and a score of 4 on 3 indicators (Table 8). Of the 74 indicators, 47% exceed a score of 1, with just 4% receiving a score of 4 (air quality, climate change and environmental reporting) to indicate that the GRI requirement is integrated in its approach and takes into account the impact on other environmental categories. In order for the GRI to be more effectiveness in how it addresses the

identified environmental concerns, its requirements should be more robust and integrated, with fewer scores sitting below the score of 3.

Table 8: Number of GRI indicators per score in each environmental category

	GRI Score (0-4)					
Category	**0**	**1**	**2**	**3**	**4**	**Median**
Air Quality (*n= 2)*				1	1	3.5
Biodiversity *(n= 7)*	2	4		1		1
Climate Change *(n= 11)*	5	1	1	3	1	1
Economic infrastructure *(n= 4)*	1	2		1		1
Energy *(n= 4)*		1		3		3
Environmental Reporting *(n= 1)*					1	1
Land *(n= 7)*	3	2	2			1
Management of Sustainable Resources *(n= 4)*	1	1		2		0.5
Oceans and Coasts *(n= 14)*	7	6		1		0.5
Resilience to Climate Change *(n= 3)*	1	1		1		1
Waste Management *(n= 8)*			1	7		3
Water Management *(n= 9)*		1	1	7		3
Total number of indicators *(n= 74)*	**20**	**19**	**5**	**27**	**3**	

Tables 9, 10 and 11 show the detailed results of how the GRI disclosure requirements address all identified environmental concerns from the SEOR, NDP and SDGs. As a guideline of how to interpret the table in more detail would be to view Table 9 which lists its environmental priority categories and the various indicators within each category. For example, under the “Land” category, “clearing and harvesting” was noted as a concern in the SEOR, but as the GRI made zero reference to it, a score of 0 was applied. Similarly, under the “Oceans and Coasts” category, “discharge of waste water, sewage and untreated effluent into the ocean” was noted as a concern in the SEOR and both quantitative and qualitative information was required by the GRI, hence a score of 3 being applied.

4.3 Assessing the application of the JSEs environmental requirements by listed companies

The analysis of how each of the 10 selected companies applied the environmental GRI codes indicated a variation in what was disclosed. Figure 2 indicates that only 40% of the companies made disclosures on how their operations impact on their surrounding biodiversity. 50% of companies did not provide any data or disclosure on how their operations impacts on the surrounding biodiversity. The remaining 10% was marked as Not Applicable per their disclosure that none of their operations occupying land in areas of high biodiversity or protected areas. It is noted that all three mining companies scored a median of 2 compared to the median of 0 for the remaining seven companies.

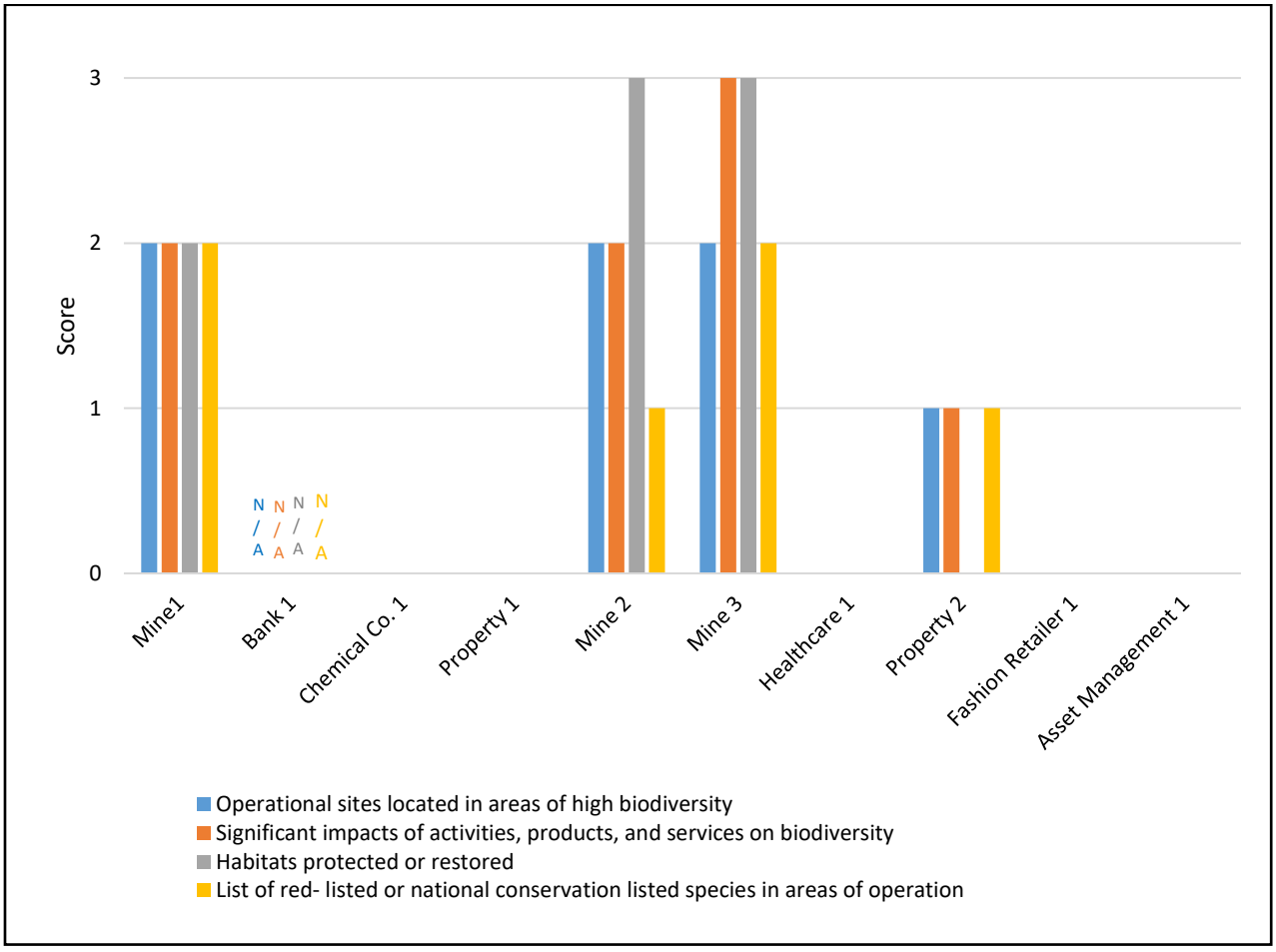

Figure 2 Comparison of responses to GRI Code 304: Biodiversity indicators between the selected JSE listed companies.

Figure 3 presents the scores for disclosure of emissions into the atmosphere. All ten companies made at least three indicator disclosures in their annual sustainability reports, however none made the full disclosures required of the GRI. Shortcomings noted when analysing the data were related to incomplete data disclosed, or vague statements of reductions or increases in emissions without additional information about the magnitude of this change. It is noted that the median disclosure score for these indicators in the three mining companies was 3 compared to 1 from the remaining seven companies.

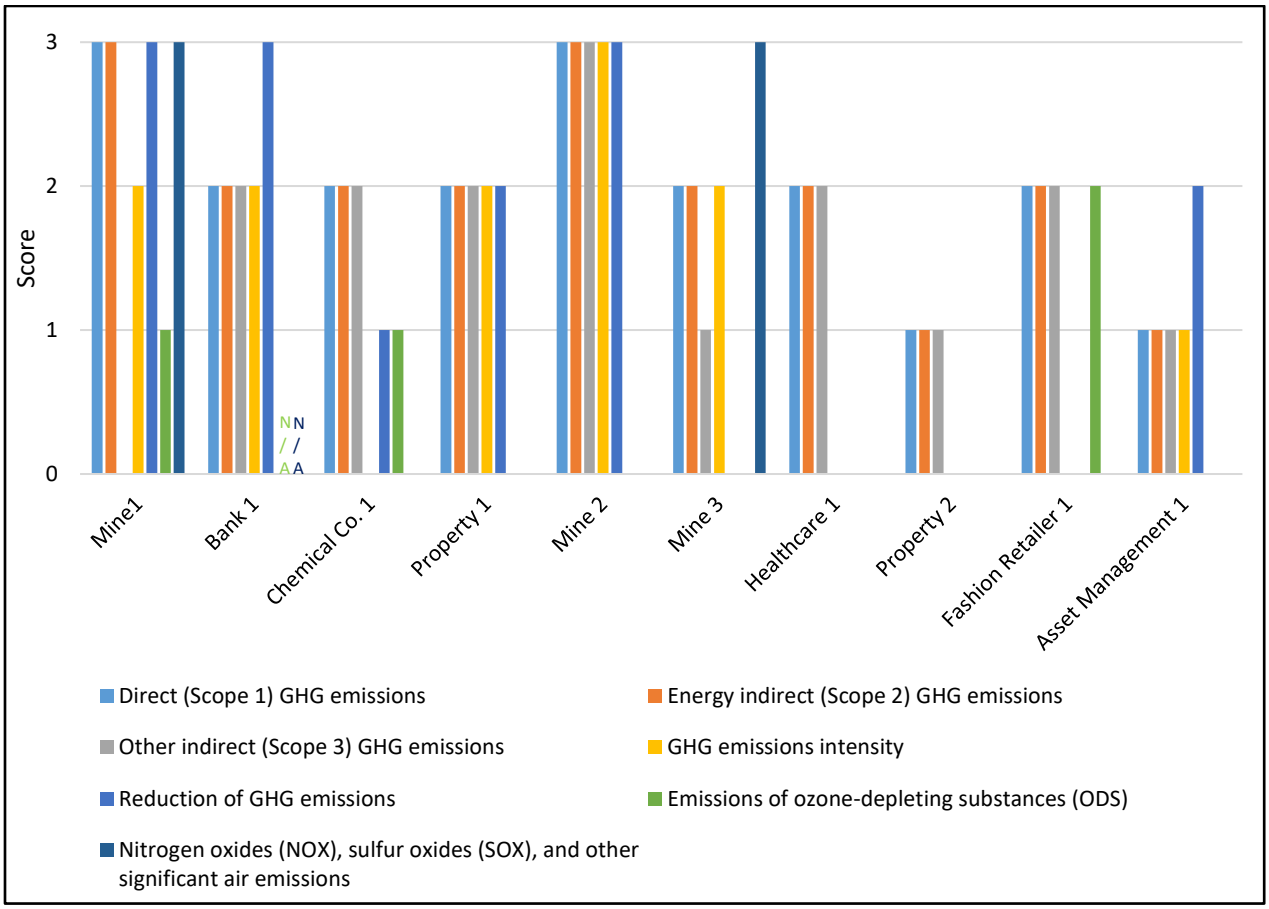

Figure 3 Comparison of responses to GRI Code 305: Emissions indicators between the selected JSE listed companies.

Disclosures on energy were made by 90% of selected companies, with only Asset Management Co. 1, not making any disclosures related to GRI Code 302 (Figure 4). No reason was provided for the omission of emissions data. Fashion Retailer 1 was the only company that reported on

emissions consumption outside of their organisation. Examples of energy use outside of the organisation include the consumption of energy upstream or downstream from their own operations, such as investments, customer use of products, purchased goods or services and employee travel. Mine 3 reported that they do not believe reporting on emissions from outside their organisation is material to their business. The median for the three mining companies was 2 compared to a median of 0 for the remaining seven companies.

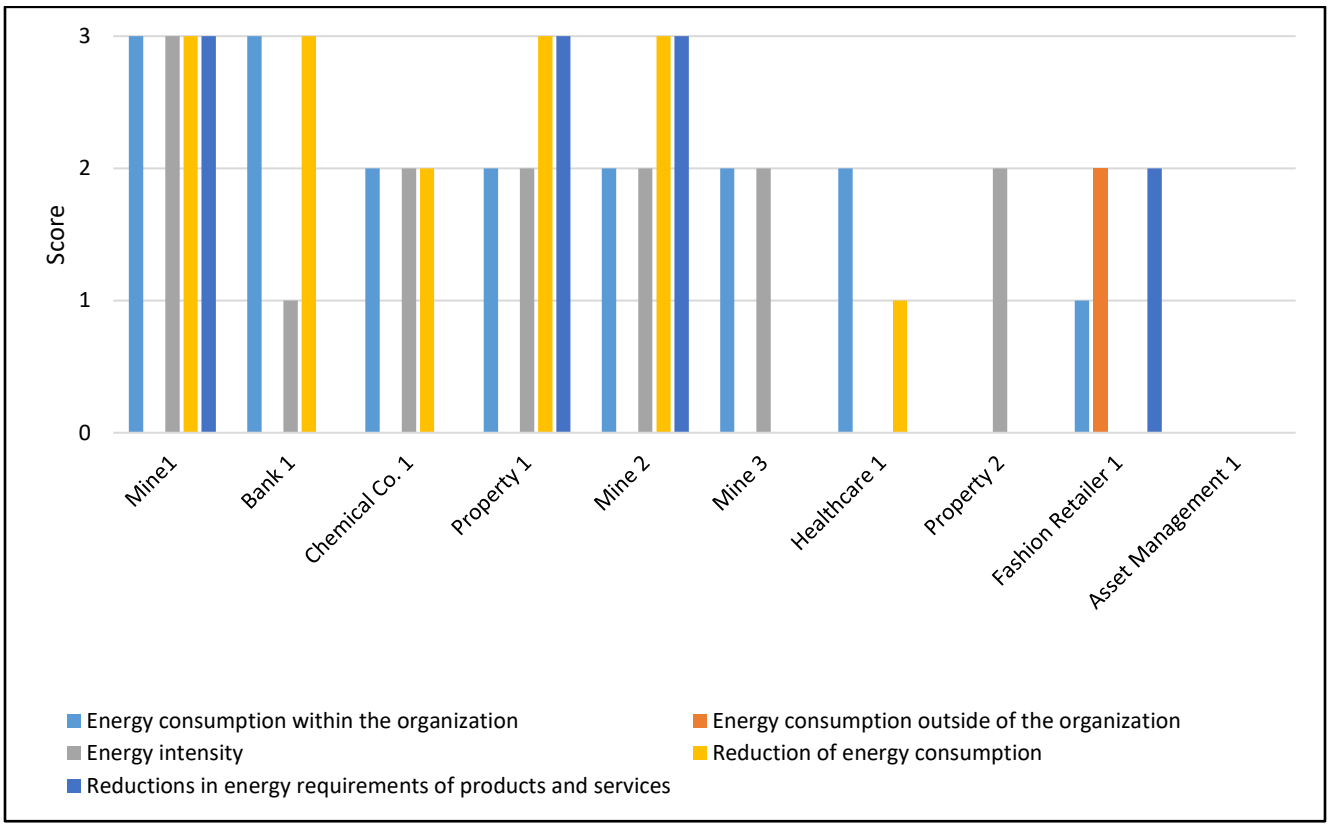

Figure 4 Comparison of the responses to GRI Code 302: Energy indicators between the selected JSE listed companies.

GRI Code 307: Environmental Compliance had one requirement for disclosure related to whether a company had received any fines or penalties for contravening any regulations or laws arising from their operations. This indicator is aimed at ensuring companies are disclosing the monetary value of fines and number of sanctions as a result of the contravention. 80% of companies were given a score of three due to their disclosure of no non- compliance being reported on for the year under review. The remaining 20%, Fashion Retailer 1 and Asset Management Co. 1, did not make

any disclosures relating to environmental non- compliance, and thus scored a zero. No reason was provided for the omission of this indicator.

GRI Code 301: Materials can be misunderstood as a waste indicator. However, according the GRI, the data and disclosures they seek under GRI Code 301 refer to the physical matter that is used in production. Due to this, the indicator was not applicable to the property and asset management companies. It is not an indicator that was well reported on with Mine 2 and Healthcare 1 making no mention of any materials used, reclaimed or recycled. The median for the three mining companies was 2, compared to a zero for the remaining seven companies.

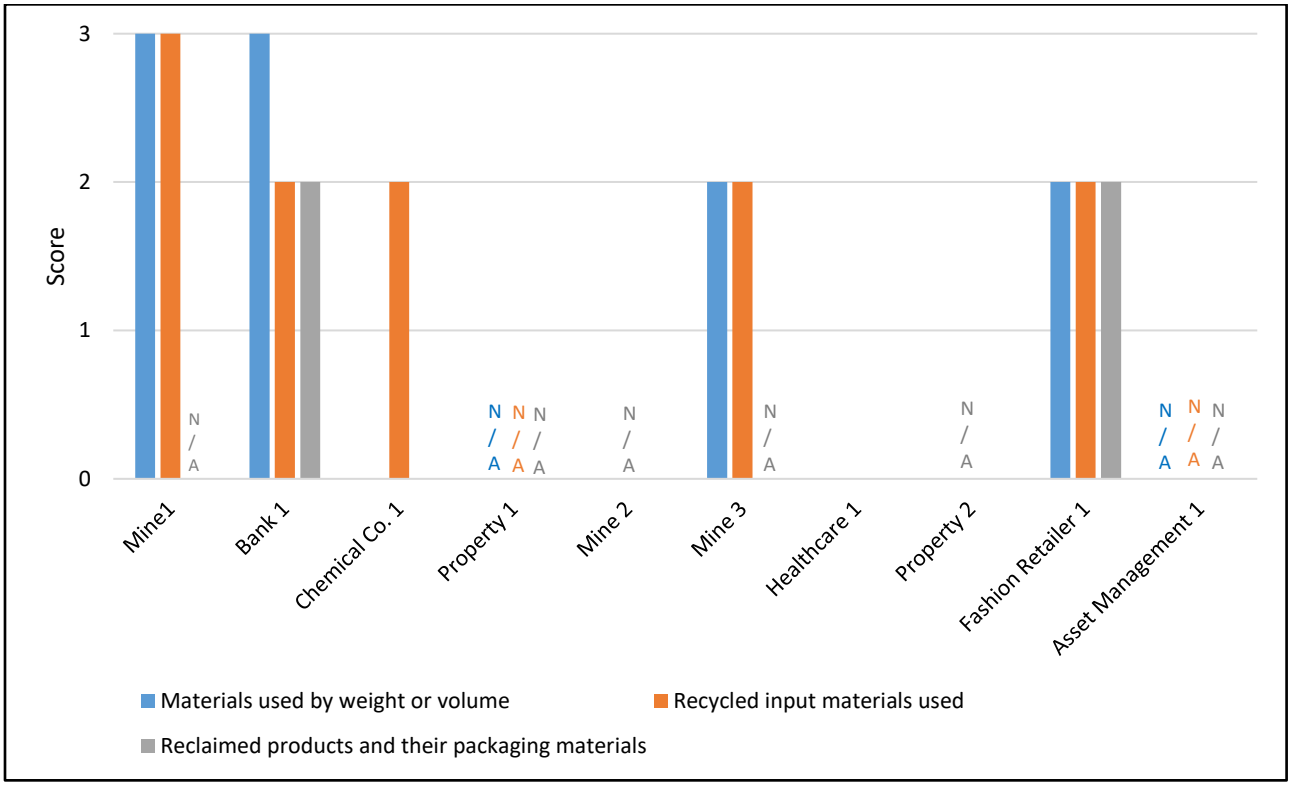

Figure 5 Comparison of responses to GRI Code 301: Materials indicators between the selected JSE listed companies.

Figure 6 displays results of companies that conduct a Supplier Environmental Assessment on their new suppliers, as well as outline a process to be followed as a result of negative environmental impacts caused by suppliers. This indicator is aimed at ensuring that a due diligence screening process is in place to identify and address any potential environmental concerns throughout the supply chain. The indicator was only reported on by Mine 3 even though

it is applicable to all companies. The median for the three mining companies was 0.5 compared to 0 from the remaining seven companies.

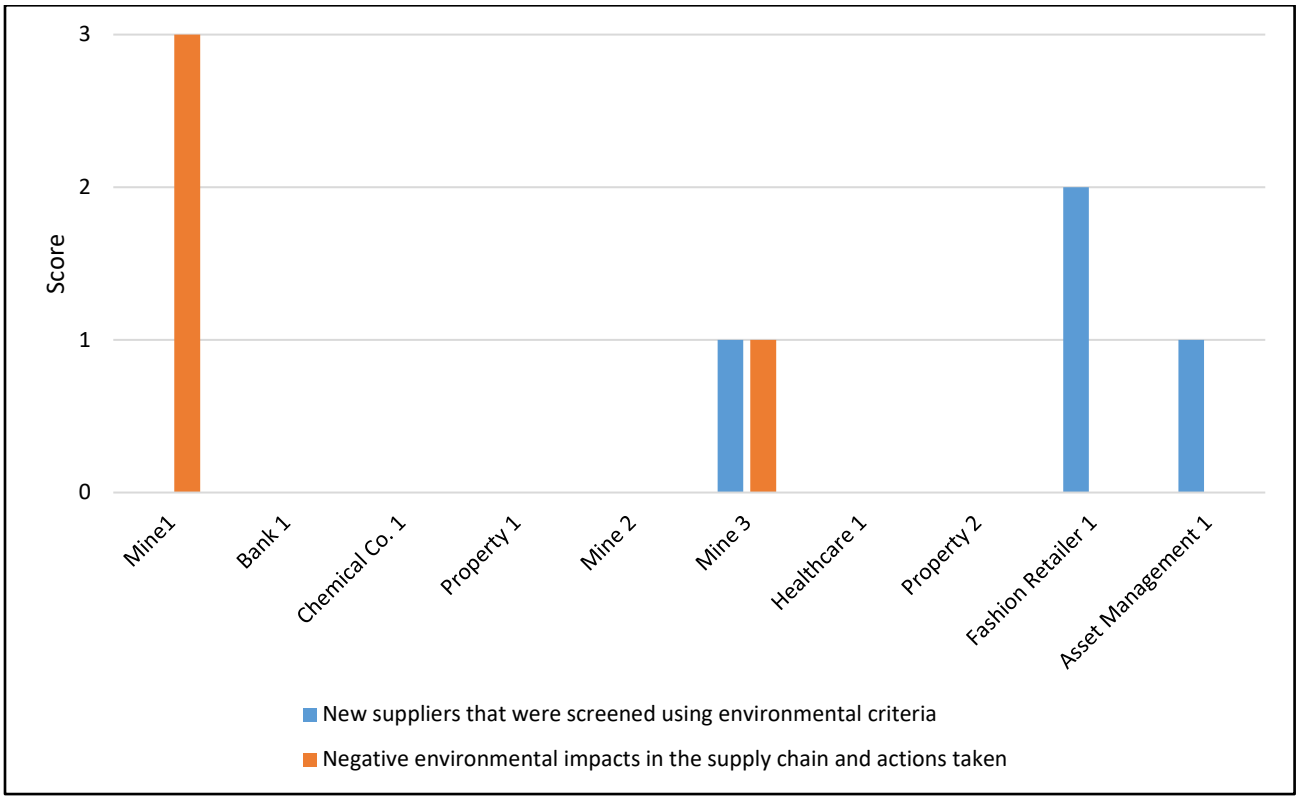

Figure 6 Comparison of responses to GRI Code 308: Supplier Environmental Assessments indicators between the selected JSE listed companies.

It was noted that 90% of the companies had made disclosures around waste management per the requirements of GRI Code 306: Waste. Within this section, there were four indictors where all companies had disclosed information: “waste generated, waste diverted from landfill and waste disposed of in a landfill”. Healthcare 1, a medical company that generates medical waste which is harmful to the environmental if inappropriately disposed of, did not make any mention in their sustainability reports of what the impacts of inappropriate waste disposal could result in, or how to manage potentially significant waste related impacts. The median of the three mining companies was 3 compared to 2 from the remaining seven companies.

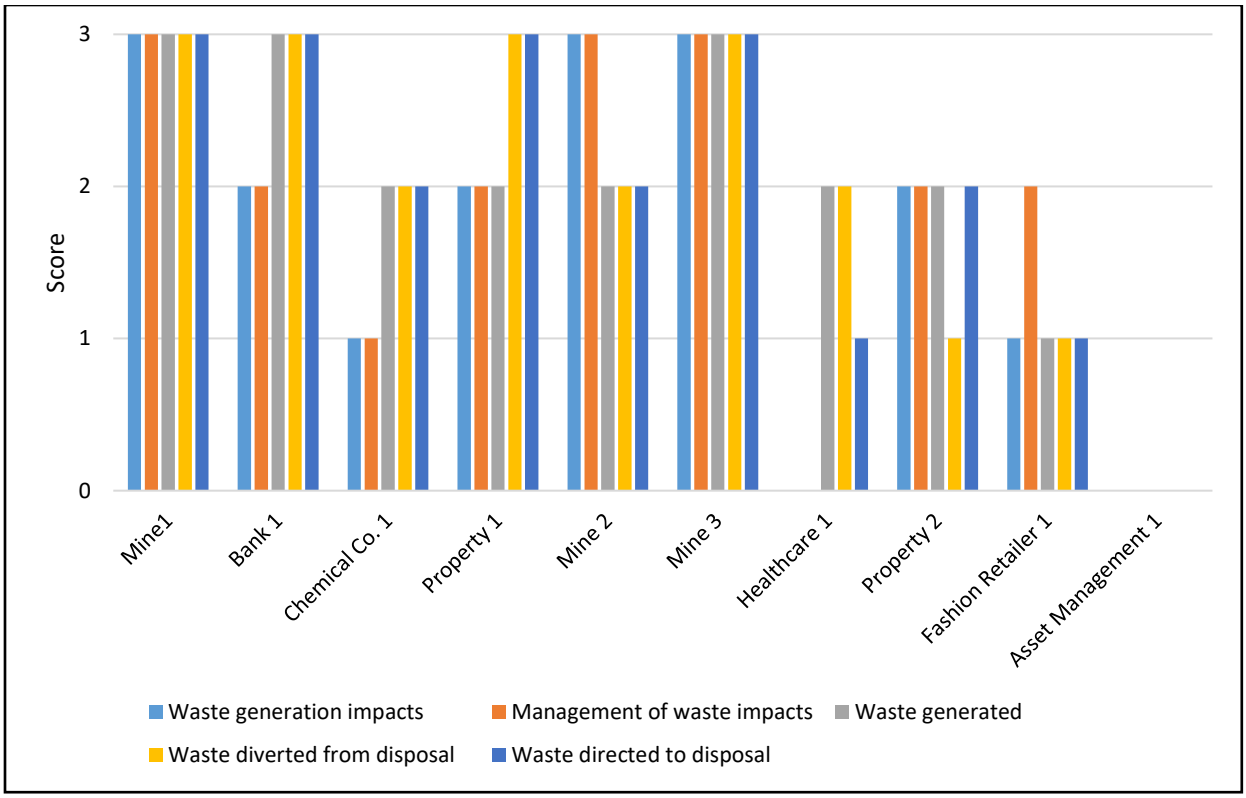

Figure 7 Comparison of responses to GRI Code 306: Waste indicators between the selected JSE listed companies.

The final section that was relevant to this study was GRI Code 303: Water and Effluents where there were five indicators in total (Figure 8). All companies had responded to at least one of the indicators, with 40% of companies responding to all indicators. The indicator with the highest response rate between all companies was “interactions with water as a shared resource”. As part of this indicator, the companies were required to indicate an understanding of the importance of water as a resource for all to share and have access to. Although Asset Management Co. 1 is an asset management company and likely consumes modest volumes of water, it was unexpected that this would not be disclosed by them due to water consumption being a metric that is typically recorded and thus has data available to report on. The median for the three mining companies was 2.5, compared to 1 with the remaining seven companies.

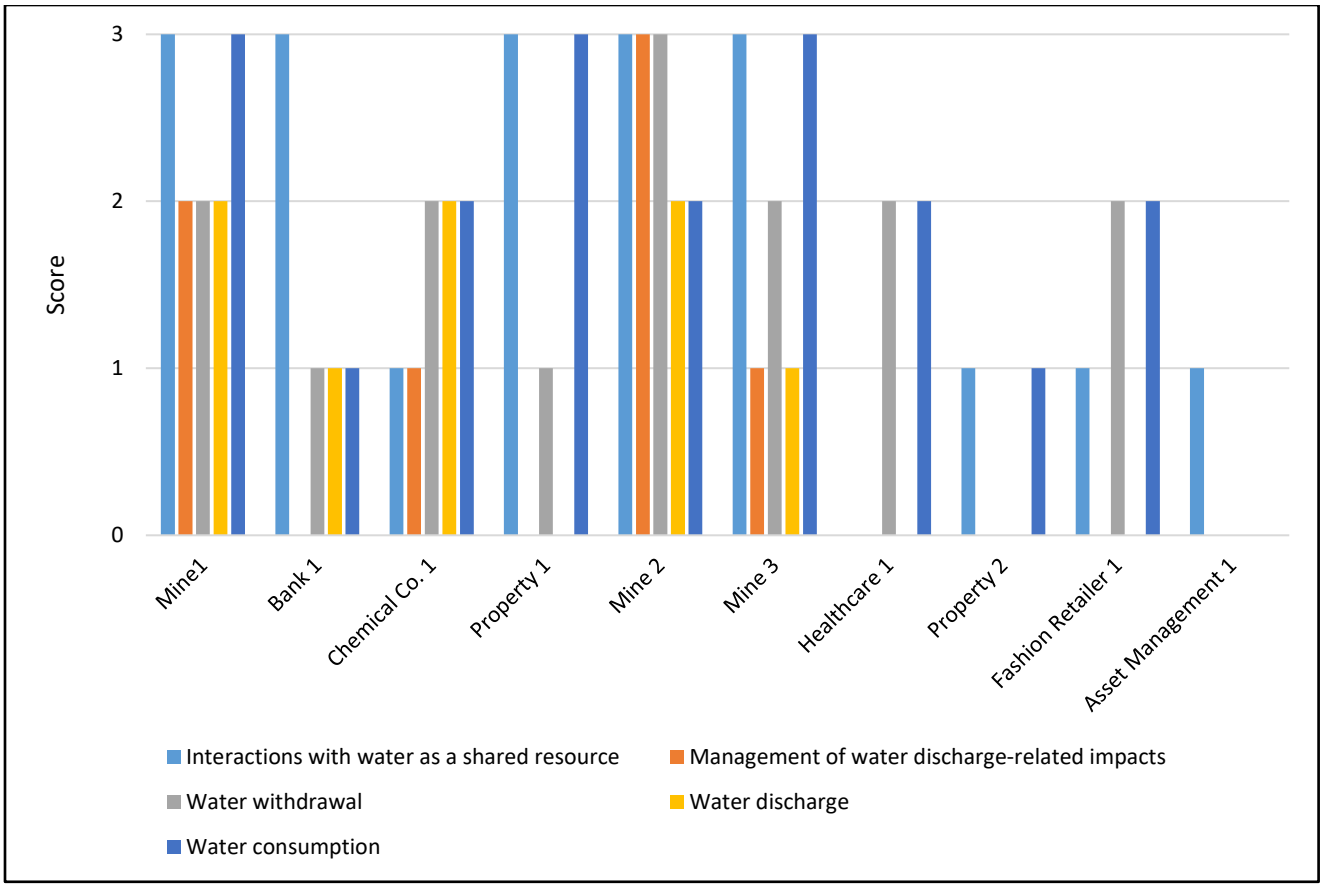

Figure 8 Comparison of responses to GRI Code 303: Water and Effluents indicators between the selected JSE listed companies.

A key point in determining whether the environmental requirements of JSE listed companies are responding to the appropriate global and local environmental concerns and priorities is determining which of these geographical concerns are receiving more attention. 80% of companies had made disclosures that explicitly indicated their alignment to the SDGs and the importance of playing a role in meeting the targets. The remaining 20%, Healthcare 1 and Asset Management 1, did make mention of the SDGs in their sustainability reports, however their statements were vague and no commitments were provided to support their statement. Only 40% of companies had indicated an acknowledgement to the environmental requirements listed in the NDP. In contrast, none of the reports made any statement regarding their environmental disclosures being in alignment or supportive of the environmental priorities and concerns highlighted from the SEOR.

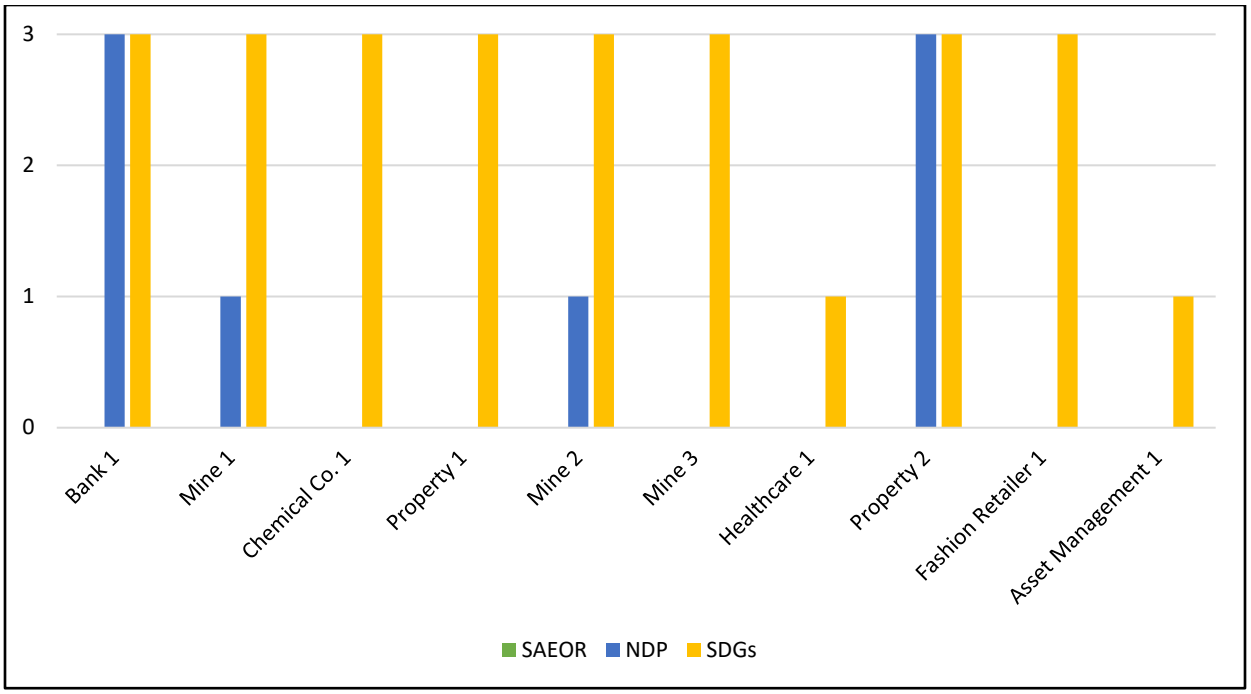

Figure 9 Rating of sustainability reports reference to local (SEOR, NDP) versus global (SDG) environmental priority reports.

4.4 Expert interviews

Interviews were held with four sustainability consultants / advisors who are considered experts in their field due to their years of experience in the sustainable reporting space, and participation of reviewing key ESG guidelines. A common view provided throughout all four interviews indicated that, while there was agreement that the SEOR is a valuable and robust guideline indicating the environmental concerns in the country, it is considered to be outdated. As a result, there was a view that it omits a number of key environmental concerns that the country has faced since its publication. Specific examples that were mentioned were the issue of water scarcity, particularly in water stressed regions, as well as the energy crisis. This view was similarly shared by the participant from the DFFE, however it was noted that while the national SEOR was not updated frequently, municipalities and provinces do collate updated regional and provincial state of environment reports pertaining to their geographical area. It was further stated that these reports are often more detailed and should an entity wish to address a particular environmental concern, it was advised that they refer to a regional or provincial report for relevant information. The DFFE participant confirmed that the SDGs are referred to and incorporated in their provincial reports and risk assessments.

In terms of views regarding the role and level of influence the JSE holds in encouraging ESG disclosure of listed companies, there were differing opinions noted. All four sustainability experts agreed that, while the JSE had provided enough support to listed companies in making ESG disclosures, there was a consensus that the lack of oversight from the JSE likely results in a reduced level of quality disclosure from listed companies. Accountability to the JSE was a recommendation to improve on ESG disclosure quality by three of the four sustainability experts, with one interviewee stating that they believe that the JSE should not be tasked with this responsibility.

When asked if the JSE should be doing more to ensure that listed companies disclose their ESG performance via basic levels of environmental reporting as a listing requirement, one of the four sustainability experts recommended this due to the expectation that, if a company is large enough to consider being listed on the JSE, then they should have capacity to monitor and report on basic environmental indicators such as waste management, water management, biodiversity and climate change impacts. Three of the four sustainability experts believe that there is discussion around the listing requirements already being quite onerous, and the concern is that adding more requirements of reporting for listed or potential listed companies may result in those companies no longer wishing to be part of the JSE itself. Two interviewees were of the opinion that it would not be beneficial for the JSE to put in place any additional environmental or ESG reporting requirements unless there are plans for the JSE to enforce adherence to and accountability for the quality of data being disclosed. One sustainability expert further explained that a potential reason for the JSE not providing reviews or enforcing a certain standard of ESG reporting is due to mandatory compliance with South Africa's laws such as the National Environmental Management Act (Act 107 of 1998), Companies Act (Act 71 of 2008) and the Broad- Based Black Economic Act (Act 46 of 2013) which already cover a number of ESG indicators.

The representative from the DFFE had stated that feedback and support from the private sector in addressing environmental issues raised from the DFFE's risk assessment has been positive. This communication of environmental risks is shared with the private sector via business forums and platforms, as well as regular stakeholder engagement. While the support from the private sector is positive, the representative stated that a common challenge that businesses have raised is a lack of funding and budget constraints. All four sustainability experts stated that they have noted an increase in clients requesting assistance for ESG disclosure, review of integrated annual reports and sustainability reporting. However, they do not believe that this is necessarily as a result of the influence of the JSE, but rather due to increased attention from investors. The four

sustainability experts additionally stated that, even though the JSE does not have any processes to enforce their required environmental and ESG reporting, there is an increase in private companies acknowledging that ESG disclosure reduces their financial and operational risk as a business and are thus more inclined to provide support to disclosure functions within their organisations. This sentiment was supported by the DFFE participant.

Chapter 5: Discussion

The purpose of this study was to evaluate the effectiveness of the JSEs environmental requirements for its listed companies in addressing the local and global environmental areas of concern or environmental priorities that have been documented in the second SEOR, NDP and SDGs. This was done by identifying the key areas of concern addressed in these three reports and then scoring the requirements of the GRI framework against them. The quality of the environmental disclosures in the sustainability reports of ten randomly selected JSE listed companies were evaluated against the GRI indicators. Interviews with a representative from the Department of Forestry, Fisheries and Environment and four sustainability experts were conducted in order to get a more in depth understanding of how priorities are developed and addressed.

5.1 How the GRI indicators address the local and global environmental priorities

The review of the JSE Listing Notice requirements showed no direct environmental requirements for listed companies or potential companies who wish to be listed on the stock exchange. However, since the JSE are aligned to the King Code of Corporate Governance, which then recommends companies to disclose their ESG data per the GRI framework, by default it is mandatory for all JSE listed companies to make specific environmental disclosures based on their business. It is for this reason that this study focused on how only the GRI addresses the local and environmental concerns raised by the SEOR, NDP and SDGs.

While there is a lot of literature on how the GRI is applied at country and sector level around the world, there is limited literature on what or who exactly drives the content within the GRI. From the results on how the GRI addressed the local and global environmental concerns from the SEOR, NDP and SDGs, the GRI had covered 73% of all environmental indicators, with NDP receiving coverage of 75% of its indicators, followed by the SEOR with 73% and SDGs with 72%. This implies that there is a gap where no data are disclosed on 27% of material indicators. The largest gap identified was that the GRI did not address was within the “oceans and coasts” category. This is a category that is discussed in detail by the SEOR as South Africa is surrounded by the coast on the east, south and west of the country. South Africa also has a strong maritime purpose through its transportation and harbour functions, cultures, heritage and tourism, with the oceans economy contributing approximately R54 billion to the country’s gross domestic product,

and a potential of contributing up to R177 billion to the gross domestic product by 2033 (Department of Transport, 2017; Loureiro, Du Plessis & Findlay, 2022). Because its coastal landscape is relatively unique and highly valued, it is a prioritised environmental area for the Department of Forestry, Fisheries and Environment (Department of Environmental Affairs, 2012). It is not unexpected that the GRI does not place as much focus on Oceans and Coasts as an indicator due to its position in trying to cover a number of indicators without being overly prescriptive for a global audience. That being said, an update to the GRI has been announced in June 2022, with a focus specifically on "Agriculture, Aquaculture and Fishing Sectors". This new standard, which will come into effect on 1 January 2024 has been developed due to the impact that the related activities have on biodiversity and climate change (GRI, 2022). While the indicators have not yet been released, it appears that the new standard will drive a more holistic response to impacts on oceans and coastal regions, which should be favourable for South African companies disclosing on ocean and coastal indicators.

Of all 74 indicators, three had received the highest potential score of four, implying that the GRI had done a good job in requiring a holistic approach to the disclosure. Two of the three were from the Air Quality category within the SEOR. The GRI had required not just the tracking of emissions from business travel, but also the measurement and progress towards targets to reduce emissions due to its relation to climate change. Additionally, the SEOR stated a concern about emissions from the country in general. While it is not explicitly stated, this concern likely arises from emissions from our mining industry, which is coal dominated for the provision of the country's electricity (Department of Environmental Affairs, 2012). Due to the SEOR being published before South Africa's energy insecurity and load shedding concerns, the document does not make mention of this as a key area of concern. A positive factor from the GRI is the need to manage down energy consumption, reduce emissions and increase the use of renewable energy not just to manage the energy sector, but due to its integrated links to climate change. The third indicator that scored a 4 was from the SDGs, related to environmental reporting. The JSE responds to this via the GRI as a reporting tool and the requirement of integrated annual reports from all listed companies.

The use of the GRI, while generally widespread across both listed and non-listed companies, still has a number of challenges associated with it, however in South Africa this is not at the fault of the GRI itself, but rather due to the inconsistent application of it caused by lack of oversight (Ngorima, 2019). Shortcomings that have been noted include:

- inconsistent application of disclosures. This can lead to difficulty in comparing or benchmarking data by investors or interested stakeholders;
- incorrect application of disclosures which reduces the quality in addressing environmental issues;
- disclosures omitted without any “apply or explain” clause provided.

It is worth noting that although the JSE themselves do not provide any direct mandatory environmental reporting, they did develop a JSE Sustainability Disclosure Guidance in June 2022 that their companies can adhere to voluntarily. The purpose of this document is to (JSE, 2022):

- provide support to South African companies on the meaning and importance of sustainability and ESG reporting;
- respond to the environmental, social and economic challenges faced by South Africans;
- improve on the quality and standardisation of reporting to assist investors in decision making;
- drive performance and accountability within corporate leadership on sustainability initiatives.

It aimed to consolidate the various sustainability and ESG reporting structures that companies are currently reporting on into one guideline, such as the Carbon Disclosure Project, Taskforce on Climate Related Financial Disclosure, Principles for Responsible Investment, Sustainable Development Goals and Global Reporting Initiative (JSE, 2022; Sustainability expert 3, personal communications, 2023). Its shortcoming is that until it becomes a mandatory requirement with structured oversight into its quality, there is unlikely to be a wide- spread adoption of these guidelines by listed companies as hoped for (Sustainability expert 1, personal communications, 2023; Sustainability expert 3, personal communications, 2023; Sustainability expert 4, personal communications; 2023). Even though its indicators are thought to be more relevant to South Africa by taking into account the country’s specific issues to be addressed, it potentially faces the same shortcoming as the GRI if it does not provide support and reviews for those who are using it.

5.2 How the GRI indicators are addressed by listed companies

There has been an increase in the number of companies that are compiling ESG reports globally as a result of investor pressure, awareness of business risk, alignment to sustainability goals like the SDGs and regulatory requirements (Kolk, 2004; Ioannou & Serafeim, 2017; Sustainability

expert 3, personal communications, 2023). However, interviews with sustainability experts have raised concerns around the quality of disclosure due to there being no authority responsible for viewing mandatory reports, such as Integrated Annual Reports, Sustainability Reports and Global Reporting Initiative reports. Ideally, a response from the JSE related to no reviews being conducted on their mandatory requirements would provide insight into this shortfall, but after numerous attempts at arranging an interview with a JSE representative, this was unsuccessful.

Regarding the evaluation of how effectively the 10 JSE listed companies addressed the GRI indicators relevant to their business, all 10 companies displayed no reporting on at least three of the required indicators. Unlike financial metrics for listed companies, where there are strict regulations to be complied with and adherence to frameworks and financial principles such as the Generally Accepted Accounting Principles, which are audited and have consequences sub- par quality and transparency, there are no such consequences for the reporting of non- financial environmental metrics by any authorities (Ioannou & Serafeim, 2017). A lack in the consistency and standardisation of reporting, variances in quality, transparency of disclosures and inaccessibility of information does not provide valuable insight to interested stakeholders. In addition, the “comply or explain” allowance within numerous ESG disclosures allows companies to explain their reasoning for not disclosing or measuring a specific environmental indicator acts as a form of self- regulation (Ho, 2017).

Based on results from section **Error! Reference source not found.**, the three mining companies had responded to all environmental GRI codes, with the exception of GRI Code 301: Materials and GRI Code 308: Supplier Environmental Assessments where only Mine 2 did not provide a response to any indicator within these codes. The notion that mining companies would perform better than other industries in environmental disclosure is well supported (Jenkins & Yakovleva, 2006; Mudd, 2012; Arthur, *et al.,* 2017). The reason for this is attributed to heavy polluter industries having more and/ or stricter environmental regulations to adhere to and their need to “maintain their legitimacy” in society (Arthur, *et al.,* 2017, p. 3). This concept can be seen in JSE Listing Requirements where it is only the mining industry that is required to take into account their environmental impacts of their operations as a prerequisite to being a listed company on the JSE stock exchange.

The 2021 sustainability report reviewed for the Asset Management Company 1 indicated the least adherence to the applicable environmental GRI indicators, scoring an 8 out of a maximum of 87 points (9%). Asset management companies play a significant role in pushing for the disclosure of ESG reporting. If the asset management firm values ESG, it is more likely to consider investing

in a portfolio that discloses and performs well. In 2016, global investment in sustainable assets had grown by over 25% to $22 trillion globally (Alliance, 2016). In 2020, an Ernst and Young report on Climate Change and Sustainability indicated that 72% of investors now evaluate and review a potential portfolio's ESG disclosure, up from 32% in 2018. While there is a push for "investees" to continue to make quality ESG disclosures, the report notes that the asset management companies themselves display shortcoming in their own internal ESG disclosures and it is recommended that they take more of a leadership position related to disclosure and reporting (Lofts & Meekings, 2021).

Additional results that have been flagged for further discussion are lack of reporting for key indicators in specific industries, or inferior disclosure that do not fully meet the indicator requirements. This was supported by the interview data where sustainability experts noted that the absence of the JSE reviewing their listed companies' adherence to their environmental requirements, i.e. GRI reporting, would likely result in a lower standard of reporting due to no accountability measures in place.

5.3 How the selected JSE listed companies respond to local vs global environmental concerns

The results from evaluating the alignment of the selected listed companies to the SDGs, SEOR and NDP indicated that 80% of the sample have made strong statements in support of the SDGs, with the remaining 20% making vague statements of alignment to the SDGs. Alignment to the NDPs was outlined in 40% of the sampled sustainability reports, of which half had made vague statements of alignment to the NDP. None of the sampled reports made mention of the SEOR. The results revealed listed companies favouring aligning to a global framework of addressing environmental issues via the SDGs which could be attributed to the widespread coverage and constant media attention that the SDGs receive. There is a perspective that companies aligning to the SDGs will see positive change and growth at a macro level, and that the opportunities to leverage scale from global commitments can ensure that initiatives are integrated and sustainable (EY Global, 2017).

5.4 Limitations of research

The following limitations were experienced during this study which affected the comprehensiveness of my conclusions:

- Only publicly available JSE environmental requirements were used in this research. As mentioned in the report, the FTSE4Good Responsible Index is one such ESG review mechanism of the ESG disclosure performance of listed companies, however, since the indicators per industry are not available publically or easily accessible, they had to be omitted from this study
- An interview with the JSE regarding how they apply environmental requirements on their listed companies, levels of oversight (if any) on the disclosures made by their listed companies and their internal review process of what environmental issues are being raised would have been useful to provide context to the study
- The sample size of sustainability consultants interviewed was low (n= 4) due to time constraints
- Although this research was not focused on comparing reporting disclosures among industries, the uneven distribution of sampled industries meant that I was unable to provide a comparison of differences or similarities in how specific companies within an industry disclosed ESG information

5.5 Conclusion and further research recommended

Listed companies in South Africa are required by the JSE to adhere to specific sustainability reporting requirements, underpinned by the GRI framework. While there is little literature found that evaluates the effectiveness of the GRI in responding to various locally developed and globally developed environmental concerns, this study showed that the GRI excels in some areas but performs badly in other. This can be attributed to the GRI being unable to respond to particular unique issues facing South Africa, such as the vast oceans and coastal economy, high range in biodiversity and energy crisis which led to load shedding. However, for environmental issues that are common in a number of countries, such as air quality, waste management, water management and climate change, we see that it sufficiently addresses those concerns per the data evaluated in section 4.2. What has been highlighted in this research is the importance of high quality disclosures. Through the evaluation of the sampled listed company's adherence to the GRI requirements in section 4.3, we can note that improvements in the disclosure is highly

recommended to 1. improve on transparency and 2. provide context to the reader. Environmental reporting and disclosure should be more than a tick box exercise; for it to be valuable there needs to be priorities outlined and action plans developed in order to meet the expectation of disclosure, i.e. a sustainable environment for present and future generations to thrive.

The JSE has played an important role in moving South Africa's reporting requirements forward, making them leaders in the reporting space. However, without a framework of ensuring accountability from its listed companies to make appropriate and valuable disclosures that meet the requirements of the GRI, there will likely continue to be a gap in information provided to interested stakeholders, such as investors, civil society and the public.

The study recommends that future research be conducted to develop a baseline of updated and relevant environmental areas of concern at a national level, but more importantly further studies should be conducted with the JSE to evaluate the quality of disclosure from listed companies should their reporting requirements be mandatory, with consequences for sub- quality of incomplete disclosures made. It would be interesting to note if using the new JSE sustainability disclosure guidelines would result in higher quality and strengthened consistency of listed companies in the future, compared to that of the GRI.

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Annexure A

Table 9: Local environmental concerns identified from South African State of Environment Outlook Report (Department of Environmental Affairs, 2012)

	Category	SEOR Environmental Indicator	Environmental Concern Identified to be Addressed	GRI Based Score
1.	Land	Land cover and vegetation loss	Clearing and harvesting disturbance	0
2.	Land	Soil erosion and soil transportation	Deforestation, overgrazing and fire hazards	2
3.	Land	Contamination of land	Use of fertilizer in natural land	1
4.	Land	Deforestation	Increasing agricultural land, over grazing, illegal timber farming, rapid urbanisation	2
5.	Land	Timber shortage	Unsustainable hardwood timber sourcing practices	1
6.	Land	Acid mine drainage	Mitigation measures to be in place	0
7.	Biodiversity and Ecosystem Health	Over-exploitation	Poisoning of birds, live trade of animals for medicinal use, over-fishing, hunting and poaching, illegal pet trade	1
8.	Biodiversity and Ecosystem Health	Climate change	Lack of understanding related to the importance of ecosystem resilience related to climate change	0

	Category	SEOR Environmental Indicator	Environmental Concern Identified to be Addressed	GRI Based Score
9.	Inland Water	Effective water management	Lack of clean water access and sanitation	3
10.	Inland Water	Vulnerability and climate change	Groundwater management omitted from climate change strategies	2
11.	Inland Water	Water quality	Disposal of chemicals, pesticides and untreated effluent in water bodies	3
12.	Oceans and Coasts	Commercial fishing/ harvesting	Overfishing	1
13.	Oceans and Coasts	Commercial fishing/ harvesting	By- catch of ocean species as a result of unsustainable fishing practices, such as longline and trawl	1
14.	Oceans and Coasts	Industrial waste discharge	Discharge of waste water, sewage and untreated effluent into the ocean	3
15.	Oceans and Coasts	Pollution	Lack of safe practices to avoid accidental oil spills in oceans	1
16.	Oceans and Coasts	Pollution	Disposal of oil based waste into oceans	1
17.	Oceans and Coasts	Pollution	Litter from marine operations	1
18.	Oceans and Coasts	Invasive alien species	Introduction of alien invasive species into ocean environment due to ballast discharge	0
19.	Oceans and Coasts	Sustainable fishing	Increase awareness of sustainable fishing	0

	Category	SEOR Environmental Indicator	Environmental Concern Identified to be Addressed	GRI Based Score
20.	Oceans and Coasts	Sustainable fishing	Greater education for consumers on transitioning towards consumption of sustainable fish species	0
21.	Oceans and Coasts	Sustainable fishing	Educate public on marine conservation practices	1
22.	Air Quality	Emissions	Lack of tracking and reporting of emissions from business travel	3
23.	Air Quality	Energy demand	Reduction in energy consumption (due to SA being so heavily reliant on coal powered energy)	4
24.	Climate Change	Emissions	Reduction of CO_2 emissions	4
25.	Climate Change	Energy	Implement renewable energy programmes	1
26.	Climate Change	Energy	Increase energy efficiency	3
27.	Climate Change	Energy	Set targets for reducing energy consumption	3
28.	Climate Change	Emissions	Report greenhouse gas emissions and changes to emissions intensities through integrated annual reports or sustainability reports	0
29.	Climate Change	Biodiversity	Protection of biodiversity	3
30.	Climate Change	Biodiversity	Protect of coastlines	0
31.	Climate Change	Resilience	Preparation of water shortages as a result of climate change. Requirement of water storage solutions	0
32.	Climate Change	Biodiversity	Introduction and spread of alien invasive species resulting from climate change impacts	2

	Category	SEOR Environmental Indicator	Environmental Concern Identified to be Addressed	GRI Based Score
33.	Climate Change	Adaptation practices	Development of flood and drought management strategies	0
34.	Climate Change	Adaptation practices	Business should be considering science based targets to mitigate the impacts of climate change	0
35.	Energy	Energy	Improve energy efficiency	3
36.	Energy	Energy	Include renewable energy sources into energy supply mix	1
37.	Waste Management	Waste diversion	Increase opportunities of recycling and recycling infrastructure	2
38.	Waste Management	Waste diversion	Follow the rules of the waste hierarchy of preferred disposal methods	3
39.	Waste Management	Waste diversion	Drive separation of waste at source	3
40.	Waste Management	Waste management	Development of special waste strategies for problematic waste streams	3
41.	Waste Management	Reporting	Develop waste quantification reports	3

Table 10: Local environmental concerns identified from the National Development Plan (National Planning Commission, 2012).

	Category	NDP Environmental Indicator	Environmental Concern Identified to be Addressed	GRI Based Score
1.	Economic Infrastructure	Energy	Increase energy availability through renewable sources of power	1
2.	Economic Infrastructure	Water management	Increase accessibility of clean and safe potable water for communities, agriculture and all other industries	3
3.	Economic Infrastructure	Water management	Reduction of urban water demand by 15%	1
4.	Economic Infrastructure	Sustainable infrastructure	Develop building standards for “zero emissions” buildings	0
5.	Environmental Sustainability and Resilience	Biodiversity	Set targets and increase land and ocean space as protected	3
6.	Environmental Sustainability and Resilience	Emissions	Reduce greenhouse gas emissions	3
7.	Environmental Sustainability and Resilience	Waste management	Track and reduce waste generated to landfill annually	3
8.	Environmental Sustainability and Resilience	Climate change resilience	Develop business continuity and disaster management plans to mitigate the impacts of climate change	0

Table 11: Global environmental concerns identified from the Sustainable Development Goals

	Category	SDG Environmental Indicator Category	Environmental Concern to be Addressed	GRI Based Score
1.	Ensure availability and sustainable management of water and sanitation for all	Water management	Reduction of water pollution, dumping of hazardous wastes into water bodies and discharging of untreated waste water	3
2.	Ensure availability and sustainable management of water and sanitation for all	Water management	Increase water quality in bodies of water affected by operations	3
3.	Ensure availability and sustainable management of water and sanitation for all	Water management	Ensure water efficiency in operations and setting goals for water consumption and management	3
4.	Ensure availability and sustainable management of water and sanitation for all	Water management	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	3
5.	Ensure availability and sustainable management of water and sanitation for all	Water management	Decrease water stress on freshwater consumption and withdrawal	3

	Category	SDG Environmental Indicator Category	Environmental Concern to be Addressed	GRI Based Score
6.	Ensure availability and sustainable management of water and sanitation for all	Water management	Water to be managed as a shared resource, with interactions along the water supply chain holding similar goals of water conservation. Water to be managed through an integrated management process.	1
7.	Ensure access to affordable, reliable, sustainable and modern energy for all	Energy	Increase the proportion of renewable energy in total energy consumption	3
8.	Ensure access to affordable, reliable, sustainable and modern energy for all	Energy	Double energy efficiency rate	3
9.	Ensure sustainable consumption and production patterns	Management of sustainable resources	Reporting of material usage, footprint and impacts	1
10.	Ensure sustainable consumption and production patterns	Waste management	Halve food waste values at all stages of production and manufacture	3

	Category	SDG Environmental Indicator Category	Environmental Concern to be Addressed	GRI Based Score
11.	Ensure sustainable consumption and production patterns	Waste management	Reporting, reduction and management of hazardous waste, materials and chemicals through manufacturing process. Reduction of hazardous pollution to air, land and water	3
12.	Ensure sustainable consumption and production patterns	Waste management	Reduce waste generation through diversion from landfill practices, and measure recycling rate and materials recycled	3
13.	Ensure sustainable consumption and production patterns	Environmental reporting	Companies are to align to sustainability practices, and report on sustainability initiatives in sustainability or integrated annual reports	4
14.	Ensure sustainable consumption and production patterns	Management of sustainable resources	Companies are to undertake exercises investigating sustainable production and consumption practices	0
15.	Take urgent action to combat climate change and its impacts	Resilience	Develop business continuity and disaster management plans to mitigate the impacts of climate change	1

	Category	SDG Environmental Indicator Category	Environmental Concern to be Addressed	GRI Based Score
16.	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	Oceans and coasts	Reduction of marine pollution from land based operations and activities	0
17.	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	Oceans and coasts	Overfishing and unsustainable fishing practices	0
18.	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	Oceans and coasts	Increase area of protected marine areas	0

	Category	SDG Environmental Indicator Category	Environmental Concern to be Addressed	GRI Based Score
19.	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	Oceans and coasts	Increase research into sustainable marine practices and technologies that protect marine environments	0
20.	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Land	Increase of sustainable forestry practices, stop deforestation and restore degraded forests	0
21.	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and	Biodiversity	Increase protected areas for mountain based biodiversity	1

	Category	SDG Environmental Indicator Category	Environmental Concern to be Addressed	GRI Based Score
	reverse land degradation and halt biodiversity loss			
22.	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Biodiversity	Coverage by protected areas of important sites for mountain biodiversity	3
23.	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land	Biodiversity	Reduce degradation of natural land, halt the loss of flora and fauna, and prevent threatened species from going extinct	0

	Category	SDG Environmental Indicator Category	Environmental Concern to be Addressed	GRI Based Score
	degradation and halt biodiversity loss			
24.	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Biodiversity	Halt poaching and trading of illegal wildlife or trafficking of any protected species. Products and services must originate from a legal and sustainable supply chain	1
25.	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and	Biodiversity	Prevention of alien invasive species on land or marine resources	

	Category	SDG Environmental Indicator Category	Environmental Concern to be Addressed	GRI Based Score
	halt biodiversity loss			

Appendix A

Sustainability Consultants

1. The State of Environment Report is a really robust, well- defined and useful handbook when it comes to understanding the environmental priorities of the country, as well as areas of concern. The last report was published in 2012, almost 10 years ago. A basic Google search does not display many results on it which makes me think that it has not been as socialized with the industry as it could have been. As a sustainability consultant, how valuable do you think this report is in understanding the country's environmental issues?
2. Do you believe that this report is an accurate review of the country's environmental focus areas and concerns?
3. How do you believe corporate businesses are performing in mitigating environmental issues arising from or caused by their own operations?
4. What can businesses do better to ensure they are addressing the appropriate environmental concerns that they have control over?
5. Do you believe that the JSE is exercising their influence responsibly in ensuring listed companies provide quality disclosure of their environmental initiatives, or do you see the JSEs requirements as being more of a tick box exercise?
6. What do you think can be done to bridge the gap between what we know are the country's environmental priorities and the work businesses are doing now? (Collaboration? Business Forums?)
7. Are South African companies getting better at targeted disclosure in their sustainability reports? What can they do to improve their reporting?

Department of Forestry, Fisheries and Environment

1. The State of Environment Report is a really robust, well- defined and useful handbook when it comes to understanding the environmental priorities of the country, as well as areas of concern. The last report was published in 2012, almost 10 years ago. Are there plans in place to conduct an updated report on a national scale once again? (Perhaps there are new areas of priority, or we could note progress made on current targets)

2. Does the DFFE make reference to the SOER when determining what initiatives to embark on? Is it a tool that is frequently used within the Department? (Trying to establish how important and the impact this report actually has)
3. How do you believe corporate businesses are performing in mitigating environmental issues arising from or caused by their own operations?
4. What can businesses do to ensure they are addressing the appropriate environmental concerns that they have control over?
5. Considering the influence the JSE have on their listed companies, do you see any opportunity in partnering with the JSE to discuss how you can work together to encourage organisations to focus on specific environmental topics that address the country's priorities? (This could be a way to close any gaps between what the DFFE deems as a priority, versus what the JSE requires from its listed companies)