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An investigation into the efficiency of the reporting protocol of environmental incidents in South Africa.

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Submitted: 20 March 2019



This Dissertation is submitted to fulfil the requirements for a Master of Science degree at the Faculty of Science, University of the Witwatersrand, Johannesburg

DECLARATION

I declare that this dissertation is my original work. It is being submitted for the Degree of Masters of Science at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

_____

(Signature of candidate)

Signed on this _____day of May 2019 in Braamfontein, Johannesburg, South Africa.

Dedication

This Masters Dissertation is compiled for all organizations involved in environmental incident reporting. It is written to create awareness on the environmental incident reporting process and to encourage potential polluters to report on environmental incidents as a way of promoting sustainable environmental management. At a time where the state of the environment is constantly declining, organizations and the media are called to play a part in the protection and preservation of our environment for future generations.

Acknowledgments

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I also would like to extend my earnest appreciation to my husband, Charles for his support and understanding throughout the study and my children Jayden and Teana for sacrificing their family time for me to complete this research.

My fellow Environmentalist, Maybe Mudzamiri thank you for proofreading my work.

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Abstract

Environmental reporting has received the attention of many authors both nationally and abroad, however scientific research specifically on environmental incident reporting has been deficient both nationally and globally. This study evaluated the efficiency of the environmental incident reporting protocol of South Africa through identifying challenges and avenues through which effective environmental incident reporting can be pursued to create a baseline for improved environmental management. This study employed interviews, and questionnaires to solicit the research participants' views on environmental incident reporting in South Africa. The National Environmental Compliance and Enforcement Reports were also analysed to understand the institutional framework within which effective environmental incident reporting can be pursued. Judgemental and chain referral sampling techniques were used to identify respondents and content analysis was used for data analysis. The results showed that the percentage of research participants that said improvement was required in the current incident reporting protocol was 23% higher than those who said it was adequate and that of those dissatisfied with the way incident reporting is handled by relevant authorities was 30% higher than those that were satisfied. It was evident from the findings that improvement is required on the current environmental incident reporting protocol to enable efficient monitoring and enforcement. Legislation amendments, awareness programs, establishment of a forum and an Environmental Management Inspectors' support unit was recommended to address the identified challenges on the current environmental incident reporting protocol.

Key Words: Environmental Reporting; Environmental Incident Reporting; Sustainability Reporting; Environmental Incident Reporting Protocol, Integrated Environmental Management; Environmental Pollution; Environmental Protection.

Acronyms

CERES	Coalition of Environmentally Responsible Economies
CESD	Commissioner of the Environment and Sustainable Development
CSR	Corporate Social Responsibility
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DEFRA	Department for Environment, Food and Rural Affairs
ECA	Environment Conservation Act
EIA	Environmental Impact Assessment
EMAS	Eco Management and Audit Regulation
EMIs	Environmental Management Inspectors
EOs	Environmental Officers
ESG	Environmental, Social & Governance
GDARD	Gauteng Department of Agriculture and Rural Development
GEMI	Global Environmental Management Initiative
GRI	Global Reporting Initiative
HPCSA	Health Professions Council of South Africa
IAIAsa	International Association for Impact Assessment South Africa
IEM	Integrated Environmental Management
JSE	Johannesburg Securities Exchange
NECER	National Environmental Compliance and Enforcement Reports
NEMA	National Environmental Management Act
NWA	National Water Act
SACPCMP	South African Council for the Project and Construction Management Professions
SRI	Socially Responsible Investment Index
WCED	World Commission on Environment and Development

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CHAPTER ONE

FRAMES OF REFERENCE

1.1 Background to the study

In the drive for development, environmental challenges have emerged resulting in land degradation, biodiversity loss as well as water and atmospheric pollution (Khuntia, 2014). A great decline has been noted in the state of the environment with a sharp increase in environmental pollution threating the livelihoods of future generations (DEA, 2012). At the same time, the rate at which non-renewable resources are extracted is overwhelming. (Heinberg, 2007). With industries being the greatest contributors to environmental degradation, there is a great need for the establishment of clear policies and strategies for environmental reporting to promote responsible practices among industries.

The environment is increasingly discussed within the context of various disciplines with environmental reporting being one of them (Khuntia, 2014). A significant number of guidelines and literature on environmental reporting is available (Monaghan, 2003). Various voluntary international environmental reporting protocols exist which include the Coalition of Environmentally Responsible Economies (CERES) 1989; Global Environmental Management Initiative (GEMI) 1992; Eco-Management and Audit Regulation (EMAS) 1995 and Global Reporting Initiative (GRI) 1997. Despite the existence of vast protocols, environmental reporting is still in its infancy in terms of development. Laughlin (1999) states that these existing reporting guidelines, protocols, and standards only provide partial or irrelevant information and the full impact of the activities of these companies is hidden. The reporting protocols lack clarity on definitions and content requirements. According to Mathews (1995), lack of uniform or standardized requirements makes comparability difficult and this affects the quality and usefulness of the environmental reports.

The concept of environmental reporting dates back to as far as the 1930s where it was introduced as financial reporting, in the 1970s it developed to social accounting, evolved to environmental reporting in the 1980s to 1990s and has recently progressed to sustainability and total performance reporting (Department of Environmental Affairs and Tourism, 2005). Environmental reporting in South Africa began with the publication of the “King Report on Corporate Governance for South Africa 2001” that spelled out the significance of not only reporting financial issues but environment and social matters and later the Johannesburg Securities Exchange (JSE) established the Socially Responsible Investment Index (“SRI

Index") to assist investors to measure their social and environmental impacts (Department of Environmental Affairs and Tourism, 2005). Despite the progression, Department of Environmental Affairs and Tourism (2005) suggests environmental reporting needs to be legislated to form part of permits or license requirements.

For governments to effectively regulate industrial activities clear environmental reporting guidelines should exist to promote efficient environmental management. It has been noted that very little is known regarding the effectiveness of the voluntary regulatory mechanism, in regulating the utilization of natural resources (Gunningham and Sinclair, 2002). Thus, the provision of clear guidelines for environmental reporting could be essential in providing sufficient information for proper environmental management and ensuring that organizations fulfill their accountability with regard to the environmental burden.

1.2 Thematic Considerations

Increasing industrialization and the reckless exploitation of natural resources have significantly contributed to land degradation, deforestation, contamination of water bodies and atmospheric pollution. These developments have not only adversely affected the present generation but also threaten the availability of natural resources for future generations (Khuntia, 2014). The drive for profit and the over-extraction of natural resources more than they can replenish themselves (Gao and Tian, 2016) as well as the assumption that environmental systems have a self-fixing component (Lin, Li, Li, Huang, Dong and Li, 2012) has to a large extent resulted in observable environmental impacts. Khuntia (2014) states that with the current pace of economic growth, there is an urgent need to ensure wise natural resource extraction through the development of policies and laws for environmental protection.

Rabie (1992) states that South African law has many provisions that aim at dealing with environmental problems. However, despite the array of legislation, there are limited guidelines on environmental incident reporting. The existing guidelines for the control of emergency incidents stipulated in the National Environmental Management Act (1998) and the National Water Act (1998) seem not to give full clarity on what thresholds constitute an environmental incident, who determines what incidents are to be reported and the relevant authorities' process of assessing, monitoring and closing out the incidents reported is not clearly outlined. If the guidelines are not clear it would be difficult for industries to comply with the existing environmental laws which mean many environmental incidents will remain unreported and the environment at large will continue to suffer. According to Rossignol (2015), most of the incident reporting research has focused on safety programs in hospitals or specific types of

installations, like chemical plants and little scientific literature is available to adequately address the environmental incident reporting process. DEAT (2008), also states that, various guidelines exist to address environmental crimes like illegal dumping of hazardous chemical substances, illegal deep-sea fishing, and many others and there are stipulated penalties as well as incentives for whistle-blowers but little is available to encourage industries to report environmental incidents without fear of prejudice and being labelled as criminals. On the other hand, when incidents are reported to the relevant authorities (i.e. Department of Environmental Affairs), little effort is made to ensure all reported incidents are investigated and closed out.

In view of the above, this study sought to evaluate the efficiency of the environmental incident reporting protocol of South Africa through identifying challenges and avenues through which effective environmental incident reporting could be achieved. Furthermore, the study also investigated the institutional and policy frameworks within which effective environmental incident reporting could be propagated, supported and enhanced.

1.2.1 Research Questions

In view of the above thematic consideration the following research questions guided the research process:

i. In what ways do the existing environmental incident reporting guidelines promote effective environmental reporting in South Africa?
ii. What institutional framework exists within which effective environmental incident reporting can be pursued in South Africa?
iii. What are the current barriers that hinder effective environmental incident reporting in South Africa?
iv. In what ways do the reported environmental incidents get actioned and closed out by the relevant environmental authorities in South Africa?

1.3 Research Aim and Objectives

The aim of this research was to evaluate the efficiency of the environmental incident reporting protocol of South Africa through identifying challenges and avenues through which effective environmental incident reporting can be pursued to create a baseline for improved environmental management.

In view of the above aim, the objectives of the study were to:

i. Review the existing environmental incident reporting protocol of South Africa and identify challenges that hinder effective environmental incident reporting in South Africa.
ii. Assess the institutional framework within which effective environmental incident reporting can be pursued in South Africa.
iii. Highlight the current barriers that hinder effective environmental incident reporting in South Africa.
iv. Evaluate how reported environmental incidents get actioned and closed out by the relevant environmental authorities in South Africa.

1.4 Theoretical considerations and literature review

A lot of literature was reviewed to get a feel of the global, regional and local environmental reporting trends. It is evident that environmental reporting is an evolving concept that has been gaining increased momentum in the business world (Lubin and Esty 2010). Unlike financial reporting that is heavily regulated with well-established systems, policies, procedures, and controls, environmental reporting, is largely unregulated (UNEP, 2013). According to Fortes (2002), environmental reporting is important in maintaining or improving competitiveness in today's business environment and it is a way of demonstrating openness about company activities to society at large. Environmental reporting also allows companies to communicate their environmental, social and governance performance, otherwise known as a company's triple bottom line (Roberge, 2010).

It is also evident that ample research has been conducted on environmental reporting both nationally and abroad, however, improvement is required to make the reports more useful. Fortes (2002) states that environmental reporting is currently very poor as reports generated are not comparable. He further goes on to call for improvement to make environmental reporting more useful (Fortes, 2002). A broad perspective of the literature reviewed is outlined in Chapter 2 of this study.

1.5 Methodological considerations

This section is dedicated to presenting a summary of the methodology that was used to achieve the aim of the study. For a detailed outline of methodology refer to Chapter 3. The data sources used for this study included the Department of Environmental Affairs (DEA) and four of its nine provincial departments which are the North West Department of Economic Development, Environment, Conservation and Tourism; Gauteng Department of Agriculture and Rural Development; KZN Department of Economic Development, Tourism and

Environmental Affairs; and the Western Cape Department of Environmental Affairs and Development Planning. The National Environmental Compliance and Enforcement Reports (NECER) and Section 30 of the National Environmental Management Act (NEMA) were also analyzed to understand the existing environmental reporting requirements of South Africa. The non-probability, purposive or judgmental sampling procedure was used for this study.

Interviews and questionnaires were used as data collection tools. Interview respondents were identified through telephonic and email communication with the research organizations where the people responsible for environmental incident reporting were requested to voluntary take part in the interview. The questionnaire survey was created on the Survey Monkey portal and distributed to the targeted respondents through the South African Council for Project and Construction Management Professions (SACPCMP) distribution list. Survey questions focused on the respondents' perception on the existing environmental incident reporting protocol, their experiences on how cases of environmental incidents have been managed, and barriers in incident reporting and also solicited suggestions on how effective environmental incident reporting could be promoted in South Africa. To analyse the text data, inductive content analysis was employed.

1.6 Scope of the Study

The subject of environmental reporting has previously been discussed in a variety of dimensions which include sustainability reporting, corporate social reporting and environmental reporting in annual reports as a JSE listing requirement and limited research has been conducted in environmental incident reporting. This study focused on environmental incident reporting and sought to evaluate the efficiency of the environmental incident reporting protocol of South Africa. The study also investigated the institutional and policy frameworks within which effective environmental incident reporting could be propagated, supported and enhanced. The respondents' selection was limited to people who were directly involved in the environmental incident reporting process within the relevant government environmental authorities (EMIs) and the private industries (EOs). The study was mainly qualitative and the data collected was analysed in a statistical and descriptive manner.

1.7 Ethical Considerations

According to Best & Kahn (2006), ethical considerations have become the cornerstone for conducting effective and meaningful research. The researcher was quite aware of the need to meet all ethical requirements. The researcher used only the information available to the public and no third-party information was required from the participants. The researcher upheld the

conditions set out on the permission letters granted by the study organizations and data collection only resumed after ethical clearance was acquired from the Human Research Ethics Committee (Non-Medical) of the University of Witwatersrand in an Ethic Clearance letter dated: 08 November 2017.

The research was conducted with full compliance of research ethics and norms. Respondents participated voluntarily, no offensive, discriminatory, or another unacceptable language was used in the formulation of research questionnaires, and respondents' privacy and anonymity were guaranteed. Consent forms which stated the overall purpose and the risks or benefits of participating were also completed by the respondents. As required by Bryman and Bell (2011) all authors used were acknowledged. The data collected was not misrepresented or edited and feedback of results was communicated to the respondents on request.

1.8 Structure of the Dissertation

This dissertation is presented in the following structure: Chapter One is the Introduction. This is where the research conceptualization is presented and discussed. Chapter Two is the literature review which outlines and critically engages with both historical and contemporary work related to the current study. Chapter Three is the research methodology where the research area, study population, research tools, and research design is outlined. Chapter Four is the research findings where the outcomes of the research are presented without interpretation. Chapter Five is the discussion and analysis of findings where the findings are interpreted, and the significance of findings clearly defined. Chapter Six is the summary, conclusion, and recommendations where all preceding chapters are summarised, conclusions drawn and recommendations for further study outlined.

CHAPTER TWO

THEORETICAL CONSIDERATIONS AND LITERATURE REVIEW

2.1 Introduction

This chapter is dedicated to a discussion on the theoretical perspectives and literature review that exists on the topic that was investigated. The chapter begins a historical background of environmental reporting and its importance in society as well as the barriers that exist in the process. Thereafter, the global perspective of environmental reporting is discussed, with the context of more industrialized and economically developed countries like Canada, Italy and many others. The chapter then further looks into the Sub-Saharan perspective of environmental reporting with reference to African countries like Nigeria, Zambia, Swaziland, Zimbabwe, and many others. Thirdly, the chapter narrows down to the South African perspective, looking into the introduction of environmental management legislation post the apartheid era. The chapter then concludes with identifying the gaps in existing knowledge and suggestions for future research.

2.2 Historical background of environmental reporting

The term environmental reporting is defined using many different ways and this section will outline a few acceptable definitions of environmental reporting as well as its evolution. According to Pramanik, Shil and Das (2008), environmental reporting is a way that companies use to disseminate information about their environmental activities to various stakeholders which may include employees, communities, shareholders, customers, government and environmental groups. Gray, Owen, and Maunders (1987) also define environmental reporting as a way by which the social and environmental effects of organizations are communicated to the community at large. This communication is a way by which organizations indicate their accountability and responsibility to environmental matters apart from financial reporting requirements (Gray, Owen, and Maunders, 1987). Locally, the Department of Environmental Affairs and Tourism (2005), defines environmental reporting as a concept that encompasses all ways by which companies disclose environmental activities information to stakeholders.

Environmental reporting is said to have evolved from political, social and economic developments influence (Department of Environmental Affairs and Tourism, 2005). Environmental reporting includes, "*country reporting to international conventions, environmental reporting by non-governmental environmental agencies, state of the Environment Reporting at global, regional, national and sub-national level and corporate*

environmental reporting and sustainability reporting and comes in many forms which include health and safety reporting, quality reporting, social responsibility reporting, sustainability reporting and total performance reporting" (Department of Environmental Affairs and Tourism, 2005, p. 4).

Gray (2001) states that environmental reporting began in the 1970s as an experiment that seemed forgotten in the 1980s and later revived in the mid-1990s. He states that it came about as social accounting discussions, where the environment got to be viewed as having a social link that companies had to account for. In an attempt to understand the role of accounting in social ethics, the environment care issue came up. As the subject gained more research interest, the consideration of environmental issues in social accounting gave birth to the inclusion of environmental reports into Corporate Social Reporting (Gray, 2001).

The research interest further grew towards the end of the 1980s and the beginning of the 1990s due to stakeholders' awareness on environmental problems (Clark, 1991; Owen, 1992; Al Naijar, 1993; Deegan and Gordon, 1993; Elias, 1993). In 2000, sustainability reporting further gained significant momentum with the introduction of the Global Reporting Initiative (GRI) guidelines which were introduced to guide the Commonwealth government's reporting initiative (Department of Environmental Affairs and Tourism, 2005). According to Scott (2001) sustainability reporting also grew from traditionally being a voluntary process to a mandatory requirement with several countries introducing mandatory corporate environmental reporting requirements beginning with Denmark in 1996, then Norway, Sweden, and the Netherlands followed in 1999. According to Anon (2004), Australia, the European Union and the USA followed in 2000 and then in 2005 the United Kingdom also joined. To date, social and environmental reporting has gained a lot of attention and the growth has been noted in the inclusion of environmental issues in various companies' annual reports (KPMG, 2013; Mata, Fialho & Eugenio, 2018).

In relation to the above, Gray (2001), indicates that various guidelines for effective social and environmental reporting have been developed since its evolution. However, it is concerning to note that many companies still do not take part in the process, and amongst those that do disclosure remains inadequate (Hilton, 2004). Hilton (2004) further goes on to state that in the UK various companies have not started disclosing their social and environmental impact with specific reference made to companies with infamous reputations or brands, state, and non-state owned and small and medium-sized enterprises. The issue of social and environmental disclosure is also discussed by various authors which include "*Lessem, 1977; Ernst & Ernst, 1979; Dierkes, 1979; Schreuder, 1981; Teoh & Thong, 1984; Guthrie & Mathews, 1985; Gray,*

1989; Gray, 1990; Yamagami & Kokuba, 1991" (Niskala and Pretes , 1995, p.457). In light of these studies, it is evident that environmental reporting is approached differently from one country to another and industry to industry.

Solomon and Maroun (2012), bring to light the issue of sustainability reporting in the picture. They state that growing emphasis has been noted in the call for stand-alone social, environmental and sustainability reporting in annual reports. In a survey conducted by KPMG in 2011, a high percentage (95%) of the world's 200 largest companies surveyed seemed to have included environmental issues in annual reports (KPMG, 2011). Comparably, according to Hughen, Lulseged & Upton (2014), the sustainability reports submitted with the Global Reporting Initiative (GRI) grew in number, with countries the United States of America (USA), China, Japan, Spain, and South Africa being counted amongst high reporters in 2012. Roberts (1992) also indicated that German and Sweden were also amongst leading reporting countries.

In relation to the above, another study was conducted by Yusoff, Othman & Yatim (2013), looking into environmental reporting trends in Malaysia and Australia. In their research, the content and quality of reports for 100 companies were analysed. The findings revealed that environmental reporting was just a paper exercise as the reports did not disclose useful information or show accountability by organizations (Yusoff, Othman & Yatim, 2013).

In another environmental reporting survey conducted by KPMG in 2015, it was noted that environmental reporting was not growing as fast as expected. This slow growth pace was attributed to a lack of mandatory reporting legislation. KPMG suggested that fast growth in sustainability reporting could only be achieved through the introduction of laws mandating companies to report non-financial information. It was observed in the study that, only countries with mandatory reporting requirements, like India, Indonesia, Malaysia, South Africa, UK, France, Denmark, and Norway has high environmental reporting percentages. The reporting requirements in some countries were introduced by governments for example in France, Indonesia, and South Africa and in Brazil, Malaysia, and Singapore the introduction was by stock exchanges (KPMG, 2015). In support of this Kaya (2016) alluded that governments and stock exchanges were increasingly imposing mandatory reporting requirements.

2.3 Barriers in environmental reporting

A number of challenges or barriers exist in the environmental reporting process, and this section will outline a few. According to Boeger, Murray, and Villiers (2008) several barriers exist that hinder the progression of social and environmental reporting which include the lack

of clarity on definitions of the concept, lack of guidelines on what content should be included or excluded on the reports and lack of legislation to guide the process. Tixier (2003) indicates that voluntary reporting has greatly slowed down the development of social and environmental reporting. Tixier (2003) further suggests that the fact that environmental reporting is not mandatory is a challenge as voluntary reporting makes the reports generated by different companies difficult to compare due to varying content. The lack of clarity on the requirements, also render the reports useless as the choice of what to include lies with companies which may make the objectives of reporting not to be achieved (Tixier, 2003).

Companies may use the reports to portray a good image rather than providing an accurate assessment of the company's environmental performance. Hence the call for standardized requirements to ensure the reports generated by companies are easily comparable (Villiers and Staden, 2006). Prior research suggests that companies only report and magnify positives and negatives are swept under the carpet (Bell & Lundblad, 2011; Hahn & Kuhnen, 2013; Sonnenberg & Hamann, 2011). In this light, similar sentiments are shared by Boeger, Murray and Villiers (2008) who state stating that social and environmental reports are usually used as self-congratulatory documents that emphasize the company's successes, emphasizing the good and hiding the bad. They further go on to state that this usually affects the quality of the reports and little useful information is gathered from them. They also mention the lack of legal requirements as a contributing factor to ineffective enforcement mechanisms to guard against failure to provide social or environmental information.

Research also suggests that companies tend not to participate in environmental reporting to protect their corporate image. Tixier (2003) suggests that in some instances, companies resist reporting because of fear that reporting would lead to resentment and suspicion of their motives and such reports can actually lead to discontent among stakeholders. In this context companies then decide to be discreet fearing reputational damage (Tixier, 2003). In addition to this, Solomon and Lewis (2002) also point out various reasons for the non-disclosure of environmental information citing reluctance to report sensitive information, lack of legislation and fear of providing competitors with information that may be used against them.

To address these barriers to environmental reporting Boeger, Murray and Villiers (2008) indicate that clear objectives are necessary for social and environmental disclosure to achieve its objectives of improving the behaviour of companies and making them accountable for their actions. Environmental responsibility, a company could be exposed to financial penalties when it fails to meet environmental performance targets or if its operations cause damage or pollution to the environment. Related to this, Ferman (1992) indicates that, it is from this

perspective, that reporting and disclosure arguably increase awareness both by the company and by the public recipients of the information and businesses will more likely avoid questionable environmental practices.

Sridhar and Jones (2012) also state that unlike financial reporting which is able to address fundamental, universal and largely timeless principles of profit and loss, assets and liabilities, environmental and social reporting needs to be adaptable to the changing environment in which companies operate. They further go on to indicate that reporting should be geared towards enhancing the understanding of the actual workings of a company with information that is relevant, comparable and which enhances the ability of management to act, while simultaneously providing stakeholders with a clear understanding of the impacts that companies have and the pressures to which they are exposed. This may be an impossible dream but the rise of a number of sustainability tools that seem closely linked to sustainability reporting may offer a path to real and useful reporting (Baumgartner & Winter, 2013).

2.4 Contextualizing the literature on environmental reporting: A Global Perspective

This section presents the environmental reporting practices of developed countries. Growth of awareness in environmental issues has been noted worldwide (Contrafatto, 2014). Environmental accountability started with the Maastricht Treaty in 1992 where the European Union declared in the inclusion of environmental issues into policies and activities and since then, an increase in environmental protection initiatives was observed. These initiatives include environmental or sustainability reporting where companies are required to disclose information on the environmental impacts and environmental protection strategies when reporting.

In developed countries, environmental reporting has been increasing, with countries like the Netherlands and France legally mandating companies to report on their environmental impacts. In these countries, environmental accountability is encouraged and companies are encouraged to reduce environmental impacts in their activities (Drieenhuizen, 2001). France was the first country in Europe to adopt legislation around sustainability reporting in 2001 and now has mandatory reporting requirements like the Grenelle Acts of 2009 and 2010. These Acts made the inclusion of CSR matters in annual reports mandatory in France and have deniably improved the non-financial corporate communications (KPMG, 2015). According to Kaya (2016), the French legislation on sustainability reporting would be a good example to be adopted for the harmonization and convergence of reporting standards.

Uwuigbe, Jafaru and Ajayi (2012) state that though reporting requirements are still not mandatory in many countries, an increase in reporting has been observed globally over the past two decades. They further state that environmental reporting is growing in developed countries like the United Kingdom, Australia, and New Zealand compared to developing countries due to the voluntary nature of reporting in these countries. It is also evident from literature that, there is heightened interest in environmental reporting in developed countries with examples including "*Patten, 2002, Frost, Jones, Loftus, & Van Der Laan, 2005, Gray, 2006b, Burritt and Schaltegger, 2010, Gurvitsh and Sidorova, 2012 & Greiling, Traxler and Stotzer, 2016*" (Kamala *et al.,* 2015 p. 31).

A lot of environmental reporting research has also been conducted in the Australian setting. Developed countries like Australia have many sources of environmental protection legislation (Deegan and Shelly, 2014). Lynch (2010) conducted a study to assess the state of environmental reporting among Australian public departments over an eight-year period. The study revealed an increase in environmental disclosure over the period studied however the disclosure practices among departments were different and reporting was inconsistent which made comparing the reports of one department to another more difficult.

Another developed country that has shown a lot of commitment to environmental reporting in Canada. Since the World Commission on Environment and Development (WCED) in 1987, all federal, provincial and territorial governments in Canada made commitments to achieve sustainable development in international, bilateral, provincial and regional forums. Canada is a signatory to over 100 international environmental concords with examples of the Rio Declaration on the Environment and Agenda 21(Commissioner of the Environment and Sustainable Development (CESD), 2008a). A study conducted in the context of Canada by Ellis *et al*. (2013) to assess the reporting practices of the Canada governments revealed that environmental reporting promotes government accountability and provides important and relevant information to stakeholders. Though environmental reporting seemed to be good in Canada opportunities for improvement were identified (Ellis *et al*., 2013).

2.5 Benefits of environmental reporting

The environmental reporting drivers vary from country to country and this variation is depended on available legislation and requirements. According to Wheeler and Elkington (2001), the main drivers for environmental reporting in Europe include the "*duty to the environment, public relations, gaining a competitive advantage, and legal compliance*". In North America "*shareholder pressure seemed to be more significant than legal compliance*".

In Japan, reasons included "*consumer and shareholder pressure, campaign interest groups, environmental duty, and public relations"* (Wheeler and Elkington, 2001). Environmental reporting also brings about a number of benefits which include, improved organizational reputation, enhanced transparency, accountability, and responsible governance and enhanced communication with stakeholders. It also contributes to the wider education of the public, improves risk management and helps in the identification of potential opportunities for the reduction of resource use and operating costs (Wheeler and Elkington, 2001). In addition to that, environmental reporting also improves customer confidence and exposure as well as the organization's competitive advantage (Merrick and Crookshanks, 2001, Australian Government, 2004).

Environmental reporting also plays an important role in environmental protection. Since industries are a major contributor to environmental degradation, land transformation and climate change, and depletion of natural resources, it is critical that companies operate in a sustainable manner in a system with limited natural resources (Maubane *et al.* 2014). The combined effort of industries to reduce their environmental impact is critical, not only to avoid reputational damage and save costs but more importantly to avoid endangering society and remain in business as industries will not be able to operate if resources, such as freshwater, are depleted. According to Kuhnen and Hahn (2013), to stabilize the environmental abnormalities, adjustments need to take place in the way society operates and industries need to be accountable and transparent in demonstrating their responsibility towards improving environmental resilience. Similarly, Jones (2010) shares the same sentiment that industries have a duty to act given their great impact on the environment.

Ortas and Moneva (2011) suggest that through environmental reporting companies can be held accountable for their environmental impacts and the public can be informed on matters that affect their environment. The Japan Ministry of Environment (2004) suggests that organizations should demonstrate their accountability through reporting their environmental impacts, efforts to reduce the impacts, and environmental conservation strategies. Environmental reporting also provides a significant tool for communicating environmental information (Japan Ministry of Environment, 2004). Above what is expected from individual organizations, governments have a huge responsibility to drive sustainability reporting. Countries can benefit from being affiliated with international organizations that promote environmental protection. Examples of these international treaties include The Rio Declaration and Agenda 21. These calls on governments to play an active role in environmental protection.

According to Hildebrandt (2013), the Rio Declaration on the Environment contains the fundamental principles of the agreed approach to sustainable development. For instance, in principle 10 the issue of the provision of public information on environmental sustainability is discussed. It is within this principle that the public rights to information about their environment are enshrined (United Nations, 1992). It is also within this principle that governments are called to make environmental information widely available to the public. Chapter 40 of Agenda 21 also encourages governments to adopt national accounting practices and measures that promote sustainability. Therefore, for governments to meet their commitments to sustainable development, environmental sustainability should be prioritized (European Union, 2011). Governments should also be accountable to all citizens for government decisions, activities, and performance (Barton, 2005). This accountability can be shown through the development of policies and legislation that promote effective environmental management.

2.6 Contextualizing the literature on environmental reporting: A Sub Saharan Perspective

Despite the growing research interest in environmental reporting globally, developing countries seem to be lagging behind. Environmental reporting is well researched in developed countries as evident in the above section and limited research is available for developing countries (Sahay, 2004, Sumiani *et al.,* 2007, Khan *et al.,* 2011). According to Dissanayake, Tilt, and Lobo (2016) developing countries, unlike developed countries are characterized by high population and rapid industrialization which presents adverse social and environmental effects like land degradation, pollution, poor management of water resources, loss of biodiversity, coastal erosion and poor industrial waste management. Despite these challenges, matters of environmental accountability and reporting still need a lot of attention (Guobadia, 2000).

In a study conducted in the context of Nigeria by Uwuigbe and Olayinka (2011) to investigate environmental reporting disclosure by the brewery and building material industry. The findings revealed a notable difference in environmental disclosure by different industries in Nigeria and showed that environmental reporting in Nigeria was still at its infancy and requires a lot of attention (Uwuigbe and Olayinka, 2011). In relation to the above, another study was also conducted by Asaolu, Agboola, Ayoola, and Salawu (2012) to assess the state of environmental reporting in Nigeria. It was revealed that environmental reporting in Nigeria was not legislated and reports varied amongst different companies. The study also revealed that environmental reporting still needed a lot of attention in Nigeria. Further research also showed that environmental reporting in Sub Saharan countries was lagging behind. According to the

second annual Africa ESG Investment Forum (2012), the Sub Saharan corporate disclosure is very weak in dealing with environmental issues such as energy consumption or pollution. Most disclosure is done for listing requirements and does not put environmental accounting at the forefront. Environmental reporting is mainly done in a haphazard way (Beredugo and Mefor, 2012).

According to Kabir and Oni (2007). unlike in developed countries, (*see,* for example, Amran and Devi, 2008; Das Gupta and Das Gupta, 2008; Ratanajongkol *et al.*, 2006; Araya, 2006; Kuasirikun and Sherer, 2004) limited studies have been conducted in environmental reporting for developing countries. Little literature is available for developing countries such as Malaysia, Thailand, Brazil and India and African countries such as South Africa, Libya, Nigeria, Tanzania, Ghana, Mali, Swaziland and Zambia (Pratten and Mashat, 2009; Ofori and Hinson, 2007; Kabir and Oni, 2007).

According to the Zimbabwean Newsday, 2017, many companies have been found on the wrong side of the law by being only obsessed with reporting financial issues minus the environmental ones. Those companies may actually not be the bad ones because they cared to report on something at least, where most companies in developing countries seem not to care about reporting their activities, worse still share their activities with the public. As such, their activities are shrouded in secrecy, while the environment suffers from toxins, greenhouse gas emissions, degradation and destructive tendencies of any nature. For quite a long time, humanity and aquatic creatures have borne the brunt of toxic pollutants, discharge of industrial waste into streams, rivers, lakes, and seas, as well as release of mine dust into the residential arrears without any form of compensation. Hence the need for sustainability reporting which can act as a powerful change agent (Zimbabwean Newsday, 2017).

Similarly, according to the Zambian Daily mail, 2015 the concept of sustainability reporting has not yet been fully appreciated in Zambia and initiatives are underway to promote environmental reporting by public companies. Though sustainability reporting is promoted in the Lusaka Stock Exchange more still needs to be done in Zambia (Zambian Daily mail, 2015).

In the same context of Sub-Saharan Africa, Mawanza and Mugumisi (2014) conducted a study related to environmental reporting where the adoption of 'triple bottom line reporting' reporting by companies was assessed. The results showed a growth in the adoption of the triple bottom line reporting though not to a satisfactory standard as the quality and uniformity of the majority were still poor. In some of the reporting, the researchers noted elements of bias by companies of reporting only the goodies of their operations in the social and environmental platforms.

Mawanza and Mugumisi (2014) study also showed that environmental reports between different companies and sectors were not uniform. Some sectors reported more than the others, for instance, mining, beverage, food processing, and building and associated industries' sectors. They further went on to say that laws mandating environmental reporting in Zimbabwe were not available which made the reports generated voluntarily by companies inconsistent and of poor quality.

2.7 Contextualizing the literature on environmental reporting: South African Perspective

This section presents the environmental reporting practices and their evolution in South Africa. According to the Department of Environmental Affairs and Tourism (2005, p. 4), environmental reporting seeks to encourage industries to improve their social and environmental performance by adopting voluntary initiatives, for example '*environmental management systems, codes of conduct, certification and public reporting on environmental and social issues'*. In South Africa, the birth of a formal process of environmental reporting started with the publication of the South African Institute of Directors' "King Report on Corporate Governance for South Africa 2001". The King report presented a set of guidelines that guided how financial and non-financial matters such as health, safety and environment, ethics, social issues and the importance of reporting the non-financial matters had to be managed (Department of Environmental Affairs and Tourism, 2005). These guidelines were followed by the launching of the JSE, Socially Responsible Investment Index ("SRI Index") in 2004. This was used to promote social responsibility among JSE members where their performance in non-financial matters was measured. With this, the concept of the "Triple Bottom Line" was introduced. This triple bottom line according to Slaper and Hall (2011, p. 4) "*is basically the measuring and reporting of a business' performance with respect to its people, planet, and profit which broadens the business focus to include social and environmental aspects as part of good corporate citizenship and governance".*

Though the formalization of Environmental reporting started in 2001, legislation that promotes Environmental protection in South Africa had long begun around the late 1980s with the first being the publishing of the Environment Conservation Act in 1989. This legislation introduced tools like the Environmental Impact Assessments (EIA) which were by the time voluntary until mandated in 1997 (Steyn, 2001). Steyn (2001) suggests that before 1989 Environmental Management in South Africa was singularly focused with only issues of environmental degradation prevention prioritized and areas of pollution avoidance were neglected. He further

goes on to suggest that sustainable development around the 1980s was not considered of importance (Steyn, 2001).

It is suggested by Department of Environmental Affairs and Tourism (2005), that environmental reporting began to gain momentum in the early 1990s, which is when various South African companies began to produce environmental reports. The idea of Environmental Reporting Awards now known as the Sustainability Reporting Awards also emerged in the same period. These awards contributed to environmental reporting growth as most companies began to show interest. Other companies even took it a step further by adopting the ISO 14001 standard for environmental management systems (Department of Environmental Affairs and Tourism, 2005). The Department of Environmental Affairs and Tourism (2005) states that despite the noted progress, not all companies are comfortable with the process as very few companies have shown success in reporting.

In South Africa, the state of environmental reporting is also looked at in terms of the Pre- and Post-apartheid era with the post-apartheid being after the year 1994. According to Hamann *et al*. (2000) and Khan (1998) the environmental policies during the apartheid era were unjust to the poor and were designed to maintain inequality and incapacity. They further go on to state that, a wide population was discriminated from participation in political decision-making and never had a voice in conservation matters. During this period of conservation, people were dispossessed of their land in the name of conservation, for example, game reserves were established and people were forcibly removed from their ancestral land. In the process of land dispossession, the environment suffered severely (Hugo *et al,* 1997; Wood, 1999). It was also through them that a majority of South Africans developed a negative attitude towards environmental conservation and management (Hamann *et al.*, 2000). It was only through the political change in 1994 after the first democratic elections, that laws, with environmental law included, were reformed. The new Constitution was then published in 1996 bringing about a change in environmental policies (Hamann *et al.* 2000; Glazewski, 1999).

The Constitution of the Republic of South Africa laid a foundation for fair environmental management in South Africa. According to Henderson (1996), this marked the beginning of regarding environmental rights as decided in the highest law court of the land. Section 24 of the Constitution contains comprehensive protection of environmental rights where it is stated that “Everyone has a right to an environment that is not harmful to their health or well-being; to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecological sustainable development and use of natural

resources while promoting justifiable economic and social development." Section 32 also states that “Everyone has the right of access any information held by the state; any information that is held by another person and that is required for the exercise or protection of any rights." Access to information is critical in community empowerment, to give them a voice in matters affecting their environmental justice which is a right that South African people did not have pre-1994. It is through these two sections that environmental reporting is now promoted as evident in the wealth of literature in environmental research post-1994 (Hamann *et al.* 2000; Barnard, 1999).

As environmental management further evolved, the concept of Environmental Impact Assessment (EIA) was born in South Africa. An EIA Committee of the Council for the Environment was then set up in 1983, which advocated for EIA research in South Africa. This research led to the birth of Integrated Environmental Management (IEM) in 1989 developed to support EIA which had been seen to be shallow in scope (Hamann *et al.* 2000). In the late 1980s, IEM was further developed and a revised IEM procedure was then published in 1992 (South Africa, 1992).

The Environment Conservation Act (ECA) remained the most important piece of legislation until 1998 where its shortcomings of environmental management and conservation were realized (Hamann *et al.* 2000). The National Environmental Management Act (NEMA) of 1998, and the National Water Act (NWA) of 1998 were then introduced to address in gaps identified in the ECA (Baloyi, 1999). It is under these pieces of legislation that guidance on reporting environmental incidents is also provided, however as alluded by Lochner, (2005), efficient implementation of legislation is required to ensure quality and consistency of professional reports.

Other documents that emerged in support of environmental protection were the 1998 National Strategy for IEM and the 1999 White paper on Environmental management policy which presented Environmental Management principles for promoting good environmental management practices (South Africa, 1998b; South Africa, 1999). In addition to that, South Africa is also part of the international agreements like the Rio Declaration and Agenda 21 (DEAT 2006).

According to De Villiers and Bernard (2000), a sharp increase in environmental reporting was noted in the post-apartheid era between 1994 and 1999, (see, for example, De Villiers and Van Staden, 2010; Vos and Reddy, 2014; Kamala, Wingard and Cronje, 2015). “*This increase was attributed to the international market pressure that compelled the companies to raise their*

environmental reporting practices which had fallen far below the international best practice as a result of the country's prolonged period of political isolation" (Visser, 2005 p. 29). De Villiers and Van Staden (2010)' study on environmental disclosure needs, revealed that shareholders required companies to disclose issues like 'environmental risks and impacts, environmental policy, measurable environmental targets, performance against targets, environmental costs, and an independent environmental audit report'. The study recommended a change in disclosure laws (De Villiers and Van Staden, 2010).

Despite the increase in environmental reporting research in the post-apartheid era, leadership was still not reflected in the quality of environmental reporting in 2011(KPMG, 2011). Struwig and Janse Van Rensburg, (2016, p.1) state that *"though South Africa is one of the few emerging-market economies showing a significant increase in sustainability reporting, more still needs to be done for sustainability reporting to maintain its integrity and value".* They further go on to state that there is a need to critically evaluate sustainability reporting in South Africa against international standards (Struwig and Janse Van Rensburg, 2016).

A study was conducted by Vos and Reddy (2014) to assess whether environmental reporting in annual reports was promoting sustainability. The study revealed that little sustainability information was disclosed by companies. This finding is supported by Hughen, Lulseged & Upton (2014) who state that despite the increase in a number of reports, companies are discreet in their environmental reporting. Maroun (2016), in support of these findings also stated that environmental reporting in South Africa does not link social, human, manufacturing and environmental impacts and attributes this shortcoming to lack of the 'how to do' knowledge. In another related study Kamala, Wingard and Cronje (2015) looked into how the quality of environmental reports would have improved. The study revealed improvement in quality and number of environmental reports. If in 2015 notable improvement was observed in environmental reporting then it can be concluded that the future of environmental reporting in South Africa is 'promising and exciting', looking into the increasing demand for environmental information by stakeholders and the ability to access the information free and easily on the internet (Kamala, 2015).

2.8 Contextualizing the Gaps in Knowledge

A lot of research may have been conducted on environmental reporting both nationally and abroad, it is evident that improvement is still required for reports to be more useful. As indicated by Deegan (2017), the quality of reporting is still lagging behind. Even with positive growth in environmental related initiatives, environmental damage still persists, many people

are still being displaced and the state of the environment is further deteriorating. Species extinctions, climate change, deforestation, desertification, land and water pollution and overpopulation is still a problem (Intergovernmental Panel on Climate Change, 2014; Garnaut, 2011; Stern and Stern, 2006).

In such a time where environmental reporting as a tool to promote environmental protection is needed the most, Degaan (2017) suggests that companies are still not cooperating in terms of environmental accountability. In the presence of all the good reporting in annual reports, no improvement has been observed in environmental reporting (Deegan, 2017). This lack of accountability is attributed to a lack of legislation to guide the environmental reporting process. Environmental reporting, when compared to financial reporting, lacks regulation, it relies mainly on voluntary reporting despite its importance (Gray *et al*., 2014). Efforts made to legislate environmental reporting is usually marred by opposition from business organizations "citing that legislation would inappropriately introduce a 'one-size-fits-all' approach to reporting" (Deegan & Shelly, 2014). Environmental reporting is also thought to hinder innovation and increase compliance costs, and as suggested by Owen, Shaw, & Cooper (2005) such claims seem to be unfounded.

Several barriers that hinder effective environmental reporting have also been discussed as stipulated in Section 3.2 of the study which include, the lack of clarity on definitions of the concept, lack of guidelines on what content should be included or excluded on the reports, lack of standardisation and use of the environmental reports as self-congratulatory documents where the good is only reported and the bad is hidden (Boeger, Murray, and Villiers, 2008; Tixier ,2003; Villiers and Staden, 2006). Fear of reputational damage, fear of clean-up costs and fear of providing competitors with information that may be used against companies were also identified as barriers to effective environmental reporting (Solomon and Lewis, 2002).

Therefore, considering these challenges identified in literature, this study will evaluate the efficiency of the environmental incident reporting protocol of South Africa and propose frameworks within which effective environmental reporting, specifically incident reporting, can be propagated, supported and enhanced. The present study will also contribute to the existing literature by offering new insights on how the environmental incident reporting process can be better managed and challenges that exist addressed. Further research into this subject, by means of case studies and examining international, regional and national policies on environmental incident reporting may be useful in promoting effective environmental incident reporting in South Africa.

CHAPTER THREE

METHODOLOGICAL CONSIDERATIONS

3.1 Introduction

Methods of inquiry, or research methodology, determine both the kind of data collected and the types of data analysis which need to be employed. The research methodology is a vital element of any research as the methods chosen must be able to yield data that can answer the research question. For a study of this nature various research methods may be applicable, however, this section outlines the methods used specifically for the objectives of this study to be achieved. According to Alshenqeeti (2014), research methods in social science research form an important part of any research project and the way they are applied determines its success, validity, and reliability. Related to the above, Schulze (2003), also states that diverse research methodologies are available that can be applied to different research areas. He further goes on to state all research methodologies have their own advantages and disadvantages (Schulze, 2003). Myers (2013) then outlines that research methods can be grouped into qualitative and quantitative, where the former refers to the kind of research that generates text data and the former being more statistical and concerned with quantities. In this study, methodology refers to the way this research was conducted to achieve this study objectives, which was evaluating the efficiency of the environmental incident reporting protocol of South Africa through identifying challenges and avenues through which effective environmental incident reporting can be pursued.

This study was qualitative in nature and was more focused on qualities rather than quantities and is often designed to generate a deep understanding of meanings, processes, and reasoning. According to Meanwell (2017), interviews, focus groups, ethnography, and content analysis are widely employed in qualitative research to collect data. Qualitative research can be time-consuming; however, it presents a lot of advantages that include, full involvement of the researcher throughout the study, flexibility and rich data is collected in the form of comprehensive written descriptions and visuals (Kothari, 2008). According to Kielmann, Cataldo, and Seeley (2012), qualitative research is more in the constructivist research approach.

This chapter resumes with explaining broadly the research approaches that exist in social sciences. Thereafter, the research design, population, and sample are described. It also describes how the data was collected and analyzed and concludes with a reflection on all the methods that were intended to be employed in this study.

3.2 Research approach

For a study of this nature, there are so many research approaches that can be used, ranging from post-positivism, pragmatism, transformative and constructivism as outlined by (Guba, 1990). A research approach is defined as "*a plan and procedure that consists of the steps of broad assumptions to detailed methods of data collection, analysis and interpretation based on the nature of the research problem being addressed" (*Chetty, 2016, p. 1). According to Tuli, 2010), the research approach guides the research activity, and is focussed specifically on people's beliefs about the nature of reality and humanity (ontology), the theory of knowledge that informs the research (epistemology), and the way the knowledge may be acquired (methodology).

The post-positivist approach emanated from positivism, which suggests that research was objective and that the researcher's personal view of issues did not interfere with the way the research was conducted and interpreted. This research paradigm is widely used in quantitative research (Teddlie & Tashakkori, 2009). Ontologically, post-positivism has viewed reality as singular with the research aiming generally to accept or reject a hypothesis using numeric data (Creswell & Plano Clark, 2011). Trochim (2006) also introduces a post-positivist philosophy called critical realism which suggests that there is a reality outside what humans can imagine that can be explored by science. The post-positivist also holds a belief that all observations are based on theory and everyone's view or experiences can affect the way research is conducted (Trochim; 2006).

In the pragmatic approach, the most suitable research method is used (Feilzer 2010). De Vos, According to Delport, Fouche & Strydom (2011), in a pragmatic approach, researchers are free to adopt any method they deem relevant to their study realizing that all methods have their advantages and disadvantages. In this approach, a combination of research methods is acceptable as long as answers to the research questions will be acquired (Johnson & Onwuegbuzie, 2004). Ontologically, pragmatists believe that there are many views of social realities (Creswell & Plano Clark, 2011). They focus on facts about the research questions and do not bother about research approach wars (Tashakkori & Teddlie 2003).

According to Mertens (2010, p. 470), the transformative approach is mainly group or community orientated and is centred on various theories like the "*Marxism theory, critical theory, feminist theories, Freirean theory, race-specific theories, and post-colonial theories*". The transformative approach is more focused on community empowerment and does not believe in myths. It employs both quantitative and qualitative research methods. In the

transformative approach, participants play an important role in the research through problem identification and the whole research process (Mertens, 2010).

This current study is best situated in the constructivist approach. According to Scotland (2012), in constructivists reality is inexistent, and interpretations are sort in everything. Constructivists commonly make use of qualitative research methods (Scotland, 2012). The constructivist approach originated from Edmund Husserl and Wilhelm Dilthey and other German philosophers' studies (Mertens, 2005). Constructivist approaches are more socially orientated (Cronin, Coughlan, and Smith, 2014). Creswell (2009) states that constructivists are more reliant on participants' views, experiences, and background regarding the study subject. Similarly, this study relied upon the Environmental Management Inspectors and independent consultants' knowledge and experiences in environmental incident reporting in their relevant governmental and non-governmental departments.

Creswell (2009) further goes on to state that constructivists, unlike the transformative approach, are not theory dependent, they generate their own theories based on the research output. Interpretivists prefer flexible rather than firm research formations (Carson *et al*., 2001). Interpretivists believe in inter-reliance between the researcher and the participants. They also resume research pre-informed but are able to remain open to new discoveries throughout the study (Edirisingha, 2012). A similar approach was adopted in this study where the researcher presented herself with little knowledge and fully relied on respondents who were field experts to learn more about the environmental incident reporting protocol of South Africa.
Interpretivists have been criticised for subjectivity (Maroun, 2012). However, this subjectivity can be minimised by efforts to acknowledge any biases or expectations in the study at hand (Leedy & Ormrod, 2010). Despite its disadvantages, this research approach can provide information that may not be accessible by other methods and has the ability to address aspects of a phenomenon that a scientific and quantitative approach is unable to explore (Maroun, 2012).

3.3 Research Design

3.3.1 Description of data sources and Research Material

The Department of Environmental Affairs (DEA) with its role of being the national leader in environmental management had to be the main organization of reference for this study. The DEA has the responsibility of "protecting, conserving and improving the South African environment and natural resources" (DEA website, 2019). As stipulated on its website their role is to ensure the citizens' rights to a clean environment are not violated. The DEA has

amongst their strategic objectives the mandate of providing environmental education and to regulate the licensing requirements, as well as managing biodiversity, conservation and heritage issues (DEA website, 2019).

According to the DEA website (2019, p. 1), *"DEA has nine branches which are Climate Change, Air Quality and Sustainable Development, Biodiversity and Conservation, Chemicals and Waste Management, Environmental Advisory Services, Environmental Programmes, Legal Authorisations and Compliance Inspectorate, Oceans and Coasts, Chief Operating Officer and Financial services*" (DEA website, 2019). To fulfil this study' objectives, data was collected from the Legal Authorisations and Compliance Inspectorate branch as stipulated on their website is responsible for providing legal services that allow DEA to protect and conserve the environment. The DEA is also responsible to promote and enforce compliance with the environmental legislation which amongst others include the National Environmental Management Act (NEMA), Act No. 107 of 1998. Based on their mandate, the Department of Environmental Affairs had to be selected to provide information regarding the environmental incident reporting protocol of South Africa.

The DEA has nine provincial offices which are the, Department of Agriculture, Environmental Affairs and Rural Development(KZN); Department of Economic Development, Environment & Tourism(Limpopo); Department of Economic Development, Environment and Tourism(Mpumalanga); Department of Environmental Affairs and Nature Conservation (Northern Cape); Department of Economic Development, Environment, Conservation and Tourism (North West); Department of Economic Development and Environmental Affairs (Eastern Cape); Department of Environmental Affairs and Development Planning (Western Cape) ; Gauteng Department of Agriculture and Rural Development (Gauteng); and Department of Economic Development, Tourism and Environmental Affairs (Free State Province). These provincial offices exist to fulfil the same mandate in their different provinces and report to the Department of Environmental of Affairs for centralization. For purposes of this study, data were collected from the national office and the four provincial departments in Gauteng, Gauteng, North West, KZN, and the Western Cape provinces.

Research materials were also collected from these study departments which included copies of the National Environmental Compliance and Enforcement Reports (NECER) from the year 2014 to 2017 and the draft guideline for the administration of emergency incidents and formed part of the content that was analyzed in an attempt to answer this study research questions. In addition to the material collected, interviews were also carried out with the Environmental Management Inspectors (EMIs) from these departments. EMIs are environmental

enforcement officials responsible for ensuring that the environmental legislation is followed and enforced. EMIs have powers to investigate any environmental-related cases, inspect any premises, and enforce compliance and issue compliance notices and admission of guilt fines (DEA website, 2019).

To complement the data collected from the Department of Environmental affairs, individuals involved in incident reporting were also contacted. These individuals were reached through the Survey Monkey online portal, where a survey link was created and shared with them through the South African Council for Project and Construction Management Professions (SACPCMP) distribution portal. This is a statutory body that registers and maintains a national register of Built Environment management professionals. These professionals are in many cases the same people responsible for environmental incident reporting in different organizations, hence this distribution portal was used to get views on their experiences in environmental incident reporting and for input on how effective environmental incident reporting can be promoted in South Africa.

3.3.2 Study Population and sampling procedure

The first research participants from each department were selected through purposive sampling, where their role as the Senior Environmental Management Inspectors (EMIs) made them the most appropriate respondents for selection. These respondents were contacted through a telephone to get their email addresses. Emails were then sent with the participant information sheets detailing the aim of the study and soliciting permission to conduct the study. At the Department of Environmental Affairs, the Senior EMI upon receiving the email advised that the request needed to be sent to the Deputy Director General (DDG) for the Legal, Authorisation, Compliance and Enforcement branch. An email was sent to the DDG who forwarded the request to the Chief Operating Officer. Permission was granted to engage the Environmental Management Inspectors on the study by the Chief Operating Officer. In the four provincial offices, the EMIs engaged with the relevant Human Resources departments and the authorization to carry out the study was given. The Senior EMIs took part in the interviews and referred their colleagues to also participate. A snowball or chain referral sampling technique was used in this instance. A total of 15 participants were interviewed in this study from the Department of Environmental Affairs national office and the departments in four provinces as mentioned in Section 3.2.1.

To complement the interviews, a request was also sent through the SACPCMP distribution portal to a selected sample of approximately 680 members. Responses received totalled to

115 thereby achieving a 17 percent response rate as indicated in Table 2. This response percentage was acceptable compared to that of other studies in the same research field for instance in a research by De Villiers and Vorster (1995) a 7.3 percent and that of Widener (2007) where a 12.5 percent response percentage was achieved.

Table 1: Questionnaire Percentage Response

Item	Number of People
Number of people distributed to	680
Number of Respondents	115
Response rate (%)	17

Source: Survey results (2018)

The non-probability, judgmental procedure for sampling was adopted in the selection of the Environmental Management Inspectors from the Department of Environmental Affairs. According to Saunders, Lewis, and Thornhill (2012), in this sampling technique, the researcher uses their own judgment to choose research participants. "*Purposive sampling selects respondents with a specific purpose in mind"* (Neuman, 2000, p. 198). Unlike in probability sampling where every member of the population has a high probability of being selected, no representative sample is selected in non-probability sampling (Neuman, 2000). Maxfield and Babbie (2014) state that non-probability sampling is more advantageous because it is less expensive and quick to be implemented than probability sampling. In this study, the researcher got to choose the sample guided by who they thought would be appropriate. Maxfield and Babbie (2014) further state that purposive sampling may present a disadvantage of subjectivity, but it is mostly considered the best in selecting small samples in one area or where the selection is limited to a certain population.

The snowball or chain referral sampling technique was used to identify additional research respondents, where the first Environmental Management Inspectors interviewed referred their colleagues to also participate in the study. This is a non-probability sampling method that allows the initial study participants to select or refer the researcher to other additional respondents (Dudovskiy, 2018). This technique is criticized for having a tricky ethical path to navigate and the impossibility of determining the sampling error however it suited this study best due to its ability to recruit hidden populations and its cost and time effectiveness.

3.3.3 Data Collection Tools

Interviews and questionnaires were employed as data collection tools for this study. As noted by Dornyei (2007) qualitative data is often collected through the use of interviews and questionnaires. The section below indicates how these data collection tools were employed to achieve to meet the study objectives.

a) Interviews

From the possible different qualitative research methods such as focus group interviews, unstructured interviews, semi-structured interviews and standardized open-ended interviews outlined by (Turner III, 2010), unstructured face to face and telephonic interviews, suited the aim of the study best, which sort to evaluate the efficiency of the environmental incident reporting protocol of South Africa. Unstructured interviews are described by Owens (1991) as a wholly open-ended instrument where interviewers compile a set of questions in a way that gives respondents the freedom to phrase and answer them the way they want. With interviewing flexibility for adapting questions as responses come is guaranteed and questions or answers can be clarified or probed more deeply as may be necessary (Cohen, Manion and Morrison, 2000).

According to Berg (2007), interviewing is very useful because it captures rich views of interviewees and enables them to share even more than what has been asked by the researcher. Though interviews have been criticized for requiring a lot of resources in comparison to other data collection methods, its data can be much richer and informative (Cohen, Manion and Morrison, 2000). For a study of this nature, interviews proved to be very appropriate, as a depth of useful information regarding environmental incident reporting was acquired through the interviewing process.

Interviews were conducted with 15 participants from the Department of Environmental Affairs and in its departments in four provinces as mentioned in Section 3.3.2 of this study. The language used to conduct the interviews was English and the notes were transcribed on a notebook in order to process them for the subsequent analysis. The interviewees were promised anonymity hence no voice recording was done. The interviews for the DEA and GDARD which are the departments in the Gauteng province, where the researcher resides took place at the interviewees' offices and the ones from different provinces were conducted telephonically. Each face to face interview took between 90 and 120 minutes and telephonic interviews took between 45 and 60 minutes. The interview schedule used for this study had two sections, with the first part soliciting the interviewees' background information and the second part consisting of questions requiring interviewees to share their experience in environmental incident reporting in their role as Environmental Management Inspectors.

b) Questionnaires

To complement the interviews, a questionnaire was also used in this study. McLeod (2018, p. 1) states that "*A questionnaire is a research instrument consisting of a series of questions for the purpose of gathering information from respondents. Questionnaires can be thought of as a kind of written interview that can be carried out face to face, by telephone, or online. The use of questionnaires in a study provides a somewhat cheap, quick and efficient way of obtaining large amounts of information from a huge sample of people and can cover a large geographic location"*. Data can be collected very quickly in the absence of the researcher which makes questionnaires very useful for use in large populations where interviews are not practical (McLeod, 2018). According to McLeod (2018), questionnaires can have both open-ended and closed questions which makes them wealthy of both quantitative and qualitative data.

An online survey tool, SurveyMonkey was employed in this study where a web-based questionnaire was created and distributed to various respondents through the communication secretary of the South African Council for Project and Construction Management Professions (SACPCMP), a professional board that maintains a register for Health and Safety Officers which are the most appropriate people involved with environmental incident reporting in various organizations. The questionnaire consisted of a mix of both open-ended and multiple-choice questions. The questions started from general and progressed to more specific questions informed by the research objectives. The questionnaire focused on the respondents' perception on the existing environmental incident reporting protocol, their experiences on how cases of environmental incidents are managed, and barriers in incident reporting and solicited suggestions on how effective environmental incident reporting could be promoted in South Africa. The survey was designed to be short with and had an average execution time of 4 minutes.

Axinn & Pearce (2006) suggest that open-ended questionnaires are flexible and allow respondents to freely raise other related issues that may not have been initially part of the survey. Questionnaires have been consistently used in South African Ph.D. studies on environmental reporting (De Villiers, 1996) and major international studies on environmental and corporate social reporting have also exclusively used questionnaires (Deegan & Rankin 1997; Gray, Owen & Adams 1996). Despite their limitations, such as low return and respondent bias, questionnaires allow for larger samples, provide easier access and are easier to administer, than other research methods (Durrheim & Terreblanch 2000).

3.3.4 Data Analysis

In all data analysis, regardless of its nature, the purpose of analysis as suggested by Polit & Beck (2006), is to organize and elicit meaning from the data collected and draw realistic conclusions. The researcher decided to adopt the content analysis technique to draw realistic conclusions, as it best suited the interpretivist/constructivist nature of the study. Content analysis is described by Bundy, Pfarrer, Short, and Coombs (2017) as a research technique that can be used to make inferences that can be reproduced by interpreting and grouping textual material into related themes. It is an approach that aims at analyzing communication material in a systematic way (Mayring, 2007). According to Eastwood, O'Connell & Considine (2011), content analysis is flexible for use on written texts and there are no specific rules that must be followed for example, deep interviews, focus group interviews, one single written question, questionnaire open-ended questions, observations or pictures (Eastwood, O'Connell & Considine, 2011) This method is common in social science research, hence the decision to adopt it for this study.

Content analysis can be done through grouping data into related themes, which is the method the researcher used for analysing the text data as suggested by Cohen *et al.* (2007) and proceeded to categorize the findings into four main sections that the interview was constructed upon, i.e. environmental incident reporting in South Africa, institutional set up for environmental reporting, barriers that exist in environmental reporting and proposed improvement measures. Creswell (2005 p. 236) suggests that *"content analysis categorizes, synthesizes and interprets qualitative text data by describing"*. When data was collected Hsieh & Shannon (2005)' suggestion was followed where data was read for many times and sub-groups and headings were created. The data was then described and narrated to provide synergy and meaning and the data that could be quantified was analysed by the use of Microsoft Excel where tables and graphs were generated.

Content analysis presents a number of challenges which include being extremely time consuming, subjectivity to increased error, being inherently reductive, difficulty to automate or computerize the results and inconsistency in themes, however it remains the common method of analysis in social sciences as it offers a flexible way of analysing text data and provides insight into complex models (Elo *et al*., 2014). Content analysis has proved very useful in summarizing key traits from huge data and helps the researcher to have an organized way of handling and analysing the data collected (King, 2004). Content analysis is also easy and quick to learn, as it has minimal rules and procedures (Braun *et al.,* 2019; King, 2004).

3.4 Methodological Reflections

The researcher entered the fieldwork with a detailed plan of how the study would be conducted however as the study progressed various significant challenges emerged. One challenge encountered included a lack of cooperation from the identified study organizations. The initial data collection plan included interviewing the Environmental Management Inspectors and the collection of incident reports for analysis from the Department of Environmental Affairs and its nine provincial offices. This could not happen as five of the provincial offices were not willing to take part in the study. Only the national office and four provincial offices agreed to take part in the study on condition that, only the information that was available to be public was used and the different companies' incident reports could not be shared with the researcher for analysis. The researcher was granted permission only to interview the Environmental Management Inspectors and fortunately the interviews were a success as the respondents shared in-depth insights regarding their experiences in environmental incident reporting which added great value to the study.

Another challenge was limited literature on the study topic. Prior research specific to environmental incident reporting was very limited, hence the researcher had to resort to looking into environmental reporting as a whole. The environmental reporting literature available mostly focused on reporting in annual reports by Stock Exchange listed companies and environmental reporting by private and unlisted companies has not received much attention. Further research can centre on environmental incident reporting by private companies and specific industry sectors i.e. construction, manufacturing, energy generation, and transport. To understand the environmental incident reporting process of South Africa and ascertain its efficiency, case studies of how specific incidents have been managed in the past can give more insight into the topic.

The researcher also intended to conduct interviews with private environmental consulting firms involved in environmental incident reporting in South Africa. To reach them, the researcher needed time and finance to find them using a search engine and contact them individually through telephone to get contacts of people directly involved in environmental incident reporting and request permissions to conduct the study, however, the time and budget did not allow for this to be achieved. Further research can focus on collecting environmental incident reporting information from private environmental consulting firms and environmental rights organizations involved in environmental justice and protection like, The Centre of Environmental Rights, Groundwork, Earthlife, and the Environmental Law Association.

The researcher also intended on conducting face to face interviews, however, the time and the budget did not all the researcher to travel to all selected provincial offices to collect data and resorted to conducting telephonic interviews. Though telephonic interviews can be time saving and cost effective they present a number of challenges like network disruptions, external factors where someone can walk in and disrupt the call and missing out on observing the behaviour and body language. For future research, the researcher can rather use face to face interviews than telephonic interviews, as face to face interviews generate more in-depth data and meaningful discussions where the interviewer can probe for explanations of responses.

A questionnaire was also circulated through a web link created on the Survey Monkey portal to members of the South African Council for Project and Construction Management Professions (SACPCMP), a body that keeps a register of health and safety practitioners which from the researcher's experience are the people involved in environmental incident reporting for various companies. This register is mainly for the construction sector which therefore affects the transferability of the research as the view of other sectors like manufacturing, transportation, energy, and many others were not solicited by the researcher. Future research can centre on selecting a study sample that can represent all sectors. The online survey tool used also yielded a low return rate of 17 percent, and despite the low return, the objectives were achieved.

The validity and reliability of the study were not measured in this study due to the constructivist nature of the study, however, trustworthiness was ensured. Four criteria as outlined by Shenton (2004) were addressed in an attempt to establish trustworthiness, which is, credibility, dependability, transferability, and confirmability. Firstly, according to Tobin & Begley (2004), credibility addresses the fit between respondents' views and the researcher's representation of them. Credibility was enhanced through ensuring that only highly knowledgeable interviewees directly involved with environmental incident reporting are purposively sampled from the organizations that are custodians of the environmental incident reporting protocol of South Africa to participate in the study.

Secondly, Tobin & Begley (2004) suggest that research dependability can be achieved by ensuring the research process is logical, traceable, and clearly documented. Therefore, the dependability of the current study was enhanced by ensuring that the research process is clearly defined in the methodology section for readers to understand how the research was carried out. The participants were asked similar semi-structured questions and the research

was also scrutinized by peers and the researcher's supervisor to help eliminate errors and enhance credibility.

Thirdly, transferability refers to the “generalizability’’ of the research and in qualitative research, it refers to whether the study can be generalized to another similar case (Tobin & Begley, 2004). Transferability in the current study was ensured through the purposive sampling of respondents and circulating questionnaires to a large sample size of about 680 people involved in environmental incident reporting in their various organizations. Finally, to ensure confirmability, the research should not consist of any personal bias and the researcher should act with good faith and clearly demonstrate that personal values are excluded since such values can affect the outcome of the research (Bryman & Bell, 2011). Therefore, confirmability, in the current study was enhanced through clearly identifying all data sources, systematic data analysis by use of themes and sub-themes and ensuring that all findings are correctly interpreted and linked to the existing literature.

CHAPTER FOUR

EMPIRICAL EVIDENCE

4.1 Introduction

This chapter is presenting the findings of the current study in relation to the research questions. The chapter is divided into five sections. The first section outlines the participants' views on environmental incident reporting in South Africa. The second section assesses the institutional framework within which effective environmental incident reporting can be pursued in South Africa. The third section highlights the current challenges and barriers that hinder effective environmental incident reporting in South Africa. The section thereafter presents the process by which reported environmental incidents get actioned and closed out by the relevant environmental authorities in South Africa. The chapter then concludes with the suggestions for improvement on the environmental incident reporting protocol of South Africa as outlined by the respondents.

4.2 Participants' perceptions of Environmental incident reporting in South Africa

One of the matters that the research needed to address was to determine whether the Environmental Management Inspectors (EMIs) and Environmental Officers (EOs) who were surveyed in this study were familiar with the current environmental incident reporting protocol of South Africa. In view of this, a question was asked which required them to state whether they were aware of this protocol. The responses are captured in Table 2. It is suggested in Table 2 that 60% of the research participants were familiar with the environmental incident reporting protocol while 40% were not.

Table 2: Knowledge of incident reporting by EMIs and EOs

Type of Response	Frequency	Percentage
Yes	78	60
No	52	40
Total	130	100

Source: Survey results (2018)

Having established that a significant percentage of people are familiar with the protocol it was important to determine how the knowledge came about, and another question was asked which required participants to state how they got to know about the environmental incident reporting protocol. The responses are captured in Table 3. It is suggested in Table 3 that a

higher percentage (81%) of research participants got to know about the protocol through the mass media.

Table 3: Sources of knowledge about the environmental incident reporting protocol

Type of Response	Frequency	Percentage
Mass Media	63	81
Workshops held by the DEA	15	19
Total	**78**	**100**

Source: Survey results (2018)

Based on the response from the first question it was also important to establish whether the environmental incident reporting protocol was adequate or any improvement was required. In view of this, a question was asked which required the research participants to state whether the environmental incident protocol was adequate or not. The responses are captured in Table 4. It is suggested in Table 4 that a higher percentage of research participants are of the view that improvement is required on the current environmental incident reporting protocol of South Africa.

Table 4: Participant's views on the current environmental incident reporting protocol

Type of Response	Frequency	Percentage
Improvement Required	54	47
Not sure	33	29
Adequate	28	24
Total	**115**	**100**

Source: Survey results (2018)

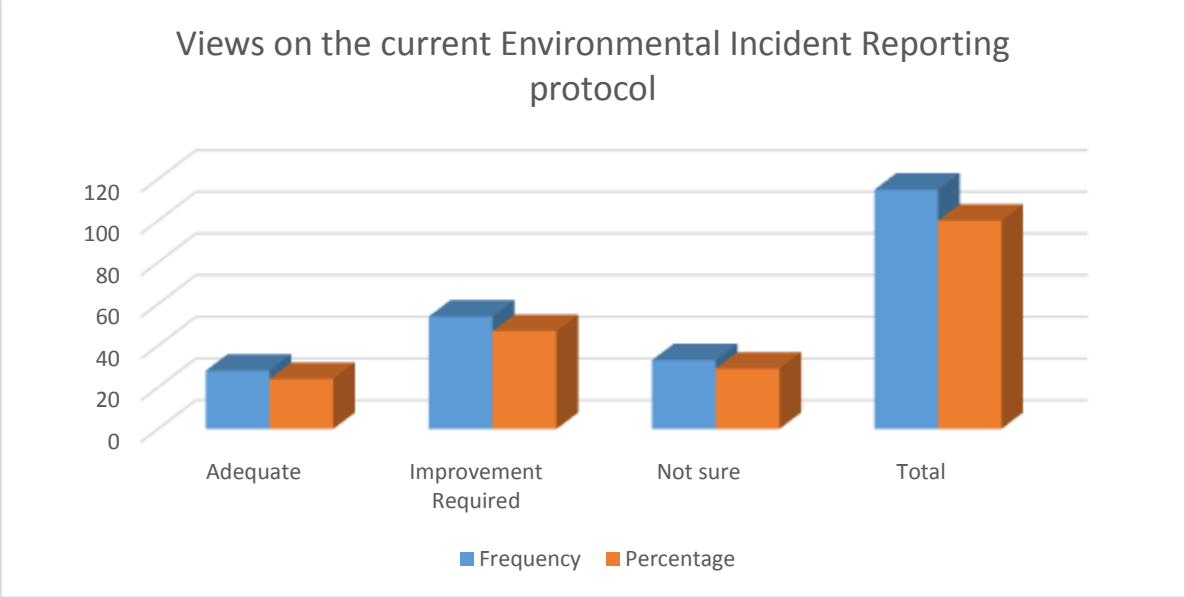

Figure 1: The respondents' views on the current environmental incident reporting protocol

Having established the respondents' views on the current incident reporting protocol of South Africa, it was also critical to get the EMIs to share their experiences in Environmental incident reporting in their various departments. A question was asked, "What has your experience in environmental incident reporting been?" In response to this question, one participant from GDARD stated the following:

> *"My experience in administering Section 30 of the NEMA has been accompanied by lack of clarity on a number of aspects which include, contradiction of the Section 30 requirements with the other legislation (i.e. the Air Quality Act on reporting timeframes) and lack of clear guidelines on how the process should be implemented"* Pers.com (2018a).

Another participant from the DEA stated that:

> "*We have encountered a number of challenges in environmental incident reporting due to lack of clear guidelines, an attempt has been made by the department to develop the guidelines however the process of finalizing them is taking too long"* Pers.com (2018b).

On a similar note, another participant from the same organization stated that:

> "*Though the guidelines that are currently being developed may be finalized, the challenge we will remain with is that the guidelines are not law, amendments are required on the environmental incident reporting legislation itself, as guidelines are not enforceable*". Pers.com (2018c).

Two participants from the Western Cape Department of Environmental Affairs and Development Planning shared similar sentiments to those of their counterparts from other provinces by indicating that the current reporting has a lot of gaps that make its implementation difficult. For instance, the definition of a hazardous substance. There are cases where EMIs had to deal with cases of milk spillages into water sources, where a large spillage would trigger an incident but the definition in the requirements does not cater for such. In relation to the above, a participant from the Eastern Cape provincial department had also an almost similar incident of tomato paste spillages on the river where in the environmental incident reporting requirements the substance could not be deemed as hazardous though it could pose adverse effects on the environment when discharged in large quantities. The other concern raised by both these provincial departments was the issue of thresholds stipulated on the NEMA, indicating that the thresholds for environmental incident reporting are confusing and difficult to measure on the ground.

The participants from the KwaZulu Natal provincial department echoed the same sentiments regarding the definitions and thresholds indicating that they had experienced challenges in dealing with cases involving spillages of cooking oil and Vaseline on to the water as they are not deemed as hazardous substances in the legislation. The other issue of concern from the KwaZulu Natal provincial department was lack of clarity on the responsibility of different authorities (i.e. Department of Water Affairs, Municipalities, National Department of Environmental Affairs and provincial offices). The participants indicated that this lack of clarity on responsibilities and jurisdiction is confusing and may contribute to inefficiency in environmental incident reporting.

4.3 The institutional framework within which effective environmental incident reporting can be pursued in South Africa

After exploring the respondents' views on the incident reporting protocol of South Africa it was important to examine the institutional framework within which effective environmental incident reporting can be pursued in South Africa. In attempting to understand the setup, the National Environmental Compliance and Enforcement Reports (NECER) for a period of four years from 2013 to 2017 were collected from the DEA for review. These reports outline the Department of Environmental Affairs and its nine provincial offices' setup in terms of environmental incident management, including the number of human resources dedicated to environmental incident reporting and the reporting percentages per sector.

The review findings are captured in Table 5 and 6. In Table 5 and Figure 2, an increase in the number of EMIs for both the National and provincial Departments of Environmental Affairs from the period 2013 to 2017 is suggested.

Table 5: Number of Environmental Management Inspectors per Department

Year:	2013/2014	2014/2015	2015/2016	2016/2017
DEA	65	63	83	135
GDARD	64	49	49	50
KZN DEDTEA	38	32	34	68
WESTERN CAPE DEADP	66	72	77	66
NORTHWEST DEDECT	32	45	46	46
ESTERN CAPE DEDECT	48	52	50	44
FREE STATE DEDTEA	30	42	41	40
LIMPOPO DEDET	237	255	269	256
MPUMALANGA DEDET	13	14	11	9
Total	**593**	**624**	**660**	**714**

Source: National Environmental Compliance & Enforcement Reports (2013-2017)

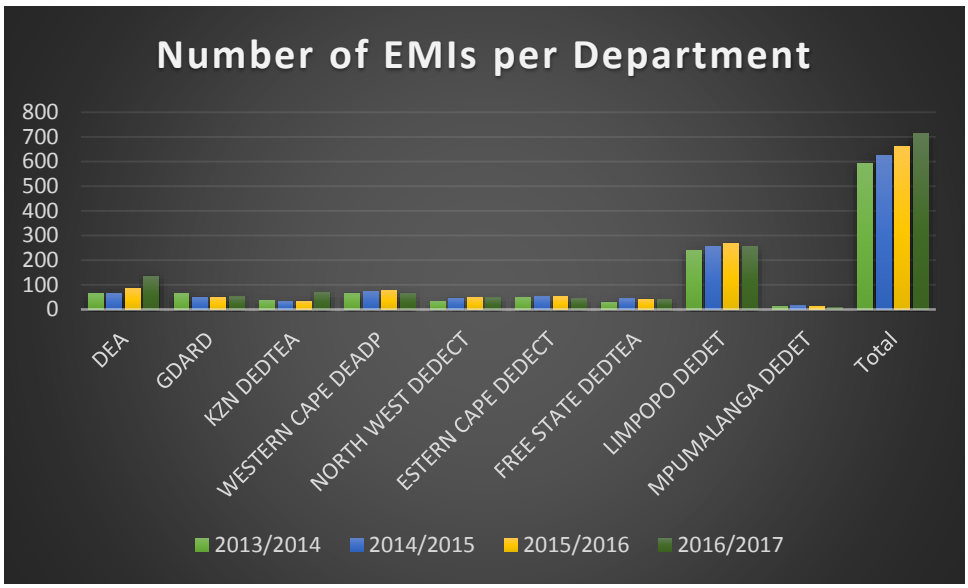

Figure 2: Number of Environmental Management Inspectors (EMIs) per institution

In an interview, the EMIs were also asked about their staff compliment where they indicated that they were between 3 to 5 EMIs in Enforcement and Compliance per department. One research participant from DEA stated that:

> *"The department is currently short staffed; if we are to get more EMIs allocated to the department our work will be much easier'* Pers.com (2018h).

The EMIs also indicated that most EMIs are based in Municipalities and other governmental institutions.

In exploring the institutional framework within which effective environmental incident reporting can be pursued in South Africa, it was also critical to evaluate various sectors and their environmental incident reporting trends to establish their participation in the process.

It is suggested in Table 6 and Figure 3 that not all sectors report on environmental incidents to the relevant authorities. The Power generation sector on average is the leading reporting sector.

Table 6: Reporting percentages per sector

Year:	2013/2014	2014/2015	2015/2016	2016/2017
Transport	31	4	-	18
Rail transport	-	27	14	17
Petroleum	24	9	-	-
Refinery	7	1	25	-
Mining	2	-	-	-
Power generation	13	48	43	45
Food production	2	-	-	-
Consulting	-	-	-	-
Waste	6	2	-	-
Government	3	-	-	-
Other	2	6	18	17
Automotives	-	-	-	-
Cement	-	-	-	-
Wood	-	-	-	-
Ferrometal	2	2	-	-
Chemical	5	-	-	-
Pulp and Paper	1	4	-	-
Pipeline	-	1	-	-
Total	**100%**	**100%**	**100%**	**100%**

Source: National Environmental Compliance & Enforcement Reports (2013-2017)

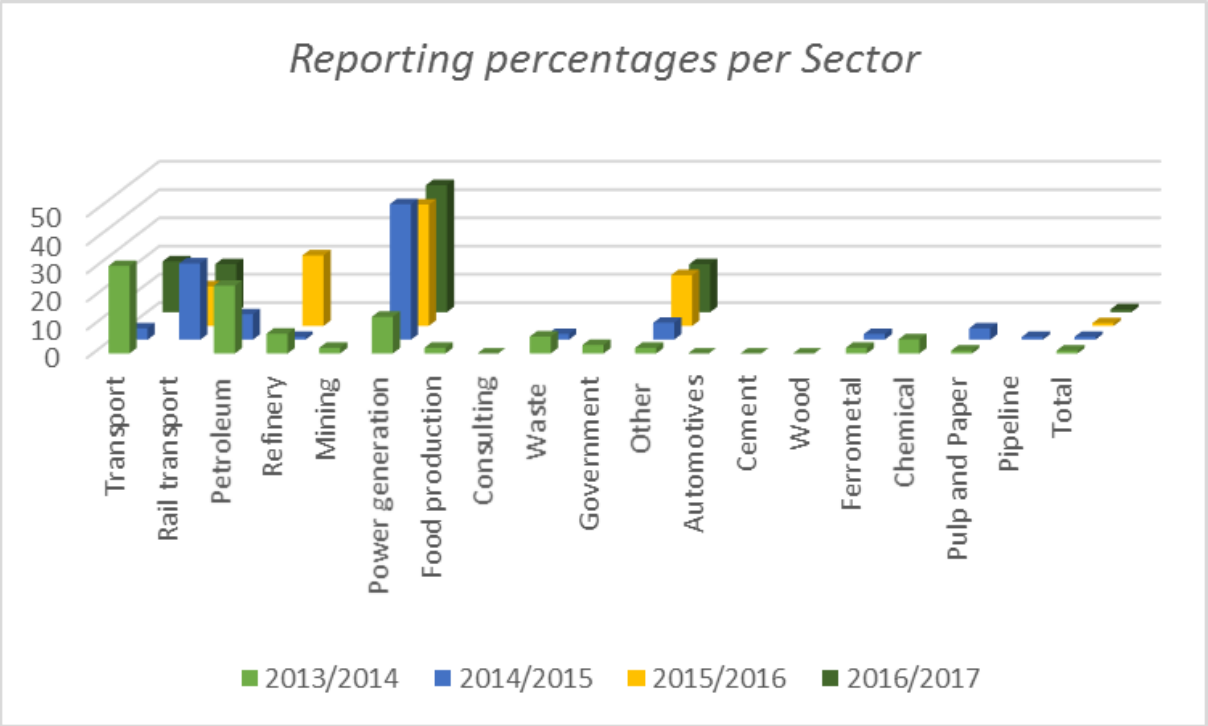

Figure 3: Reporting percentages per Sector [Source: NECER (2013-2017)]

The environmental incident reporting trends were further assessed by the use of interviews, where the interview participants were asked which sectors commonly reported on environmental incidents. In response, the research participants alluded that, the road transport sector reported the most compared to all other industries. They also indicated that most of the reports received were mainly from parastatals and big corporate companies compared to small industries. The research participants were also entreated to share their experiences on how incident reporting is received by industries. In response to this question, all respondents insinuated that most industries are not keen to report on environmental incidents due to various reasons like fear of clean-up costs and lack of knowledge on the reporting requirements.

4.4 Challenges and barriers that hinder effective environmental incident reporting

After exploring the environmental incident reporting protocol of South Africa and the institutional framework within which effective environmental incident reporting can be pursued in South Africa, it was important to investigate the barriers and challenges that hinder effective environmental incident reporting. The followed question was asked, “In your opinion what barriers and/or challenges do you think to exist in the environmental incident reporting process’’. In response to the question, one participant from GDARD stated that:

"Lack of clear guidelines, lack of knowledge and fear of clean-up costs by industries hinders environmental incident reporting" Pers.com (2018a).

Another participant from the DEA stated that:

"We currently have a challenge with human resources, in many cases, we are unable to go out to either inspect premises or educate industries on environmental incident reporting" Pers.com (2018b).

The interviewees from the Western Cape Provincial Department echoed similar sentiments and in addition, one research participant stated that:

"Only if there were adequate coordination and communication between the National and Provincial offices as well as municipalities, environmental incident reporting was going to be a smooth sailing process" Pers.com (2018d).

All other participants from the Eastern Cape and the KwaZulu Natal provincial offices echoed similar sentiments to those of their counterparts by citing lack of clear guidelines, lack of knowledge by industries, inadequate clarity on responsibilities and mandates of different authorities, and fear of accountability by industries as barriers that hinder effective incident reporting in South Africa.

The same question was also asked in a survey and the responses are captured in Table 7 and Figure 4 below. It is suggested in Table 7 that lack of knowledge in environmental incident reporting is the leading barrier that hinders environmental incident reporting in South Africa, followed by a lack of clear guidelines and policies to guide the process.

Table 7: Barriers in the environmental incident reporting

Barriers in Environmental Incident Reporting	Number of Reponses	Percentage
Lack of knowledge of environmental legislation and reporting procedures	22	19
Lack of clear guidelines and robust policies to guide the process	18	16
The stigma attached to criminal/civil liability and fear of reputational damage	14	12
Lack of urgency by authorities in responding to reported incidents	13	11
Deliberate dishonesty by industries for fear of clean-up costs	11	10
Inadequate EMIs appointed in relevant institutions	11	10

Incompetent authorities	9	8
Not enough policing or prosecution of transgressors by authorities	8	7
Corruption and monopoly by big polluters	5	4
Lack of political will and funding	2	2
Lack of incentives	2	2
Total	**115**	**100**

Source: Survey results (2018)

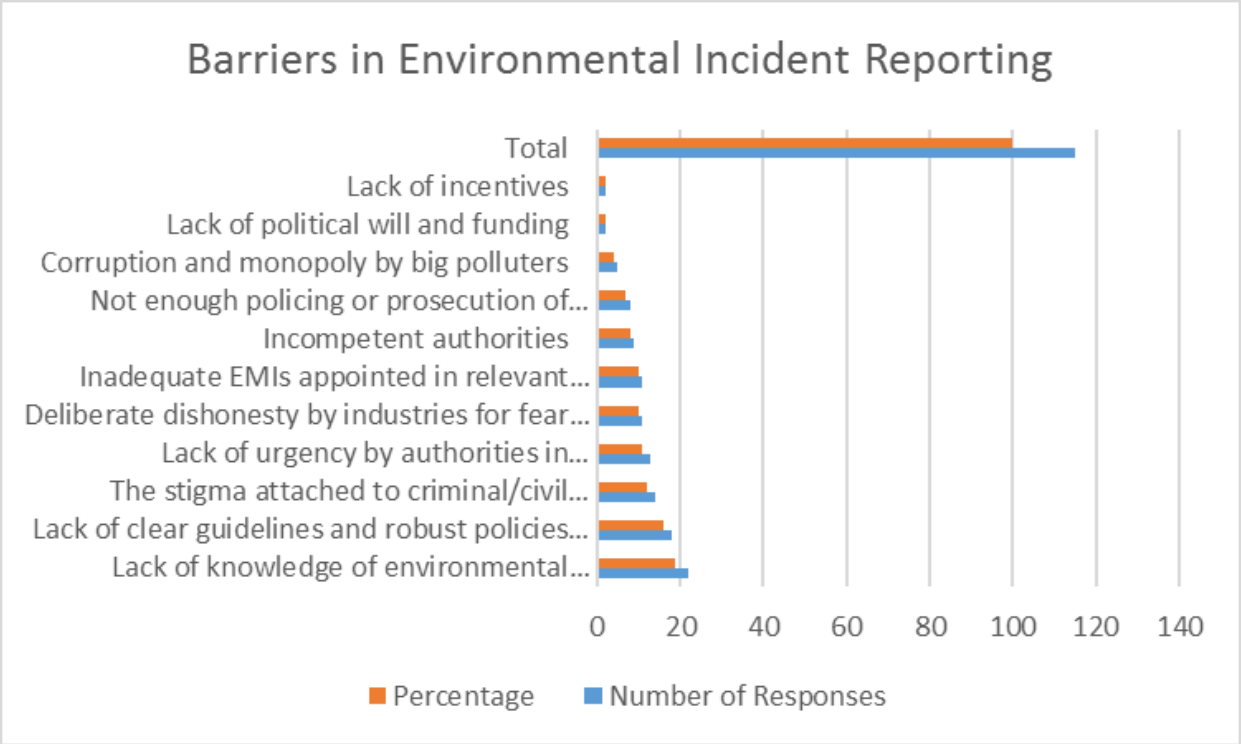

Figure 4: Barriers in environmental incident reporting

4.5 The process by which reported environmental incidents get actioned and closed out by the relevant environmental authorities in South Africa

Another key issue that needed to be tackled in this study was to understand the process by which reported environmental incidents get actioned and closed out by the relevant environmental authorities in South Africa. It was important to examine how the process is implemented and the availability of tools that promote efficient implementation. To pursue this the interview respondents were asked if there were any standard reporting templates available and whether the reporting industries were familiar with them. In response to this question, all interviewees indicated that a standard reporting template was available. They also indicated that several reporting industries were however not aware of it, as most reports were usually

received in wrong formats and those submitted using the correct template on several occasions would be inadequately completed.

Having established that the reporting template was available, it was also important to establish how relevant authorities respond to the reported environmental incidents and whether the process of managing the reported incidents, from receipt of the initial report to actioning and closing out the case, was clear. A question was asked, “Is there a stipulated timeframe for investigating and closing out the reported environmental incident cases? If so, are all cases investigated and closed out within the set time frame?” In response to the question, the research participants indicated that the protocol did not stipulate the timeframes for investigating and closing out the reported environmental incident cases. One respondent from GDARD stated that:

> *“Reported cases are only closed out when the reporter submits a clean-up or rehabilitation report, which can sometimes take up to 2 years. The onus is on the reporter and no follow up is made by the department to ensure all cases reported are actioned and closed out as the legislation does not stipulate the timeframe by which a closeout should be done” Pers.com(2018a).*

Another research participant from the Eastern Cape provincial department indicated that:

> *“Follow up and closing out of incidents is determined by individual Environmental Management Inspectors depending on the severity of the incident” Pers.com (2018e).*

Related to the above, another research participant from the KwaZulu Natal provincial department suggested that:

> *“Follow up and closing out of incident cases is driven by media and public complaints where issues that are covered by the media get to be attended to more hastily than others” Pers.com(2018f).*

Another research participant from the Western Cape provincial department stated that:

> *“Reported incident cases are followed up and closed out within 30 days as stipulated in their provincial internal Standard Operating Procedures (SOPs)” Pers.com(2018g).*

Having established that the incident reporting protocol had no specific timeframes for actioning and closing out the reported environmental incidents, it was important to establish whether the research participants were satisfied with the way environmental incidents are investigated and dealt with by the responsible public environmental authorities. A question was asked, “Are you satisfied with the way environmental incidents are investigated and dealt with by the

responsible public environmental authorities?" The responses are captured in Table 8. It is suggested in table 8 that 51% was dissatisfied, 28% was not sure and 21% was satisfied.

Table 8: Satisfaction with how incidents were dealt with by public authorities

Type of Response	Frequency	Percentage
Dissatisfied	59	51
Not sure	32	28
Satisfied	24	21
Total	**115**	**100**

Source: Survey results (2018)

In a follow-up question soliciting the reasons for dissatisfaction with the way environmental incidents are dealt with by public authorities. The responses are captured in Table 9. It is suggested in Table 9, that a lack of competent caseworkers (53%) is the leading reason for dissatisfaction in the way reported incidents are dealt with by public authorities.

Table 9: Reasons for dissatisfaction with how incidents were dealt with by public authorities

Type of Response	Frequency	Percentage
Lack of competent caseworkers	31	53
No feedback is given after reporting	17	28
No convictions of perpetrators	11	19
Total	**59**	**100**

Source: Survey results (2018)

4.6 How the environmental incident reporting process can be improved

After considering the challenges, barriers, and shortcomings of the environmental incident reporting requirements, it was important to conclude the chapter by looking into the current initiatives by the departments to promote environmental incident reporting and also assess how the environmental incident reporting process can be improved. In looking at the current initiatives, the interviewees were asked the following question, "What initiatives, training or support, if any, does your organization offer to industries to promote effective environmental incident reporting?". The responses are captured in Table 10. It is suggested in Table 10 that only two departments had initiatives in place to promote environmental incident reporting while others had none.

Table 10: Initiatives to promote effective environmental reporting

Initiatives to promote effective environmental reporting	
Gauteng Provincial Department	One enforcement week a year is dedicated to raising environmental incident reporting awareness across industries.
National Department of Environmental Affairs	The last incident reporting awareness program was done in 2014, currently, no incident reporting initiatives are directly aimed at industries except for Environmental Management Inspector training done annually and attending the Road Incident Management Committee meetings when invited.
KZN Provincial Department	No incident reporting initiatives are done; however, they attend the N3 Toll concession meetings to raise awareness on incident reporting.
Western Cape Provincial Department	No incident reporting initiatives in place.
North West Provincial Department	Awareness campaigns are done quarterly, with the last done in February 2018.

Source: Survey results (2018)

A follow-up question was then asked the Gauteng and the North West provincial offices regarding the effectiveness of the initiatives. In response to the question, the departments indicated that there was a notable increase in cases reported after the awareness campaigns. The respondents further suggested that interventions can be improved through reaching out to industries, planning more awareness campaigns and competitions and reaching out to different sector forums (i.e. farmers' forums).

Having established the training initiatives, it was important to understand the EOs' views on what can be done to improve the environmental incident reporting protocol. A question was asked which required them to state any improvements required on the protocol. The responses are captured in Table 11 and Figure 5. It is suggested in Table 11 that 17% of the research participants stated that more training and advertising needs to be done to increase public awareness and EMIs should be capacitated to promote effective environmental reporting.

Table 11: Suggested Improvements

Improvement required	Number of Responses	Percentage
More training and advertising to be done to increase public awareness	20	17
Capacitate EMIs to be able to fulfil their functions	19	17
Reporting should be centralized and web-based	13	11
Additional caseworkers to be employed	16	14
Prioritize enforcement of the requirements	16	14
Provide clear and detailed guidelines	14	12
Allocate sufficient financial resources to the process	9	8
Introduce performance-based incentives	6	5
Environmental Control Officers should be employed by a legal body and placed in industries	2	2
Total	**115**	**100**

Source: Survey results (2018)

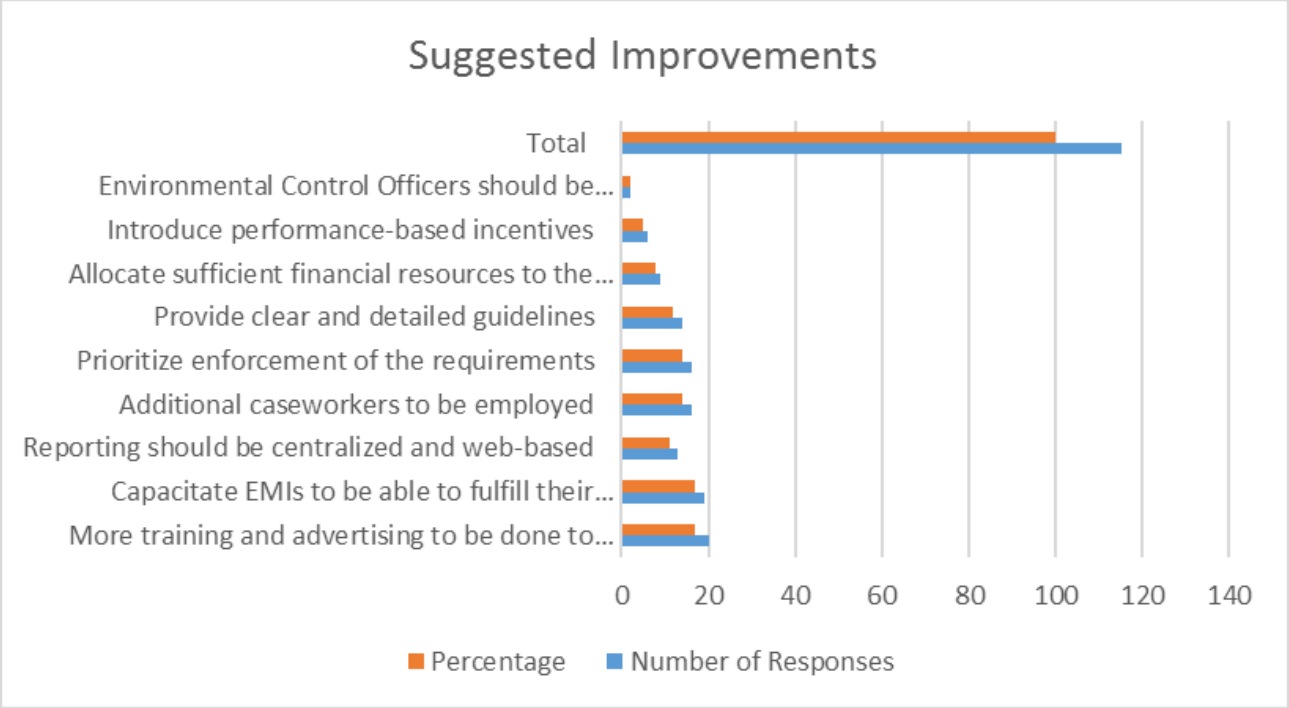

Figure 5: Improvement recommendations on the current environmental incident reporting process.

The EMIs were also asked the same question and their responses are captured in Table 12. It is suggested in Table 12 that improvement is required in the legislation, implementation process, training and language of communication of the environmental incident reporting protocol of South Africa.

Table 12: Improvement required in the current environmental incident reporting protocol

Legislation	Practice	Training and Communication
Inclusion of thresholds in Section 30 of NEMA.	The protocol should take into consideration different provincial landscapes when setting timeframes.	Availability in other languages like Afrikaans, Zulu, etc.
Clarity on the responsibilities of different authorities	Implementation of the provisions for clean up by the DEA where the polluter is unable to clean up or cannot be identified.	Reinforcement of Section 30 workshops to raise awareness among industries.
The definition of "incident" suggests that only hazardous substances should be reported and do not take into consideration different receptors.	Allocating a budget to responsible authorities for clean-up and easing the process of appointing service providers for cleaning up in case of incidents.	The different departments' engagement with municipalities should be promoted.
The legislation should be clear when it mentions the municipality as the relevant authority whether it means the district or local municipality.	Capacity building, through employing more EMIs.	
The incident reporting guidelines should be finalized and shared with industries.	Building the capacity of municipalities that are allocated the responsibility of being the first respondents.	

Source: Survey results (2018)

In summary, therefore, the findings suggest that most respondents were familiar with the environmental incident reporting protocol of South Africa and the familiarity came about through the media. It emerged that the current environmental incident reporting protocol lacks clarity on various aspects like definitions, thresholds, responsibilities of different government authorities and the guidelines to standardize implementation. It is also suggested that improvement is required on the protocol to address the current barriers and challenges which include inadequacy of human and financial resources and lack of training and awareness campaigns to promote efficient environmental incident reporting. The following chapter will go on to synthesize and discuss the above-presented findings with reference to the literature review chapter.

CHAPTER FIVE

DATA ANALYSIS AND DISCUSSIONS

5.1 Introduction

This chapter is dedicated to in-depth analysis and discussion of the key findings presented in Chapter 4 of the study. The aim of the research was to evaluate the efficiency of the environmental incident reporting protocol of South Africa through identifying challenges and avenues through which effective environmental incident reporting can be pursued. The chapter is outlined with reference to this aim and the four objectives of the study. The first section discusses environmental incident reporting and challenges in South Africa. The second section assesses the institutional framework within which effective environmental incident reporting can be pursued in South Africa. The third section evaluates the current barriers that hinder effective environmental incident reporting in South Africa and the final section discusses the findings on the process by which reported environmental incidents get actioned and closed out by the relevant environmental authorities in South Africa.

5.2 Environmental incident reporting and challenges in South Africa

The findings showed that most research participants were familiar with the incident reporting protocol of South Africa. Though the percentage of those unfamiliar with the protocol was lower than those familiar, a 20% difference indicates that more effort was still required to make environmental incident reporting popular in South Africa. Anderson, Wentzel, Romani, and Phillips (2010) evaluated the environmental consciousness in South Africa and concluded that environmental matters are not a high priority for the South African public. With reference to Anderson *et al.* (2010) findings and learning from the current study that 40% of the research participants are not familiar with the reporting protocol, it is evident that awareness training initiatives are required for the public to be informed on the environmental incident reporting protocol of South Africa.

It also emerged from the findings that most research participants got to know about environmental incident reporting through mass media. Mass media sources include radio and television broadcasting, publishing, advertising, and the internet. In this finding, the role of media in promoting environmental awareness is introduced. According to Anabela (2008), mass media is the main source of information about environmental issues in most countries. Related to this, these research findings reinforce that media plays an important role in disseminating environmental information. The findings are also consistent with Khan (2016) who asserts that an increase in media coverage, has contributed to making the society aware of the effects their activities to the health of the environment. For efficient environmental

incident reporting to be achieved, it is therefore imperative to involve the media in promoting both industries and public awareness. It was also revealed that the least percentage of the research participants got to know about the protocol through the DEA workshops. Given the fact that the DEA is the main organisation that carries the mandate of environmental education in South Africa, their deficiency in this regard is very concerning. Until such a time that the environmental custodians (DEA) will take the lead in promoting environmental awareness, efficient environmental incident reporting will remain a dream.

In evaluating the efficiency of the environmental incident reporting protocol of South Africa, a number of gaps that made its implementation difficult were identified which are, lack of clarity on the implementation process, inadequate definitions, and thresholds. Findings such as these clearly denote that improvement is required on the current environmental incident reporting protocol to address such challenges. Deegan (2017) states that no improvement has been noted on the quality of environmental reporting since its evolution, and the state of the environment has degraded furthermore. In this light, the lack of improvement could be attributed to the lack of clear guidelines on how the process should be implemented as evident in the current study findings.

Lack of clarity on the responsibilities of different government departments was another key finding. According to Fabricius, Matsiliza, and Sisitka (2003), many South African policies talk of inter-departmental cooperation, but none specify the institutional mechanisms to achieve it. "*The South African policies lack the 'how to do' guidelines and where the inter-departmental cooperation is mentioned, little thought is given to how this should work in practice*" (Fabricius, *et al.,* 2003, p. 5). In relation to this, Middleton, Goldblatt, Jakoet and Palmer (2011, p. 4) state that "*environmental governance is a complicated arena in South Africa, partly due to a fragmented and evolving legislative framework and a lack of clarity in the division of roles and responsibilities across the three spheres of government"*. The research participants indicated that the roles of the national, provincial and municipalities in terms of environmental incident reporting is not clear which affirms the assertions by Fabricius *et al.* (2003) and Middleton *et al.* (2011). If this lack of clarity in the environmental legislative framework persists, effective environmental reporting will remain a mystery.

5.3 The institutional framework within which effective environmental incident reporting can be pursued in South Africa.

The institutional framework within which effective environmental incident reporting can be pursued in South Africa was assessed in an attempt to understand the setup, human

resources allocation, and environmental incident reporting trends. The in-depth analysis of the National Environmental Compliance and Enforcement Reports (Table 6) in section 4.3 revealed an increase in the number of Environmental Management Inspectors for both the National and provincial offices of the Department of Environmental affairs from 593 in the year 2013 to 714 in 2017. In relation to this, it was also discovered from the EMIs' interviews that each department had between 3 to 5 EMIs dedicated to Enforcement and Compliance. If the National Environmental Compliance and Enforcement Reports were a true reflection of the number of EMIs in the country, the researcher sort to understand where the other EMIs referred to on the reports were operating from. When probed further, it was understood that the remainder was allocated to municipalities and other government institutions.

It is evident from findings that, the current EMIs allocation to the DEA and its provincial departments is inadequate and the current capacity is not able to expedite their responsibilities fully. The research findings indicated that other duties like conducting proactive ad-hoc inspections, awareness campaigns and following up and closing out all reported incident cases are neglected due to inadequate human resources. Capacitating the departments will ensure their responsibilities are fulfilled without lacking. Related to this finding, the Director-General in the DEA, 2015-2020 strategic plan acknowledged that the department is under-resourced and committed to increasing the human resources to improve compliance and enforcement (DEA, 2015).

The various sectors and their environmental incident reporting trends were also examined to establish their participation in the process. The findings (*see Table 7*) revealed that not all sectors report on environmental incidents to the relevant authorities. The Power generation sector on average was the leading reporting sector that reported consistently each year in the four years studied. Rail transport and road transport also followed the lead. Other sectors like the petroleum, refinery, waste, Ferro metal and pulp and paper reported at least twice during the reporting period under study, while the government, food production, mining, and chemical sectors reported once and no reports were received from the consulting, automotive, cement and wood sectors. It was noted that the big parastatals were mostly engaged in environmental incident reporting than small industries. These findings affirm Gueben and Skerratt (2007) assertions that small to medium enterprises (SMEs) only take part in environmental reporting when forced by external pressure to do so, for instance, the need to acquire some sort of mandatory environmental certification. Gueben and Skerratt (2007, p. 6) further stated that "*SMEs see no added value in environmental reporting, meaning that, unless the concept and image of environmental reporting changes or legislative pressures or demand from core stakeholders increase, most environmentally active SMEs are very unlikely to take up*

environmental reporting". This could be the reason why little or no reports were received from other sectors as presented in Table 6. Without clear external and legislative pressure, other sectors that are dominated by SMEs will continue with their reluctance in environmental incident reporting.

5.4 Barriers that hinder effective environmental incident reporting in South Africa

In this section, the findings on the barriers that hinder effective environmental incident reporting in South Africa are synthesized (*see Section 4.4).* The study revealed the following as barriers that hinder environmental incident reporting in South Africa:

I. Lack of knowledge;
II. Lack of clear guidelines;
III. Fear of accountability by industries
IV. Inadequate human resources;
V. Fear of clean-up costs by industries; and
VI. Inadequate clarity on responsibilities and mandates of different authorities.

An interesting dimension on the barriers that exist in the environmental incident reporting was also uncovered from the difference in views between research participants. The EOs brought to light some barriers that the EMIs would not mention which included, incompetency of authorities, lack of urgency in dealing with reported cases, corruption and monopoly by big polluters and lack of legislation enforcement by relevant authorities. Soliciting answers from external role-players proved to yield more results as the people directly involved in managing the environmental incident reporting process were hesitant to share information that would discredit them.

Boeger, Murray, and Villiers (2008) state that lack of a clear definition and clarity on the required contents or structure of environmental reports hinder effective environmental reporting. The current research findings affirm prior research findings by Boeger *et al.* (2008). In addition to this, Tixier (2003) also suggests that companies resist reporting for fear of resentment and suspicion of their motives. It is evident from findings that more effort is required to address the stigma attached to environmental incident reporting and as alluded in Section 5.2 clarity on definitions and the implementation process must be provided for efficient environmental incident reporting to be achieved.

In relation to the above, Solomon and Lewis (2002) also point out that companies do not participate in environmental reporting because of reluctance to report sensitive information and lack of a legal obligation. The current study findings also identified a lack of clear guidelines and fear of accountability by industries as barriers that hinder effective environmental incident reporting. Figure 9 below illustrates the effects of the lack of clear guidelines on incident reporting. It can be concluded that a lack of clear guidelines contributes to a lack of environmental incident reporting and an increased decline in the state of the environment. Therefore, for efficient environmental incident reporting to be achieved, clarity on reporting guidelines must be provided and all other barriers mentioned above should be addressed.

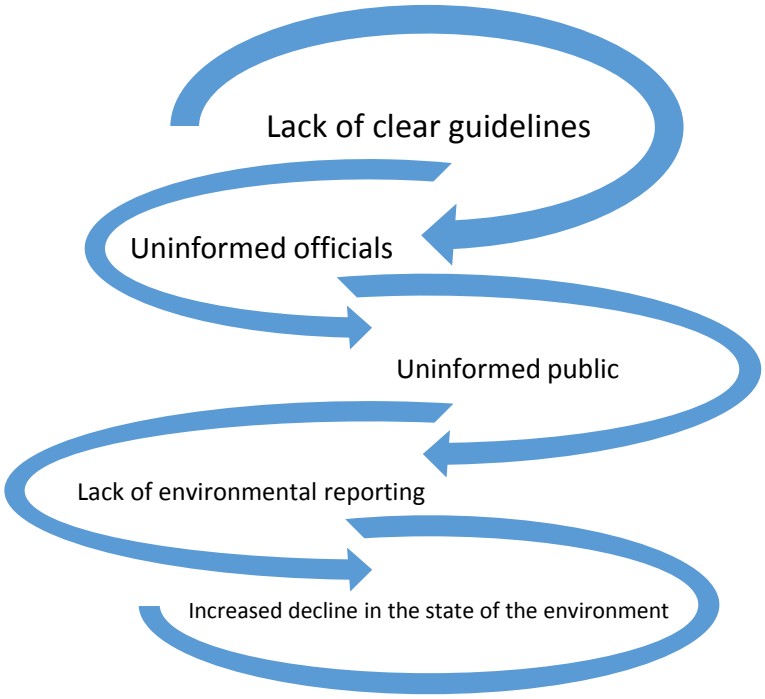

Figure 6: The effects of a lack of clear guidelines on incident reporting

Source: Based on fieldwork notes (2019)

5.5 The process by which reported environmental incidents get actioned and closed out by the relevant environmental authorities in South Africa

The process by which reported environmental incidents are actioned and closed out as outlined in section 4.5 is assessed in this section. The findings revealed that there are no clear guidelines on the timeframes for investigating and closing out the reported environmental incident cases, hence reported cases are dealt with differently from one department to another *(see section 4.5).* It is evident that the current incident reporting process lacks standardization. Standardization of processes contribute to a decrease in ambiguity and guesswork, guarantees quality and boosts productivity (Brandall, 2018). Therefore, in line with this

assertion, it can be presumed that standardization of the environmental incident reporting process can lead to efficient environmental incident reporting. Figure 7 illustrates how effective environmental incident reporting can be achieved through standardization.

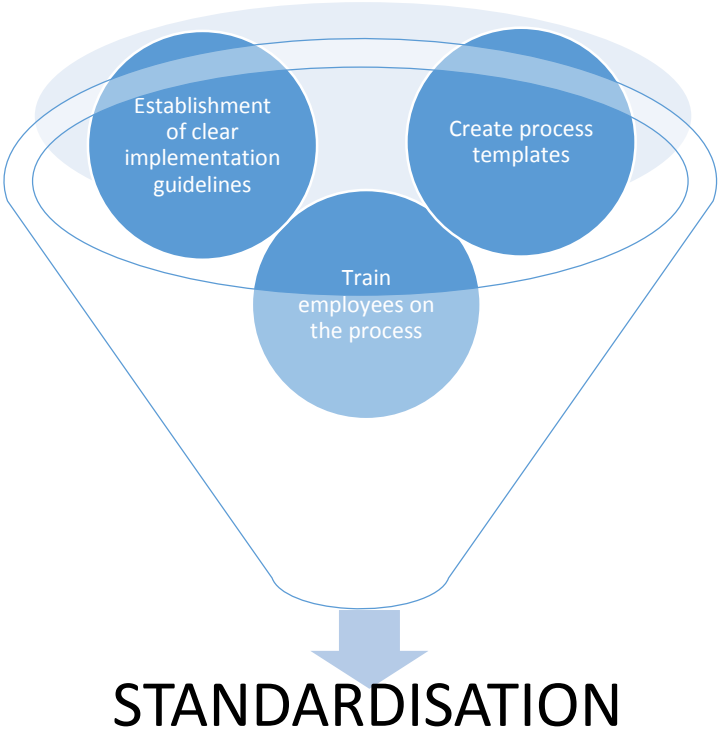

Figure 7: Standardisation process

Source: Based on fieldwork notes (2019)

It is also evident from findings that the process is not properly communicated to different role players. Environmental incident reporting information should be disseminated to the public and industries. Having legislation is not enough when the relevant stakeholders affected by those laws are not familiar with them. Sanelli (2018) states that having policies is good for any organization, however, they are rendered useless if they are not effectively communicated. It is in this light, that the importance of educating industries on the requirements of environmental incident reporting is accentuated.

The findings also revealed that a higher percentage of the research participants were dissatisfied with the way environmental incidents are investigated and dealt with by the responsible public environmental authorities with the leading reason for dissatisfaction being the lack of competent EMIs. Based on these results, Figure 10, illustrates how the incompetence of DEA officials contributes to inefficiency in environmental incident reporting.

Therefore, it can be concluded that, without adequate and competent EMIs, efficient incident reporting will remain a fantasy.



Figure 8: Contributing factors to inefficiency in environmental incident reporting

Source: Based on fieldwork notes (2019)

The research findings show clearly that there is inadequate clarity on various aspects in the current environmental incident reporting protocol, which includes definitions, thresholds and the roles or responsibilities of the three government spheres. The environmental incident reporting process is also not standardized across all responsible institutions. The researcher submits that, the lack of clarity and standardization on the incident reporting protocol impacts negatively on compliance and enforcement. The research findings also show that there is a lack of adequate EMIs to manage the implementation of the protocol and inadequate training and awareness are offered to the public and industries. This lack of adequate human resources and training contributes to inefficient environmental incident reporting. Industries and the public cannot be held accountable for not reporting environmental incidents when they are not made aware of the reporting process. It is only through addressing these challenges that effective environmental incident reporting can be achieved.

The next chapter is the conclusion of the research findings and further recommendations for the improvement of the efficiency of the current environmental incident reporting protocol and future research focus is made.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of Key Findings

This study sought to evaluate the efficiency of the environmental incident reporting protocol of South Africa through identifying challenges and avenues through which effective Environmental incident reporting could be achieved. Furthermore, the institutional and policy frameworks within which effective environmental incident reporting could be propagated, supported and enhanced was investigated. The study also went further to identify the barriers that hinder effective environmental incident reporting in South Africa and also sought to understand ways by which the reported environmental incidents were actioned and closed out by the relevant environmental authorities in South Africa.

In attempting to answer the research questions, the Environmental Management Inspectors (EMIs) who are the people responsible for environmental incident reporting at the Department of Environmental Affairs and Environmental Officers from various companies studied were engaged as research participants. The National Environmental Compliance and Enforcement Reports (NECER) were also considered to understand the institutional framework for environmental incident reporting, from which the reporting trends where analysed. The NECER revealed that not all sectors participate in environmental incident reporting. A survey and interviews were also conducted where the research participants were asked to share their experiences in environmental incident reporting and the results indicated that the industries that are supposed to be reporting are not familiar with the protocol or process. The study revealed that little or no training/awareness/support initiatives were in place to make environmental incident reporting popular amongst industries and members of the public.

The study also revealed that the Environmental Management Inspectors who are supposed to be implementing the protocol are confused about how the process should be implemented, in the absence of the implementation guidelines. The process seems to be marred by a lack of clarity on thresholds, definitions, and timeframes for reporting and the duration for actioning and closing out the reported cases from receipt of the initial report. The study also revealed that inadequate human and financial resources are provided for the implementation of the environmental incident reporting protocol. The study further revealed that the current resources only allow the current EMIs to major on reactive inspections leaving proactive ad-hoc inspections, awareness training and following up on reported cases to ensure they are actioned and closed out neglected.

Another key finding noted was that of the lack of clearly defined roles/ responsibilities and jurisdiction of the three government spheres that are national, provincial and municipalities in terms of ‘who should respond to which incident and where' (i.e. first, second and third respondent) in case of environmental incident reporting. It was noted that in the legislation, the local government is allocated the responsibility of being the ‘first responded' but it is not capacitated to fulfil that function. It was also revealed that in many instances the roles of the three overlap or leave gaps that affect the way environmental incident reporting is managed. The study also revealed that the environmental incident reporting process is currently not standardized. It was noted that the way incidents were actioned and closed out and the availability of training initiatives vary from national and from one province to another. Until such time that the identified challenges are addressed through various interventions like developing relevant policies dealing with environmental education, Key Performance Indicators for EMIs, and stringent sector reporting requirements amongst others efficient environmental incident reporting will remain a mystery in South Africa.

6.2 Recommendations

In this section, a few recommendations are made for the improvement of the efficiency of the current environmental incident reporting protocol of South Africa. It was revealed in section 6.1 that little or no initiatives are in place to promote industries and public awareness on environmental incident reporting. To address this shortcoming, it is recommended that an awareness program be rolled out by the Department of Environmental Affairs for both the public and private sectors to promote awareness. The International Association for Impact Assessment South Africa (IAIAsa) was identified as a suitable organization that can be engaged to champion this awareness program based on their reason of existence that is to provide leadership in Integrated Environmental management in Sothern Africa through continued professional development and offering training to its members and the public. The awareness program can be rolled out in all provinces and should include all IAIA members and members of other professional bodies like the South African Council of Project Management Professions (SACPCMP) and the Health Professions Council of South Africa (HPCSA) and all potential polluting companies. The SACPCMP and the HPCSA are bodies that keep a register for people that may be directly involved in environmental incident reporting, like Environmental Officers and Environmental Health Practitioners.

The study also noted that the current environmental incident reporting protocol lacks clarity in a number of aspects like timeframes, thresholds, and definitions. It is recommended that the reporting requirements in Section 30 of NEMA are revised by the Department of Environmental

Affairs to provide clarity on such matters. It was also noted that the protocol lacks the ‘how to do' guidelines for implementation. It is recommended that the process of finalizing the guidelines that are currently under development is accelerated by the Department of Environmental Affairs for effective environmental incident reporting to be achieved. This guideline should also provide full clarity on matters of definitions, timeframes, and thresholds that were identified as lacking and it should not introduce new provisions outside those on the legislation.

The study also revealed that inadequate EMIs and financial resources are provided for the implementation of the environmental incident reporting protocol. It is recommended that a budget is allocated by the Department of Environmental Affairs that can be utilized in cases where incidents are reported and transgressors are not identified to carry out clean up. The Department of Environmental Affairs should also ensure adequate EMIs are appointed and capacitated for them to be able to fulfil their functions without lacking.

Another key finding noted, was that of the lack of clearly defined roles/ responsibilities and jurisdiction of the national, provincial and local government. It is recommended that the Department of Environmental Affairs and other spheres of government develop an internal guideline that stipulates the roles and responsibilities of each government sphere to ensure the roles do not overlap. In developing this guideline, the EMIs should be consulted to give input on the challenges posed by the current institutional arrangement. The study also revealed that the environmental incident reporting process is currently not standardized. It is recommended that strong corporate governance be established between all the 3 spheres of government to enable efficient monitoring and enforcement of environmental incident reporting. This can be achieved through establishing an environmental incident reporting forum that comprises of representatives from all spheres. It is suggested that this forum can meet quarterly and on the agenda items the forum can discuss issues of harmonizing governance, special incident cases, lessons learned and information sharing amongst others. An EMI support unit other than the one that provides legal and technical support can also be established to deal directly with challenges the EMIs face on a day to day basis in Environmental incident reporting.

It was also noted that not all sectors participate in environmental incident reporting. To encourage industries to participate, it is recommended that a performance-based incentive scheme be introduced by the government. The incentives may probably be linked to tax rebates or similar where industries that report can enjoy the cost-benefit of environmental reporting. Another way of ensuring the involvement of industries can be through mandating all

potential polluters, not just those with Environmental Authorisations (EAs) to employ the services of Environmental Control Officers to manage environmental incident reporting in those companies.

6.3 Future Research Focus

It was noted that the literature on environmental incident reporting is deficient in scientific research both nationally and abroad. The research considered mostly environmental reporting literature as a whole, as literature specific to environmental incident reporting was scarce. It was also noted that the environmental reporting literature available mostly focused on reporting in annual reports by Stock Exchange listed companies and environmental reporting by private and unlisted companies has not received much attention. Further research can focus specifically on environmental incident reporting including reporting by private companies and specific industry sectors (i.e. construction, manufacturing, energy generation, and transport).

The study focussed on environmental incident reporting to the DEA as the organization that drives the reporting process, future research can focus on environmental incident reporting in all spheres of government including municipalities. The study also focussed mainly on environmental incident reporting in terms of the NEMA Section 30 requirements and DEA, future research can focus on the environmental incident reporting requirements of other legislation like the NWA and the DWS.

This research was conducted by the use of interviews and questionnaires and access to the actual environmental incident reports for content analysis was denied by the study organization, further research into this subject, by collecting actual incident reports and use of case studies of how specific incidents are handled or have been managed in the past can give more insight into the topic.

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Appendix A

INTERVIEW SCHEDULE FOR PUBLIC AUTHORITIES

INTERVIEW QUESTIONS ON THE EFFICIENCY OF ENVIRONMENTAL INCIDENT REPORTING IN SOUTH AFRICA

Part 1: Background Information

1. Age: _____
2. Sex: _____
3. Job role and responsibilities?
4. How long have you been in your current role? _____
5. Are you directly involved in environmental incident reporting: Yes ☐ No ☐

Part 2: Experience in Environmental Incident Reporting

1. What has your experience in environmental incident reporting been?
2. In your view, how is incident reporting received by industries?
3. Are the incident reports you have dealt with, reported by the use of the standard template provided by your organization?
4. If different templates are used, in your view what do you think is the reason the inconsistency in the environmental incident reports submitted by different companies?
5. In your opinion, do you think industries are familiar with the environmental incident reporting requirements?
6. What initiatives/training/support, if any, does your organization offer to industries to promote effective environmental incident reporting?
7. In your view, how effective are those interventions?
8. How, if at all, do you think the interventions could be improved?
9. In your experience, do you think industries honestly disclose the severity of the incident impact without fear of clean-up costs?
10. What do you think about the current environmental incident reporting protocol of South Africa?
11. Is there a stipulated timeframe of for investigating and closing out the reported environmental incident cases? If so are all cases investigated and closed out within the set time frame?
12. In your opinion what barriers or challenges do you think exist in the environmental incident reporting process?
13. How, if at all, do you think the current environmental incident reporting process could be improved?
14. Is there anything else you would like to add to your responses?

Appendix B

QUESTIONNAIRE FOR ENVIRONMENTAL OFFICERS

QUESTIONNAIRE ON THE EFFICIENCY OF ENVIRONMENTAL INCIDENT REPORTING IN SOUTH AFRICA

Part 1: Personal Information

6. Age: _____
7. Sex: _____
8. Current Position: _____
9. Years in the position: _____
10. Are you directly involved with environmental incident reporting: Yes ☐ No ☐

Part 2: Experience in Environmental Incident Reporting

15. How many environmental incident reports does the organization receive annually? _____
16. How many environmental incident cases to you deal with as an individual Environmental Management Inspector annually? _____
17. Are you familiar with that standard template used for environmental incident reporting? Yes ☐ No ☐
18. If answered Yes on question 3, do the reporting industries use a standard reporting template? Yes No ☐ ☐
19. If answered No in question 4, what do you think is the reason the inconsistency in the environmental incident reports submitted by different companies? Provide a brief answer on the space provided below.
20. In your opinion, do you think industries are familiar with the environmental incident reporting requirements? Yes ☐ No ☐
21. In your experience, do you think industries honestly disclose the severity of the incident impact without fear of clean-up costs Yes ☐ No ☐
22. Are there any initiatives you are aware of, in place at both national and provincial levels to promote effective environmental incident reporting? ☐ Yes ☐ No
23. If answered yes in question 8, please mention them on the space provided below.
24. What do you think about the current environmental incident reporting protocol of South Africa? Adequate ☐ Improvement required ☐

25. Have all the environmental incident cases you have received in the year 2015/2016 been investigated and closed out? Yes ☐ No ☐
26. If answered No in question 11, provide reasons for the delay on the space provided below.
27. In your opinion what barriers or challenges do you think exist in the environmental incident reporting process? Provide a brief answer on the space provided below.
28. What recommendations can you make for the improvement of the current environmental incident reporting process?