

https://dspace.org/

Environmental compliance and sustainability in South Africa: a study of the transport industry in Johannesburg

Tshiunza, Rachel

2019
https://hdl.handle.net/10539/29482

Downloaded from a DSpace repository. https://dspace.org/



Science Faculty
School of Geography, Archaeology and Environmental Studies
University of the Witwatersrand, Johannesburg.

Masters of Science (Dissertation)

ENVIRONMENTAL COMPLIANCE AND SUSTAINABILITY IN SOUTH AFRICA: A STUDY OF THE TRANSPORT INDUSTRY IN JOHANNESBURG.

By
Rachel Tshiunza
Student Number: 542341
Supervisor: Prof. Mulala Danny Simatele

A dissertation submitted to the Faculty of Science, University of the Witwatersrand Johannesburg in fulfilment of the requirements for the Degree of Masters of Science (Geography and Environmental Studies).

27 August,2019.



Source of picture: https://www.enveraconsulting.com/future-environmental-compliance/

Table of Contents

LIST OF FIGURES I

LIST OF TABLES II

DECLARATION III

ABSTRACT IV

ACKNOWLEDGEMENTS V

ABBREVIATIONS VI

CHAPTER ONE 1

INTRODUCTION AND FRAMES OF REFERENCE 1

1.1 Background to the study 1
1.2 Thematic consideration 2
1.3 Research Questions 5
1.4 Research Aim and Objectives 6
1.5 Theoretical considerations and Literature review 6
1.6 Methodological Consideration 8
1.7 Scope of the Study 9
1.8 Ethical Considerations 11
1.9 Structure of the Dissertation 11

CHAPTER TWO 13

THEORETICAL CONSIDERATION AND LITERATURE REVIEW 13

2.1 Introduction 13
2.2 Definitions of key concepts 13
2.3 Environmental Management and Compliance: A Global Perspective 15
2.4 Environmental Management and Compliance: A Sub-Saharan African Context 21
2.4 Environmental Management and Compliance: A South African Context 22
2.5 Gaps in Literature 24

CHAPTER THREE: 27

METHODOLOGICAL CONSIDERATIONS 27

3.1 Introduction 27
3.2 Research philosophy 27
3.3 Research Design 29
3.3.1 Research Site/Description of Source of Research 31
3.3.2 Study population and Sampling Process 34

3.3.3 Data Collection tools 36
3.3.4 Data Analysis 37
3.4 Methodological Reflections 38

CHAPTER FOUR 40

EMPIRICAL EVIDENCE 40

4.1 Introduction 40
4.2 Overall Resulting themes from the Study's Data Collection 40
4.3 Conclusion 57

CHAPTER FIVE 59

ANALYSIS AND DISCUSSION 59

5.1 Introduction 59
5.2 Perspectives on challenges facing environmental compliance in the transport industry in South Africa. . 59
5.3 Alternatives to facilitate environmental compliance in the Transport industry in South Africa 62
5.4 Pursuing effective environmental compliance in South Africa 63
5.5 Environmental compliance as an opportunity for environmental sustainability in South Africa 65
5.6 Conclusion 67

CHAPTER SIX 69

CONCLUSIONS AND RECOMMENDATIONS 69

6.1 Introduction 69
6.2. Summary of key findings 69
6.3. Conclusions 71
6.4. Recommendations 71

REFERENCES 74

APPENDIX 1: LIST OF INTERVIEWS CONDUCTED 80

APPENDIX 2: INTERVIEW SCHEDULE 81

APPENDIX 3: CONSENT FORM 83

APPENDIX 4: PARTICIPANT INFORMATION SHEET 84

List of Figures

Figure		Page
Figure 3.1	Summary of Chapter 3	29
Figure 3.2	Map of Gauteng and Johannesburg	34
Figure 3.3	Map of the City of Johannesburg Municipality	34
Figure 3.4	Map of the routes the Rea Vaya takes in Johannesburg	35
Figure 4.1	Organization chart of the Rea Vaya Project	45
Figure 4.2	The sectors that the participants belong to.	46
Figure 4.3	The number of years working in environmental compliance	48
Figure 5.1	Graph of the elements of a possible ECMS	69

List of Tables

Table		Page
Table 3.1	Table of the methods used to answer the research questions	33
Table 4.2	Summary of the environmental legislation	42
Table 4.2	Summary of the environmental legislation	49
Table 4.3	Legislature associated with the Rea Vaya	51

Declaration

I declare that this thesis is my own, unaided work. It is being submitted for the degree of Master of Science at the University of the Witwatersrand, Johannesburg I further declare that this thesis has never been submitted before for any degree or examination at any other university.

Signature



Rachel Tshiunza

Abstract

Environmental compliance has surfaced as being an important tool in environmental management and environmental sustainability, in not just South Africa but in many other parts of the world. It is evident that compliance occurs at various levels of government, but until recently it was only dealt with at a national and provincial level. Environmental compliance has become a crucial component of local governments such as municipalities, and has brought to the fore the importance of the role that local governance has in environmental sustainability. Literature shows that there is still very little research done on the local scale regarding environmental compliance, moreover the benefits it may have for environmental sustainability on a local, national and global scale. This evident lack of research in the field does not negate the need for its advancement. Environmental sustainability, is largely dependent on legislation, policies, and institutional frameworks that operate together harmoniously. Considering the general laissez fair attitude towards environmental degradation and its association to compliance in Africa. It is believed that a positive shift towards enhanced environmental compliance could be beneficial for future generations.

This research project has sought to understand the perceived challenges and opportunities for environmental compliance and environmental sustainability in the South African Context. This is done on the backdrop of the City of Johannesburg Municipality's new Rea Vaya (Bus Rapid Transit system) project which was initiated to curb environmental issues such as air pollution created from congested roads and outdated bus engines. Through the usage of semi-structured interviews with environmental practitioners along with document analysis, data was obtained for the study. The Interpretivist approach allowed for the lived experiences of the environmental practitioners to be studied, and interesting elements of character, legislative loop holes, power dynamics and development misconceptions were identified. It is evident that the role of environmental compliance is crucial in efforts towards environmental sustainability however, the system needs to enforce some changes on the ground that will hold entities accountable for their actions.

Key words: Environmental compliance, environmental sustainability, environmental management, legislature.

Acknowledgements

First and foremost, I would like to express a deep gratitude and admiration to my excellent supervisor, Prof. Mulala Danny Simatele, who has been more than amazing throughout my research journey. His contribution has been immeasurable. I would not have been able to do this without his exceptional guidance. He facilitated to make this research which has always been a dream of mine, a tangible reality. The dedication expressed throughout this research allowed an idea to eventually manifest itself as a completed thesis. The full encompassing aid he gave me though constructive criticism draft after draft, to providing me funding to aid me in my data collection stage as I was pregnant and unable to conduct the research as I normally would of like too. His encouragement even when I was willing to give up was moving. In all sincerity this dissertation would have not been the same without him.

Secondly, I would like to thank the City of Johannesburg Municipality's department of environment and infrastructure, who were so eager to be a part of the research study. Your contribution was truly appreciated and I hope that this thesis makes you proud to have been a part of the journey. I would also like to also thank my husband Yannick who constantly reminded me of my dream to one day become a professor, and helped to keep this dream alive.

Lastly but equally as important, I would like to dedicate this body of work, which in most times felt like a baby, to my new born daughter Annie-Elizabeth. I hope that she grows up inspired by me, and realizes that as a black female, you can also reach heights that you never thought you could. This journey was so edifying and taught me so much, that I hope I will one day impart to many.

Abbreviations

BRT – Bus Rapid Transit

CoJ – City of Johannesburg

DEA - Department of Environmental Affairs

DEAT - Department of Environmental Affairs and Tourism

EC – European Commission

EIA – Environmental Impact Assessment

EMP – Environmental Management Plan

EMS – Environmental Management System

GDARD – Gauteng Department of Agriculture and Rural Development

GHG – Green House Gases

GPEP – Green Paper on an Environmental Policy

INECE – International Network for Environmental Compliance and Enforcement

NEMA – National Environmental Management Act

NESREA – National Environmental Standards and Regulations Enforcement Agency

NEPA – National Environmental Policy Act

OECD – Organization for Economic Cooperation and Development

SAPS – South African Police Services

SEMA – Specific Environment Management Act

WPEMP – White Paper on an Environmental Management Policy

Chapter One

Introduction and Frames of Reference

1.1 Background to the study

How humans have traveled has drastically changed throughout the course of time. This evolution has been hugely beneficial for the advancement of human beings and society. However, this advancement has come with environmental disturbances. King and Lessidrenska (2009) state that the usage of land (such as for transportation) for the betterment of the quality of life of humans, in the 20th century has rapidly increased all over the world. The usage of terrestrial surfaces for development projects which are often economically inclined have had a variety of environmental issues associated with it, such as decreased water and air quality, increased pollution and greenhouse gas (GHG) emissions, exhausted natural resources, and global climate change. These effects may be considered as by-products of what may be characterized as purposeful human activities such as for example, agriculture, mining, settlements, transportation or recreational facilities (King and Lessidrenska, 2009).

There is undoubtedly an increasing concern that the remarkable growth of urban spaces which frequently requires the development of associated transport systems is physically disadvantaging the natural environment. Moreover, transport systems have been attributed to adverse alterations to the social, economic and environmental spheres. According to Rodrigue et al. (2017), the transport industry is reasonably argued to be one of the significant contributors of increased GHG emissions, acidification of productive soil and rain, local air pollution, traffic congestion, overpopulation, road accidents, and ecosystem destruction. These are typically all key components associated with rapid urbanization. The critical problem with rapid urbanization is the problematic notion that much of the urbanization occurs in isolation, disregarding efficient environmental management planning which is essential for sustainable development.

Historical instances of altered environments that result in environmental issues created the classic formulation of the precautionary principle which according to Lloyd (1994) is carefully described as the fundamental notion that human activity is likely to have potential ramifications on nature, and society should typically assume that this impact is of an adverse kind. Therefore, this precautionary measure called for a responsible means of developing, which is now known as sustainable development. It is estimated that sustainable development prompts an ideal platform for environmental compliance and environmental management in the transport industry. In addition, environmental compliance allows for accountability with regards to the impacts that human activities like that of transportation, for example, may have on the environment and furthermore, necessitates environmental laws for not only companies but also all the other institutions and organizations to promote sustainable development (King and Lessidrenska, 2009).

Environmental compliance remains a key instrument that stems from the need to carefully regulate how humans interact with the natural environment. It, therefore, acts as a support

for environmental governance goals such as needed transparency and accountability (Fakier et al, 2005). Additionally, environmental Compliance is argued by Adebayo et al. (2015) to be the adherence to environmental laws, standards, policies, and regulations associated with the environment. It is believed that the rapidly growing population numbers alongside the consumerism culture evident in urban environments have led to the increased demand for infrastructural needs for mobility. This demand has made the transport industry a paramount concern to climate change issues and environmental management. Nevertheless, it is comprehensible that transport and environmental issues are inseparable, and the transport industry is essential for a society to thrive. However, the environmental issues that are a derivative product of these transport systems are the very same concerns that would inevitably destroy the potential of society (Adebayo et al., 2015; Rodrigue et al., 2017).

It is imperative to possess elaborate systems that ensure environmental compliance that is in line with the demand that society has for local policies that prioritize a high level of environmental protection alongside vigorous economic growth and social wellbeing (Organisation for Economic Co-operation and Development - OECD, 2008). Because of this demand Environmental compliance has become an increasingly import area of academic research in the complex field of environmental management. According to Tarantino (2007), strong environmental compliance principles and effective enforcement are obligatory to an established government's ability to adequately protect the public and the environment. Therefore, environmental compliance represents a prominent role in environmental management as it aids in facilitating good governance for ecosystem management and sustainable development.

When referring explicitly to the transport industry, there is a general disparity between legislation bearing to environmental management and its effective implementation in the transport industry (Van Wyk, 2007). This prevailing trend is evident in many parts of the world and in developing countries like South Africa. In South Africa, the Department of Environmental Affairs (DEA) annually produces a National Environmental Compliance and Enforcement Report (NECER). The report looks at the considerable advancements and challenges experienced regarding environmental compliance in South Africa (Department of Environmental Affairs- DEAT, 2015). Nonetheless, regardless of the apparent attempts to refer to the situation like NECER, South Africa is not sufficiently moving towards critically enforcing adherence to the environmental legislation. This lack of adherence is intentionally slowing down progress in the notion of effective environmental management which pays tribute to environmental sustainability (Van Wyk, 2007). Based on this observation the fundamental question that instantly arises is how do we improve wonderfully environmental compliance and ensure it to ostensibly promote environmental sustainability?

1.2 Thematic consideration

South Africa has had its fair share of environmental challenges. Middleton (2011) argues that these challenges have been a product of development projects which have had various impacts on not just the physical environment but the social and economic environment too. Given this King and Lessidrenska (2009) state that the development of the industrial economies has provided a platform for the exploitation of natural resources which is associated with the capitalistic and hegemonic discourse evident in the structures of society.

This exploitative pattern has led to deforestation, desertification and ripple disruptions in ecosystem functions vital for various species as well as human beings.

South Africa represents a rapidly developing country which is uniquely characterized by a socio-historical background that is tainted by the effects of the apartheid regime (Goondiwala, 2014). This oppressive regime affected all spheres of society including transportation. The roads and streets were meticulously constructed in an unusual way that did not truly accommodate public transport but rather focused on specific individuals acquiring their own personal vehicles. The apartheid-led government was of the view that public transport was ordinarily associated with the black community. Therefore, in relentless efforts to unjustly deprive the disadvantaged community of people of colour, very little planning or resources were invested in adequately developing public transport systems (Goondiwala, 2014). Therefore, because of this post-apartheid, there is a significant demand for efficient public transport systems. In addition, a need for a change in values of the society to promote eco-transport systems like the Rea Vaya (CoJ, 2015).

The specific need for eco-transport systems is also associated with the evident environmental impact the transport industry invariably has. It is contested from an atmospheric point of view, that there was a driven spike in the carbon dioxide levels in the air (Yiqi and Moonley, 1999). The remarkable rise was by at least a third (King and Lessidrenska, 2009). The elevated concentration of carbon dioxide was revealed to have increased from 275 ppm to 365 ppm and was expected to continue doubling. One of the principal sources of this carbon dioxide is the transport industry. The land use point of view presents evidence in the change of Earth's surface. The Earth’s surface which was recorded to cover over 2 billion hectares of forest and 1.3 billion of grassland, is now covered by urban areas or cropland (OECD, 2008). This modification of land for human usage has induced considerable challenges across various elements of existing ecosystems and has led to rapid environmental changes (Soon et al., 1999). These environmental changes have been argued to lead to overall land degradation and desertification. This has been scientifically documented as carrying environmental implications like ecosystem destruction, affected water bodies, air quality issues and social implications like the detrimental health effects. Environmental issues such as land degradation and desertification have become undoubtedly tremendous concerns in South Africa (DEAT, 2007).

The water perspective argued by Machette (2011) who is of the view that increased urban development has contributed to water shortages due to the inflated consumption, pollution and wastage associated with the escalated population numbers in an already drought-prone - South Africa. Furthermore, transportation has been argued by Rodrigue et al. (2017) to impact the quality of water, however according to Trumbull and Bae (2000) the transportation sectors impact on water pollution is not yet fully understood or well defined. The transportation directly affects the quality of water in distinct ways, 1) It is believed that road construction and maintenance can negatively affect surface runoff, lower ground water recharge rates, and elevated erosion rates; 2) Various pollutants such as vehicle exhaust, oil and dirt are deposited on roadways. Pollutant levels of water due to traffic congestion and vehicles is

much higher in urban areas than in rural ones, and urban sprawl has been associated with increased water pollution from the transport industry (Trumbull and Bae, 2000).

In view of these environmental issues efficient environmental management is required from a legislative and institutional point of view. Traditionally the approach to environmental management in South Africa was purely about creating environmental laws and policies that benefited the minority which was the white people and looked at the environment in a purely physical manner (DEAT, 2015) which served to be problematic. Therefore, this problem created the need to have laws and policies that were far more progressive by being as inclusive of the public as possible, thus birthing the National Environmental Management Act (NEMA) of 1998. This act provides one with much of the underlying framework for environmental law in South Africa. Environmental law has norms associated with it. In South Africa, most of these are related to the management of the environment in aims to promote environmental sustainability through effective environmental management. Legislation that speaks directly to environmental management includes the National Parks Act, the Air Quality Act of 2004 (DEAT, 2017) and others which will be elaborated on in the chapters ahead.

Despite the multitude of legislature pertaining to environmental management and sustainability, there is still the issue of abidance to these sophisticatedly constructed environmental laws. It is useful to engage with how historically there have been sparked controversies regarding nature and society, and more especially with the notion that these are terms that are becoming increasingly inseparable (Morelli, 2011). This idea is highlighted when one looks at the context of the Gauteng province which is becoming highly urbanised. The Gauteng province is perceived as being the economic hub of the country and a place that offers opportunities on for employment and business at various levels. These perceptions have been documented as dating back as far as the apartheid era (DEA, 2011). Nevertheless, this status comes with various implications for the environment. According to Van Wyk (2007), the more people migrate to the Gauteng province, the greater the demand for land resources. Therefore, with this demand comes a call for an environmental protection framework that may aid in managing the resulting spiked urban development associated with the accelerated population growth.

According to the DEAT (2007), the rapid urbanisation experienced in Gauteng carries with it the need for more roads, shopping centres, electricity, food, water, housing, schools, and hospitals. These injected needs are all pulling factors that contribute to the migration of people into cities, forcing local government to provide more of these benefits or ‘needs’ at a faster rate. This increased rate of urban development is suggested to result in pressure on the land and other natural resources. Based on this interaction between nature and humans many organizations now have more of a significant impact on the environment. These impacts instigate environmental issues such as urban sprawl, soil erosion, soil degradation, salinisation, and desertification which significantly affect both nature and society (King and Lessidrenska, 2009). In view of these mentioned effects of transport, it is important to understand and engage with the extent to which environmental compliance is ensured in industries in South Africa such as transport.

The importance of an industry like the transport industry is far stretching especially in a city such as Johannesburg. Urbanization, multinational corporations, and economic globalization are all forces that shape and take advantage of transportation at various often interlinked scales. Therefore, what comes to the fore here is the notion that the fundamental purpose of transport is geographic in nature. This is because it facilitates the movement between various locations and connects spaces. Transportation is pivotal as it represents one of the most significant human activities across the globe. It is intricately woven as an essential component of the economy and key support for spatial relations between locations that are of a global, regional and local scale. According to the Department of Transport (DoT), transport services support economic growth and development through the connection of people and goods to markets. This view of transport is critical as it sets a background that this thesis is in agreement with.

Fortifying environmental compliance systems and enforcement has become a significant topic in environmental governance and sustainability. The OECD (2006) states that there is a growing need to create approaches for governments that optimize the costs of assuring environmental compliance, more especially in developing countries like South Africa. For that need to be satisfied one should engage with the notion that institutional, policy and legal frameworks play a pivotal role in advocating for efficient environmental management and governance (OECD, 2006), but harmonizing these components proves to be a daunting task for many countries. Nevertheless, this complexity should not deter countries from engaging with these concepts in attempts to best manage natural resources and promote environmental sustainability. Therefore, a more comprehensive, and collaborative approach that interacts with institutional frameworks on a formal and informal level is beneficial. As this will allow for enhanced environmental governance and the promotion of environmental sustainability. It is undeniable that people and the environment are inseparable, therefore the greater aim is to try match development with environmental sustainability (Jones, 2004).

Therefore, on the basis of the above arguments and considerations, this research has examined what are the institutional, policy and legal frameworks pertaining to the transport industry. Moreover, how environmental compliance is or can be assured and enforced to promote environmental sustainability. This was accomplished by looking at a case study of the Rea Vaya Bus Rapid Transit in the City of Johannesburg Municipality.

1.3 Research Questions

Therefore, based on the previously mentioned thematic considerations the following questions guided the research process:

I. What institutional frameworks exist within which environmental compliance can be pursued in South Africa?
II. What legal frameworks exist which speak to environmental compliance in South Africa?
III. What are the social and environmental repercussions of the lack of adherence and enforcement of environmental laws and policies in South Africa?

IV. In what ways can environmental compliance be used as a tool to promote environmental sustainability?

1.4 Research Aim and Objectives

The Aim of this study was to investigate the challenges and opportunities for environmental compliance and sustainability within the context of the transport industry in Johannesburg.

In light of the above aim the objectives of the study were:

a. To identify the challenges that exist within environmental compliance in the transport industry in South Africa and how they affect environmental sustainability through the study of the Rea Vaya.
b. To establish alternative ways to enable and facilitate environmental compliance with regards to the transport industry in South Africa in order to promote environmental sustainability.
c. To suggest how effective environmental compliance in the transport industry can be pursued in South Africa, as a tool to promote environmental sustainability.
d. To better understand and contribute to the body of knowledge on environmental compliance and environmental sustainability of the transport industry in South Africa.

1.5 Theoretical considerations and Literature review

Theoretical considerations are essential in order to create a landscape of the different views that exist around environmental management and compliance. This allows for the study to be strategically positioned in the field of environmental studies. The study is not particularly aimed at investigating the usefulness of environmental legislation and the technicalities of environmental legislature and regulations, this does not mean that we negate the importance of those components but to rather focus on contributing to environmental sustainability and how spaces are impacted by the environmental legislation and regulations (tools for environmental sustainability) and how these are complied with. The term literature review is defined by Ridley (2013) as being the chapter of the dissertation where there is in depth referral to research and theory in the field of interest.

There are various possible interpretations of terms used in environmental literature, which are often dependent on key elements like the philosophical stance and language. For instance, according to the Open University (2012), it is disputed that terms like sustainable development and sustainability are used interchangeably depending on the appropriate context. As a consequence, it is credibly debated that sustainability can be ordinarily seen through the ecological, economic, financial, social, political and institutional lenses. Therefore, this array of definitional parameters calls a need to define some key concepts that will be evident in the remainder of the dissertation. For instance, environmental

management, which for the purpose of this study is outlined by Barrow (2005) as a process focused on human-environment interactions. Furthermore, it seeks to pinpoint what is environmentally appropriate and what are the social, economic and technological constraint hindering achieving it.

For the purpose of this study, the driving force was to typically couple the prevailing view of environmental management with the Integrated Environmental Management (IEM) approach. IEM is defined by the Department of Environmental Affairs and Tourism (2004) as a holistic framework or approach that sufficiently encourages all sectors of civil society to voluntarily participate in the objective assessment and effective management of environmental impacts. Over and above that, to engage with the factors associated with various stages of the activity life cycle, with the general aim of promoting sustainable development.

Compliance is a component associated with various disciplines, but for the purpose of this study environmental compliance remained the focus. This is defined as adhering to environmental laws, policies, regulations, and standards (NEMA, 1998). However, it is claimed that compliance exists alongside enforcement (NECER, 2016). Nonetheless, this research is equally interested in a key component, and that is sustainability. Sustainability is outlined with great ambiguity from the differing literature that attempts to define it (please refer to chapter 2). However, the most comfortable definition that speaks to the study was that of Thiele (2013) - which characterizes sustainability as a pliable component attached to science, with the hopes of including an ethical element to its progression and involves developing responsibly. A more isolated elaboration is evident in chapter two. This view of sustainability is significant in environmental studies because it connects the ethical constituent to the development of spaces, therefore allowing for a sense of responsibility to trickle into how spaces are engaged with and how they are utilized or reconstructed. This sense of responsibility becomes applicable to not just the policymakers, government agencies, corporate, but down to individuals and grass root members of society, which is an essential component for sustainability.

The focal area of the dissertation was environmental management and compliance, and this was contextualized in the global scale by looking at studies conducted in countries like China, which is also known as a rapidly developing country like South Africa. In China, the research suggested the transport industry also had a significant impact on the environment, and the lack of efficient environmental compliance has compounded on the threat that the transportation poses to the environment and to human health. In Europe, there is a similar pattern of the need for the assurance of environmental compliance to promote environmental management goals. They are plagued with the existence of environmental legislatures, deemed to be beneficial, however, it carries a lag due to the lack of it being practical and feasible on the ground. This is a trait that is not unique to developed countries in Europe but is also seen in many other developing states such as Brazil, Nigeria, and Kenya.

In South American countries, like Brazil, there are various developmental necessities like increasing public transport options and properly making them reliable. Therefore, these fundamental requisites are deemed as being more pressing issues that are viewed to outweigh the essential need to safeguard the environment. The chief priority is placed on rather being able to travel from A to B safely and quickly (please refer to chapter 2). However, the long-

term perspective does not have room for this logic of thought. It is believed that eventually, unsustainable transport systems impact society's productivity, health and ecological environment that provides services to the general public (Sharma and Kumar, 2012). We next considered the sub-Saharan Africa context by looking at the case of Kenya and Nigeria. Then finally viewed the local context in South Africa which touched on the environmental legislative elements and the efforts that were made to address the inadequacies associated with the compliance of the environmental legislation and regulations.

The critical engagement of literature that talks to environmental compliance and environmental management and in a similar breath that also speaks to the transport industry is noted as not being as exhaustive as one would like. It is disputed that it has been up until now an emerging area of research that suggests the need for increased research which articulates both components. Conversely, Compton et al. (2013) mention that predominantly there is plenty of literature that speaks to environmental management mechanisms and their practical usefulness in ostensibly promoting environmental management. These tools can either be legally binding instruments, economic instruments, or communication instruments and are all designed to make environmental management practical (Compton et al., 2013). However, the INECE (2009) mention that legal instruments for environmental management are not as effective as they should be globally hence resulting in a distinct lack of significant environmental compliance, therefore sparking considerable interest to undertake research in this field.

1.6 Methodological Consideration

The different methods that were utilized during the conduction of the study were of a qualitative nature. These tools were selected as we were interested in collecting data using an interpretivist philosophical approach. This approach is interested in identifying the lived experiences of the respondents. Furthermore, this approach is known as being multifaceted as it draws from theories such as ground theory.

The study employed qualitative methods such as interviews and document analysis as these were able to aid the researcher in engaging with the knowledge that exists and also aided with the identification of gaps that may also exist. The research tools were specifically used to answer each of the research questions stipulated in chapter one of the dissertation. The tools used were very useful but also had some limitations that future researchers could use as opportunities to further contribute to the body of the knowledge that the study is concerned with. However, these limitations included the inability to access admissible stakeholders due to their availability and the cancelling of commitments made. Furthermore, the lack of environmental compliance capacity in Johannesburg, and the inability to get sufficient literature that spoke to environmental compliance and the transport industry in South Africa moreover the Rea Vaya BRT project proved to be a restriction for the research conduction.

The sampling method that was utilized for the study in order to identify the relevant stakeholders that are involved in environmental compliance and environmental management was the snowball effect or also known as chain sampling. This method was most appropriate

as getting access to the necessary stakeholders that are involved with environmental compliance were not easy to access or find. However, the steps that guided this process are elaborated on in chapter three. There were 20 stakeholders that we interviewed with the use of semi-structured interviews, with particular topics as highlighted in the interview schedule attached to the appendix. These interviews were supported with an engagement of the relevant documents that speak to environmental compliance and sustainability and document analysis as mentioned in the methodology chapter of the dissertation.

Once the empirical data was collected through extensive interviews with the necessary stakeholders, the data underwent possible interpretation, which appropriately included the investigative technique of thematic analysis. Prior to the content analysis, coding occurred where categorization and memo acquiring methods were employed. However, the efficient method of thematic analysis was also employed in a document analysis of the comparative literature. In addition, deductions were made from the analyzed data, which later allowed for applicable recommendations and conclusions to be intentionally made regarding the extensive study.

Once the data was carefully collected through the qualitative interviews with the necessary stakeholders, the data voluntarily underwent evaluation, which included the method of thematic analysis. Prior to the thematic analysis, coding occurred where categorization and memo supporting methods were employed. However, the efficient method of thematic analysis was also employed in a document analysis of the academic literature. Furthermore, logical conclusions were correctly deduced from the analyzed data, which later allowed for applicable recommendations and logical conclusions to be carefully made regarding the study.

Once the qualitative data was collected through the interviews with the necessary stakeholders, the data underwent interpretation, which included the method of thematic analysis. Prior to the thematic analysis, coding occurred where categorization and memo examining methods were employed. However, the preferred method of thematic analysis was also employed in a document analysis of the academic literature. Furthermore, conclusions were correctly deduced from the analyzed data, which later allowed for applicable recommendations and practical conclusions to be made regarding the extensive study.

1.7 Scope of the Study

The Study focused on the investigation and review of the legal and institutional frameworks applicable to environmental compliance and sustainability, with a particular focus on the transport industry in the city of Johannesburg. The transport system that was targeted in the study is namely, the Rea Vaya Bus Rapid Transit (BRT) system. The Rea Vaya BRT is noted as one of the most commonly used post-apartheid public form of transportation in Johannesburg. However, besides it being useful to the Johannesburg community it also carries with it a direct interaction with the environment and thus requires a particular form of environmental compliance and inspection in order for it to operate successfully in the city of Johannesburg.

Therefore, the study involved the interviewing of relevant environmental consultants/officials that work with environmental management and environmental compliance privately along with government officials that oversee environmental compliance such as for example the Environmental Compliance Inspectors/ officers. These individuals gave some useful insight on the particular protocol involved in the investigation of environmental offences associated with environmental legislature but also breaches of terms and conditions of environmental permits issued in light of the South African environmental management legislature.

The Study also investigated what were the implications of non-compliance from a legal perspective, and what were the social, economic and environmental repercussions of this non-compliance. Furthermore, the study tried to identify the key elements that contribute to non-compliance in the transport industry and its relationship with environmental sustainability. The key areas of interest were nestled in the investigation of what legislature obligations that speak to environmental sustainability, systems that exist to aid in adhering to the environmental legislature, how environmental compliance was reported, how was it captured and what are the penalties involved when non-compliance is proven or identified?

These areas of interest were cross-examined using interviews and reviews of available secondary material such as reports provided by the relevant state and private agencies in South Africa. EIA reports available from the selected transportation system also helped to identify possible environmental implications and management strategies associated with the project and thus helped in assessing if these strategies indeed had been done accordingly. Furthermore, there was also a review of other literature that speaks to environmental issues associated with the above mentioned public system and how these have been mitigated or managed, and if not why has it not been done.

Moreover, the study was particularly interested in the Rea Vaya buses rather than any other type of public transport or mode of transport because much of the literature that was reviewed highlighted that road transport and its congestion is proving to have detrimental impacts on the environment and human health in various parts of the world. Therefore, there has been a global consensus on the improvement of public transportation, to create a more sustainable transport industry. The Rea Vaya bus system is an initiative in line with this general consensus and is solely designed for the Johannesburg region. It was introduced to the public as a far more sustainable alternative to private motor vehicles (Phalatse, 2012). One could have engaged with other initiatives such as the Gautrain Train Rapid Transit or the metro bus system but because of the important role, a city such as Johannesburg plays in the economy of South. Moreover, Johannesburg is characterised with its dense population which has resulted in highly congested roads created a compelling element that seasoned our investigation into environmental compliance and sustainability.

Furthermore, the study looked at environmental management and how it could be enriched with improved environmental compliance assurance and measures. The study also highlights the gaps that environmental compliance can fill as a tool for environmental management in

South Africa. The study engaged with the importance of the advancement of environmental management in South Africa and, brought to the fore the implementation gaps that were identified in environmental compliance. These gaps, in turn, were noted as being stumbling blocks towards environmental sustainability in South Africa.

1.8 Ethical Considerations

When research involves human participants, there is a need for ethical considerations to be incorporated (Philips and Johns, 2013). Ethics according to Mautherner et al. (2002) are described as being the ethical guidelines or process of attaining ethical approval from relevant academic or professional bodies before one begins collecting their data. For that reason, the following ethical considerations were incorporated to ensure that no ethical violations occurred during the data collection.

The nature of this study speaks to different stakeholders, therefore, ethical considerations were of utmost importance. The stakeholders required for this study included professionals and officials in the environmental management and compliance sphere. These ethical considerations included ensuring privacy, consent, confidentiality, anonymity, along with the option of withdrawal from the study. Phillips and Johns (2013) argue that institutional ethical clearance is mandatory in research and research cannot be conducted without this clearance. The institution that provided this clearance is the University of the Witwatersrand ethics committee, of which we submitted an ethical clearance application before any data collection commenced. Furthermore, the approved application generated the ethical clearance number H18/06/38 for this study. The ethical certificate is attached to the appendix.

It is essential to note that the researcher needs to be able to establish trust between him/her and the participants so as to guarantee that no harm shall come to the participants (Edwards and Holland, 2013). Therefore, we ensured that the research participation was consensual through the completion of a participant's form (attached in the appendix) along with a consent form (attached in the appendix) to confirm that they agreed to the terms of their participation. These two documents allowed for their anonymity and confidentiality to be confirmed. The interview process was handled with great sensitivity and the utmost care to avoid dire consequences. The attitude that we approached this study was focused on avoiding to play the researcher role but rather to come into their spaces open to learning as much as possible. This allowed for the reduction of any personal beliefs and preconceived ideas of what the participants should or should not say.

1.9 Structure of the Dissertation

This Dissertation is structured around 6 chapters. Chapter is the introductory chapter, which provides the relevance of the study. In order to understand the study's relevance, a background was required. This background touches on the significance of the adverse effects of anthropogenic forces on the natural environment and how the need to manage the

interactions between humans and the environment proves to be essential for sustainability. Furthermore, we have presented the thematic considerations for the study which essentially highlights the environmental issues that plague South Africa and some causes behind these issues furthermore, the importance of the transport industry in South Africa.

The transport industry serves an important role in the connection of people, places, and goods and services, therefore, vehicles for transportation become a crucial point of interrogation in efforts to manage the environment. Therefore, we looked at the Rea Vaya to help us investigate the importance of environmental management and compliance in the transport industry. This investigation was guided by the research questions available in subsection 1.3 and the research aims and objectives in subsection 1.4. We also provide a summarization of the material found in the remainder of the thesis such as the theoretical perspective and literature review, the methodological considerations, scope of the study, and lastly, the ethical considerations.

Moreover, we engaged with the literature available on environmental compliance and management touching on the effects that the transport industry has on the environment from a global, regional and local context in Chapter two. Chapter 3 looked at the methodological considerations, focusing on the interpretative approach which guided much of the study. There is a presentation of the research design which is a step by step guide of what was done in the conduction of the study inclusive of elements such as the study population, data collection tools, the data analysis and the methodological reflections. Chapter four engaged with the empirical evidence, offering the data collected through the interviews conducted with the participants and the documents reviewed, this was done in various ways inclusive of tables and graphs amongst others.

Chapter five titled Data analysis and Discussion, engaged with the data obtained in chapter four, unearthing crucial deductions and interpretations which demonstrated how the research aims and objectives from Chapter one were achieved. Finally, Chapter six which is the conclusions and recommendations, in this chapter we summarized the key findings from the study and then end the chapter with recommendations, which includes some suggested steps or actions that could be incorporated based on the conclusions that were made from the study.

Chapter Two

Theoretical consideration and Literature Review

2.1 Introduction

This Chapter of the dissertation presents the theoretical considerations and literature review. It was important for a study of this nature to be theoretically engaged with so as to strategically position itself in the global context, the regional context and the local context. This was done through engaging in the greater debates that exist around environmental compliance and sustainability. Therefore, this chapter has included subsections to aid in contextualising the study. The subsections found in this chapter include, the definition of some key concepts that will be present in the literature review chapter but also in the remainder of the dissertation, environmental management and compliance in the global context, environmental management and compliance in the sub Saharan context and lastly environmental management and compliance in the South African Context.

2.2 Definitions of key concepts

I. Environmental Management

Barrow (2005) defines environmental management (EM) as a term that cannot be mentioned without mentioning development, as he believes that these two terms are inseparable. Furthermore, he states that environmental management has the aim to understand the structure and function of the environment, simply put it is how humans engage with their environment and each other (Barrow, 2005). However, Kulkarni and Ramachandra (2006) describes environmental management as a term that is ambiguous in nature, as various authors have their own version of what environmental management can be defined as, or even what it entails. Kulkarni and Ramachandra (2006) are of the view that environmental management embodies the management of a variety of activities which may include environmental planning, conservation of resources, environmental status evaluation, and environmental legislation and administration. Furthermore, it is argued that environmental management should be more aimed at implementation, monitoring, auditing practices and more importantly real-world problems instead of theoretical planning (Kulkarni and Ramachandra, 2006).

Kulkarni and Ramachandra (2006) describe environmental management in two somewhat discrete ways, firstly as being a process that involves the allocation of natural and man-made resources in order to create the optimization of the environment, where basic human needs are satisfied in a sustainable manner. Secondly, as being a system-oriented process that includes the involvement of different professional from various backgrounds such as either natural science, social science, engineering, law, or even design attempting to resolve problems created in human altered environments using an interdisciplinary point of view (Kulkarni and Ramachandra, 2006)

Nevertheless, Fuggle (1990) mentions there is also the term integrated environmental management (IEM). The term integrated environmental management can be loosely defined as a probable philosophy and set of principles, that are supported by an array of environmental assessment and management tools, that are designed for the promotion of environmental sustainability (Fuggle, 1990). For the purpose of eroding confusion, we will use the definition provided by Barrow (2005) which states environmental management as a process that is focused on human-environment interactions, where it seeks to pin-point what is environmentally appropriate and what are the social, economic and technological constraint hindering achieving it. Furthermore, for this study we associate our view of environmental management with the Integrated Environmental management (IEM) as defined in chapter one subsection 1.5.

II. Environmental compliance

Broadly speaking the International association of Compliance (IAC) define compliance as the ability to act according to a set of regulations, orders or request. However, Parker and Nielsen (2011) describe environmental compliance as the manner in which an organisation responds to regulation, if the response is positive it is compliance and if it is negative then it is termed as non-compliance. Nonetheless, Environmental compliance is defined by Delfin (2013) as conforming to environmental laws and standards in order to promote a general consensus of beliefs and values. Environmental compliance involves businesses, state entities and even individuals (Delfin, 2013). According to Glazewski (2009) environmental compliance and enforcement are focused on ensuring the adherence to environmental legislature. For the purpose of this study environmental compliance is mentioned by NEMA (1998) as adhering to environmental laws, policies, regulations and standards.

There are various theories of compliance that attempt to explain what it entails. Some of these theories of compliance adopt approaches such as the managerial approach. According to Fitzmaurice (2018), this approach focuses on the notion that legal norms are not the only tool that can promote compliance however, it should be used together with the interaction between parties and compliance promotion.

III. Sustainability

Morelli (2011) states that various academics disagree as to what exactly the term sustainability entails and this has therefore produced several versions of its definition, evoking uncertainty. Furthermore Morelli (2011) states that this uncertainty with regards to its definitional parameters is attributed to varying philosophical and political perspectives (Morelli, 2011). A lack of a general consensus on what sustainability is about has led to much of the misuse of the term and the gaps in knowledge have facilitated the excuse for entities to simply avoid becoming sustainable. Nevertheless, Berry and Rondinelli (1998) define environmental sustainability as the need to protect the environment and conserve natural resources. On the other hand, Fraser (1997) mentions that it is economic development that does not compromise the integrity of the environment. However, from a pioneer of ecological sustainability Daley (1990), he states that environmental sustainability encompasses the rates of renewable resource harvest, production of pollution, and non-renewable resource

depletion that can be continued for an indefinite period. When it cannot be continued for an indefinite period then it is termed as 'unsustainable'.

Fraser (1997) debates this it is critical to note that globally environmental sustainability is known to incorporate elements. These elements include the management of oceans, freshwater systems, land as well as the atmosphere. This is done using sustainability principles. Moreover, Fakier et al. (2005) argue the world's definition of environmental sustainability is now encapsulated in the term 'sustainable development.' This definition entails sustaining the economy, society and the physical environment, in a way that does not compromise the potential for subsequent generations to do the same (Fakier et al., 2005). Morelli (2011) proposes that environmental sustainability is the preservation of natural capital. However, denote it as a conception that is detached from, yet connected to both social and economic sustainability. However, the plight is not wholly merely about the definitional parameters of sustainability, but the root problem lies in the components that make up sustainability science. It is regarded as strange to have sustainability viewed from a scientific lens while still possessing ethics. The ethics are perceived as being too vague and this inhibits its practice in the tangible world.

Along with the continual pursuit, to conceptualize sustainability followed the gradual emergence of sustainability models. There are two models or comprehensive approaches that speak to sustainability which are namely, the weak sustainability model— which is defined by Jenkins (2009) as disregarding particular obligations to sustain any good. Therefore, focusing on the aim to merely ensure that succeeding generations are not worse off than they were. Conversely, a strong sustainability model prioritizes the preservation of ecological goods, such as species or the functioning of particular ecosystems (Jenkins, 2009). Each view lends to either the ecocentric (Strong) or the anthropocentric (weak) stance in environmental ethics (Jenkins, 2009). Alternatively, sustainability can be viewed from either an economic, ecological or political lens as each key element wields a significant influence on how sustainability is defined. However, each element is dependent on the other. Sustainability encompasses a coalition of the economy and the politics, with substantial dependence on the physical environment for either of the other two to exist or operate.

Thiele (2013) brings to the table a wholesome definition which describes sustainability as a malleable component attached to science with the hopes of adding an ethical element to its progression, moreover it entails satisfying the needs of current generations without compromising or disadvantaging future generations. Thiele (2013) further emphasises that this can be accomplished by pursuing ecological health, economic welfare, social empowerment and cultural creativity. Therefore, this is the definition that was used in the dissertation.

2.3 Environmental Management and Compliance: A Global Perspective

It is argued by Soon et al. (1999) that increases in minor greenhouse gases has the ability to increase the overall surface and lower atmospheric temperatures, therefore contributing to general climate change globally. Khan (2017) argues that the earth is suffering greatly due to human activities, as these activities create an imbalance in the earth's naturally operating

systems. This is a phenomenon that has become increasingly difficult to dispute as much of the planet's resources are in jeopardy. Khan (2017) further mentions that greenhouse gases in particular are a great area of concern as human activities produce an excessive amount of greenhouse gases moreover, human activities are destroying natural carbon sinks such as forests and ocean plankton. Furthermore, the sources of these green house gases are increasingly becoming variable, as the there is pollution that is at source and also that is transferred from one point to the other.

According to Wolf and Menne (2007) the World Health Organization stipulate that an estimated 20% of deaths in Europe are attributed to environmental causes, therefore this has increased the prioritization of environmental management on the European agenda. This prioritization is a trend that has extended towards other continents such as South America, Africa and Asia too. Khan (2017) agrees with the idea of prioritizing environmental management as Khan (2017) believes that the rising human population and the need for natural resources is increasing the interactions that humans have with the natural environment, therefore creating a need for this interaction to be managed. However this management needs to be guided by a set of prinicples that can guide the creation of policies, laws and regulations that speak to environmental management.

The OECD (2008) and WHO (2008) have documented that transport for instance contributes significantly to environmental degradation as the emissions increases air pollution, climate change, noise disturbances and health risks but also contribute to social issues such as congested roads, and accidents that lead to death. However Khan (2017) believes that other human associated components such as the burning of fossil fuels, deforestation, and electrical appliances contribute to much of the experienced air pollution around the world, more especially in developed countries. This is a note worthy point of interogation as often than less it is believed that developing countries contribute greatly to greenhouse gases. Nevertheless, the OECD (2008), further stress the environmental impacts associated with transport are grievous, these include greenhouse gas emissions and climate change, reduced air quality, human health implications, ecosystems that are impacted due to infrastructure destroying habitats and soil.

The Swedish Environmental Protection Agency (SEPA) (2002) argue that transport is an activity that affects humans but also affects the natural environment. However, SEPA (2002) believes that regardless of the adverse effects transport has it is still vital for a functioning society and for mobility. Therefore, the OECD (2008) agrees with the important role that transport plays however they also believe that transport systems and land planning need to find innovative ways to mitigate if not reduce the environmental impacts associated with transport. Khan (2017) speak of environmental management being fully integrated in transport systems more especially due to the rapid increase in number of motor vehicles that are now being purchased and used.

The OECD (2008) and WHO (2000) mention that air pollution caused by transport is destroying human health and environmental health, as pollutants such as particulate matter, nitrogen oxides, sulphur oxide, ozone, and volatile organic compounds are being produced at an alarming rate by the transport industry. These pollutants are damaging biodiversity and ecosystems, as they create an increase in eutrophication and acidification due to the deposition of nitrogen oxides. Furthermore, according to the OECD (2008) it is documented

that the energy used from road transport in OECD countries has almost doubled between the years 1971 and 2000 and in non- OECD it is has almost tripled in the same time period. If this does not call for environmental management interventions then the planet is surely doomed. Furthermore SEPA (2002) argue that transport industry is very resource intensive as it requires the burning of fossil fuels, oil consumption, land and water and because of its transboundary component, it needs cooperative action from various stakeholders in society.

Fuggle (1990) states that environmental management is constantly evolving however the evolution was initiated in the first decade in the United States of America (USA), when the National Environmental Policy Act. Of 1970 was promulgated (NEPA). Ogola (2007) argues that NEPA was recognized as birthing the first tool for environmental management also referred to as the Environmental Impact Assessment (EIA). The principal aim of NEPA was to reinforce decision-making through the identification and investigation of the environmental repercussions of a proposed activity with the priority instrument for NEPA being the EIA (Fuggle, 1990; DEAT, 2004; Momtaz and Kabir, 2013).

Momtaz and Kabir (2013) argue that the reason why NEPA was crucial in the evolution of environmental management is embedded in the shift it represented; this shift was from an economic expansionist or one could say a capitalistic view of the world, where there was open frontiers and unlimited resources, to a more realistic view of the world where the supply of natural resources are finite. According to the DEAT (2004) this shift disintegrated the notion of a focus on technical engineering and the financial requirements of activities and propelled us to the recognition of consequences of human activities on the environment (Momtaz and Kabir, 2013).

Ogola (2007) further argues that during the first decade of the EIA's existence, various significant and practical methods were developed to assist in dealing with the identified complexity of environmental systems. The elements of the environment had to be grouped in discrete components to facilitate assessment of specific impacts such as for example that of soil, air and water (DEAT, 2004). Petts (2009) argues that even in current times, the EIA is an acclaimed tool, for being one of the world's most significant policy innovations of the 20th century that has provided us with the first widely applied environmental assessment and management tool.

The DEAT (2004) mention that the second decade was characterized with the social dimension of environmental assessment. This was crucial as the social impacts are also key to environmental mangement, as instances of environmental injustices have been intertwined in te lack of efficient identification and inspection of environmental impacts. To advance social and environmental equity according to Ogola (2007) in the 1980s the EIA process introduced the emphasis on effective stakeholder engagement in addition to that, conflict resolution. Associated with this addition was the identification and integration of social issues and societal values into the EIA (DEAT, 2004). Sadler (1996) mentions that historically, rapid technological advancement and economic growth created environmental problems in the USA, this pattern became evident in the western parts of the world too. Therefore, the 1980's further enabled methods such as scoping which facilitated identifying environmental issues with the EIA (DEAT, 2004; Petts, 2007). This was a huge step in the right direction for the environmental management community.

The DEAT (2004) argue that the third decade was characterized with the development of the concept of sustainable development which interestingly emerged in the course of the late 1980s to early 1990s there were two significant contributions to the sustainable development agenda. According to Keating (1992) this was firstly the publication of the 'Our Common Future' which highlighted the importance of decisive political action which was needed as the global environment was rapidly deteriorating. Secondly, the United Nations Conference on Environment and Development which is better known as the Rio Earth Summit which was held in the year 1992 (Keating, 1992). The DEAT (2004) argue that this shift towards addressing the lack of sustainable development allowed for progressive tools to be formulated such as Strategic Environment Assessment (SEA) which is termed as the inclusion of firstly, environmental considerations in the commencement of policies and secondly, Environmental justice (DEAT, 2004).

According to SEPA (2002), it is becoming increasingly important to engage with the environmental management of the transport industry as the environmental impacts associated with transport is of global concern especially in the rapidly urbanised times that we live in. According to Walsh (1999), China had the lowest density with regards to car ownership in the year 1999 in comparison to other countries such as the United States, Germany, Egypt, etc. however China also had the most rapid growth yearly, with this trend dominating particularly in cities. Walsh (1999) argue that this rapid growth contributed significantly to much of the air pollution experienced there. Moreover, Kebin and Chang (1999) argue that the total pollutant emitted from automobiles in cities in China in comparison to other industrialized countries is distressing, this steep pollution emission from transport was due to the lack of developed vehicle manufacturing technology in China, along with poor maintenance of vehicles. Therefore, Walsh (1999) and Yulin and Liguang (2006) defends the idea that China needs better policies in place to monitor the pollution created by transport, furthermore Kebin and Chang (1999) mention that policymakers in China shared the same sentiments as the air pollution levels due to transport along with the congestion were disturbing.

Zhang et al. (2008) argue that in the case of China, the Chinese government have attempted to allocate some of its attention towards environmental issues. Hayha (2014) claim that this is mainly due to China's population growth spurt coupled with its economic development. Moreover, China has ratified and has put into practice a string of principles, policies, and laws that date back to the 1980s (Zhang et al., 2008; Wang, 2010; Hayla, 2014). According to Zhang et al. (2008) these environmental policies when initiated were centred on the notion of a regulatory framework additionally this framework was useful not only in the sense that it successfully cleaned the country's land, air and water but also decreased further environmental deterioration.

Zhang et al. (2008) believe that the only problem with this environmental protection strategy was that it proved to have considerable public and private costs. Thus a recent shift away from this approach was welcomed. According to Wang (2010), the shift looked at moving away from policy discussion that focused on the narrow firm-state interaction as the sole indicator of environmental action. As reported by Zhang et al. (2008) the shift looked at moving towards alternative approaches such as financial incentives, business-led voluntary programs, public-private partnerships, information disclosure, and labelling. The shift would, therefore,

reduce the costs while still achieving the same if not better environmental objectives as the prior framework (Khan and Chang, 2018).

Recent evidence shows that although there have been some advancements with regards to reducing air pollution created by the transport industry in China, Walsh (1999) is in agreement with Zhang et al. (2008) with regards to incentivising individuals and entities in order for better environmental compliance to occur. Walsh (1999) further mentions that there also needs to be improved enforcement, as this will allow for the environmental management strategies in place to reduce the environmental impacts of the transport industry to be effective. Khan and Chang (2018) argue that much of the environmental issues evident in China are rooted in its industrialization however also in the lack of adequate environmental monitoring. Moreover, Wang (2010) and Khan and Chang (2018) argues that in China the main concern is economic growth while much of the environmental policy remains cumbersome to implement at a local level. Therefore, Khan and Chang (2018) argue that there needs to be a transformation in the relationship between, government markets, the state, society and the authorities that possess bureaucratic powers; as this will facilitate the improvement of how environmental policy is implemented.

According to Wang (2010), there have been significant contributions to environmental compliance such as the reorganization of institutional frameworks, and the introduction of the State Environmental Protection Agency in China. Furthermore, the OECD (2006) mention that environmental compliance assurance and enforcement have become focal areas for the Chinese. According to Zhang et al. (2008), the Chinese environmental regulatory system expanded rapidly between the years 2000 and 2004. This period was when a number of newly developed environmental laws were enacted, for instance, the Law on Environmental Impact Assessments (EIA) along with the Law on Cleaner Production (OECD, 2006). According to Wang (2010) at that same time accompanying legal acts were also amended such as the Environmental Protection Law (EPL) along with the Air, Water and Waste Prevention and Control Act.

Based on the evidence brought forward by Michalak and Mazur (2008), China has also recently created regional enforcement centres, this was mostly because the country realised that majority of the environmental issues that they were facing were associated with the lack of adequate enforcement. Furthermore, the OECD (2006) have reported that there has been an introduction of public participation in non-compliance detection; however, the environmental management system and implementation are still drastically lacking in efficiency and effectiveness.

According to the Environmental Protection Agency (EPA) (2016) an environmental management system (EMS) is described as a set of processes and practices that facilitate the ability for an organization or entity to minimize the impact is has on the environment. Additionally, according to Sheldon and Yoxon (2006), the EMS helps to improve the organization's operating efficiency. This is crucial in the aims to efficient environmental management. Sheldon and Yoxon (2006) further argues that the EMS framework promotes attaining environmental goals through rigorous review, evaluation and the improvement of the organization's environmental performance. However, the EPA (2016) mention that it is useful to note that an EMS does not necessarily speak to nor dictate the level of environmental performance of the organization, it is the organization that decides its desired targets and

objectives for the EMS. This inadequacy gives room for organizations to decide what their environmental performance should look like, and this does not always fall in line with general environmental management goals set by the state.

According to Gerardu et al. (2015), environmental compliance is of significant importance in the practical sphere of environmental protection and effective management. On an international scale, a significant contributor to the notion of environmental compliance is the International Network for Environmental Compliance and Enforcement (INECE). Moreover, the INECE boasts 25 years of contribution to the environmental compliance community. It was initiated in 1989 as a result of an exchange between the Netherlands and the United States of America's EPA. This was a possible attempt at an international collaboration targeting expertise in international and national compliance with environmental laws, standards, and norms (Gerardu et al. 2015). The INECE may be reasonably considered as a key contributor to environmental compliance in the developed countries. However, in the African context, there is still much to be desired regarding the minimal contribution this organization has made. This merely falls in line with the fundamental idea that there is a distinct need for African countries to successfully develop environmental institutions that are perchance of a transboundary nature.

As stated by Mothe at al. (2014) in Brazil much of the transport network is on clogged roads. This, in turn, results in substantial congestion on roads in large urban areas moreover significant air pollution. Mothe et al. (2014) report that in the June 2013 massive protests sparked in Sao Paulo. This was due to the saturation of public transportation, the rise in ticket sales and the deteriorating air quality in these urban areas. Therefore, these protests highlighted that in developing countries there is a dire need for the improvement of public transport systems and that the demand does not fulfill the supply. Nevertheless, according to Malvestio et al. (2018) because of this considerable uproar from the local community, Brazil has implemented some environmental management strategies. One of these strategies is the standards for vehicle emissions, which includes the Air Pollution Control Program for vehicles and the climate change policy in Sao Paulo. Furthermore, Malvestio, al. (2018), argue that there needs to be the inclusion of sustainability principles into transport decision-making of sustainability principals which implies a thorough change in the way that transport is viewed in a country such as Brazil.

According to Gerardu et al. (2015) international efforts such as cooperative work to deal with environmental compliance are also evident, one example of this is the formation of the International Network for Environmental Compliance and Enforcement (INECE). This was birthed through the Organisation for Economic Cooperation and Development's (OECD) research project on compliance monitoring and enforcement. Secondly, the bilateral agreement between the Netherlands Ministry of the environment and the United States of America Environmental Protection Agency in the form of a memorandum of understanding (Gerardu et al., 2015). The INECE has become the leader in trans-governmental networks that respond to global challenges through efficient information exchange and collaboration between officials (Gerardu et al., 2015). Furthermore, multilateral environmental agreements that were made required adequate compliance as they were targeted at protecting the environment and protecting human health (Gerardu et al., 2015).

During a study conducted by Gerardu et al. (2015) in some countries, questions that were raised regarding compliance were centred on aspects such as what behavioural, technical and legal components of the system are affecting compliance levels? How exactly can we modify them to enhance compliance? Moreover, what new technologies and analytical capabilities could aid us in making better use of the approaches that are currently available? These are all valuable questions that are key to understanding the intricacies of environmental non-compliance. Gerardu et al. (2015) documented some key findings from the INECE, these contained aspects such as the historic regulatory design and therefore emphasised pivotal elements of environmental law systems and schemes. Furthermore, specifically highlighted the crucial role of competent legal authorities who may support government environmental enforcement programs (Gerardu et al., 2015).

2.4 Environmental Management and Compliance: A Sub-Saharan African Context

According to Sharma and Kumar (2012), transport and the environment are two contradictory components. As transport is essential for a thriving society yet it is also the cause of the destruction of the environment where society is built on and is dependent on. Furthermore, it is believed that many developing countries are plagued with the issue of transport policy needs alongside environmental protection needs (Sharma and Kumar, 2012).

As stated by Failler et al. (2016), Kenya is plagued with environmental issues such as the high levels of motor vehicles on the roads which is, therefore, creating significant amounts of greenhouse gas emissions and air pollution. Failler et al. (2016) argue that this air pollution is contributing to climate change and the experienced increased floods and droughts occurring in this semi-arid country. Furthermore, Failler et al. (2016) is of the view that there needs to be an intensification of environmental management enforcement and a regulatory institute which can encourage institutes to manage the waste that they produce, and the effects that they have on the environment.

Raje et al. (2018) argue that in Kenya the City of Nairobi suffers from traffic pollution, it is believed that traffic congestion has drastically contributed to the poor air quality in Nairobi, much like other large cities of the world. Furthermore, it is argued by Raje et al. (2018) that if the congestion is decreased this could be of significant benefit to the air pollution levels in the city, therefore there is a need for innovative solutions to the traffic congestion in Nairobi. These solutions may include infrastrustructure, policy, and regulatory frameworks that may encourage the reduction of traffic congestion and in turn the reduction of traffic air pollution in the city (Raje et al., 2018). This will not only benefit the members of the community but will also protect the environment. In turn, this feeds back into the notion that environmental sustainability is ensuring that the environment which is a shared resource that needs to be used responsibly.

According to The Ministry of Environment, Water and Natural Resources (MEWN) (2013), the Kenyan government is responsible for the creation of compliance with environmental requirements or legislature. The policy statement stipulates that the government should design and implement an environmental compliance and enforcement programme and

increase public-private participation in environmental management (MEWN, 2013). It is noted according to MEWN (2013) that compliance which is voluntary is far less costly to the state, but due to the lack thereof enforcement measures are needed to enforce and promote legal requirements. Moreover the compliance needs to be done in a timely fashion, of which environmental compliance monitoring is of significant importance.

According to Adebayo et al. (2015), policy and law make environmental protection possible furthermore, it is the responsibility of government to make policies that are supported by laws which in turn accomplishes environmental compliance. According to Adebayo et al. (2015) environmental compliance entails adhering to environmental laws, treaties, statute, conventions, regulations and common laws – in order to manage the interaction that humans have with the biophysical environment or natural environment. Moreover, Adebayo et al. 2015 are of the view that in Nigeria the establishment of the National Environmental Standards and Regulatory Enforcement Agency (NESREA) was nestled in need to review and development of current environmental rules and regulations in Nigeria. It was evident that there needed to be a pollution control strategy that would have policy and laws in place to mitigate the environmental effects the pollution produced the country.

Adebayo et al. (2015) are of the view that the lack of knowledge regarding pollution and land degradation along with poverty have been significant contributors to the deteriorating state of the environment in Nigeria. Furthermore the lack of efficient enforcement of environmental laws proves to hurt the environment. Adebayo et al. (2015) states that a crucial problem in Nigeria is the isolation of environmental laws. This too is evident in South Africa as much of the environmental laws seem to be detached from actual implementation and institutionalization.

Agbazue et al. (2017) state that much of the environmental laws in Nigeria can be categorized as either pre-1988 or post 1988, in the year 1990 there was the most significant changes to the environmental legislation in Nigeria. This was associated with the various treaties and conventions that they became signatories too. Adebayo et al. (2015) mention that some of the environmental laws that were created are the Environmental Impact Act 1992, harmful waste Act, and the Environmental Sanitation Act amongst others. Agbazue et al. (2017) argue that the formation of NESREA was rooted in the notion of promoting an environmental regulatory system. Its main focus was to ensure the protection of the environment, the enforcement of environmental laws and regulations, the creation of environmental awareness, and to engage with the idea of partnering with the community to increase the protection of the environment. Schmitz et al. (2010) is of the view that the evolution of the study of the environment has moved from it being scientific in nature, to the involvement of technology and now the examination of the pivotal role of human relationships and engagements. The role that the community plays is largely underestimated, when in actual fact they are the agents that can encourage or discourage environmental sustainability.

2.4 Environmental Management and Compliance: A South African Context

According to the Department of Transport (DoT) (2014), the measurements from the Greenhouse gas emissions inventory of South Africa from the year 2000 to 2010 proved that

road transport contributed 91.2% of GHG emissions. Furthermore it is argued by the DoT (2014) that the transport sector has a significant carbon footprint and contributes significantly to the country's overall GHG emissions. The DoT (2014) mention that efforts to reduce the production of GHG emissions from the transport sector include the Green Transport Strategy which is designed to reduce the negative environmental impacts associated with the transport industry, over a five-year period.

The DEAT (2004) argue that in the western parts of the world EIA's were birthed due to pressure from the population, highlighting a bottom-up approach which worked well in those parts. Unfortunately, in South Africa and many other developing countries, they adopted a more top-down approach where the EIA tool as a requirement was institutionalised in national policy, international policies of funding by agents such as the World Bank, and international demands to respond to environmental issues (DEAT, 2004). Momtaz and Kabir, (2013) claim that this, in turn, led to resistance and negative attitudes towards the acceptance of these tools, furthermore there is a misconception that the tool is a developmental hurdle or blockage. Moreover, the DEAT (2004) argue that the World Summit on Sustainable Development (WSSD) that was held in South Africa – Johannesburg, in the year 2002 formally recognized the crucial role of environmental assessment in sustainable development.

There is very little research that speaks directly to environmental compliance and sustainability, but rather environmental management as a whole. However, Middleton et al. (2011) argue that in South Africa environmental management which is crucial to environmental governance is plagued with the fragmented state of the legislative framework (of which this thesis will engage with). Moreover this fragmentation is accompanied by a lack of coherent, specific roles and responsibilities in the three spheres of the government (Middleton et al., 2011). However, according to NEMA (1998) and Middleton et al. (2011), it is without a doubt that local government plays a pivotal role in the protection of the environment through its management. This is not merely because the constitution propels this as a right to citizens but also because they aim to attain sustainable development as a whole (Middleton et al., 2011).

According to the DEAT (2004) efforts to address the issue of environmental degradation include the amendment of National Environmental Management Act (NEMA) Act 107 of 1998 in the year 2010, by creating the Environmental Management Inspectorate (EMI). This legislative adjustment created a platform for environmental compliance and enforcement in the country. Furthermore, the DEAT (2008) mention that South Africa has an Integrated Environmental Management (IEM) approach that it has adopted. From a definitional perspective The Department of Environmental Affairs and Tourism (2004) state that IEM provides a comprehensive framework that may be adopted by various sectors of society for the assessment and management of environmental impacts and elements related to each stage of the activity life cycle. Moreover, IEM takes into account the wide-ranging definition of the environment and its aim to promote sustainable development throughout.

The publication of the document entitled 'Integrated Environmental Management in South Africa' conscientised the state regarding environmental sustainability, and made the concept of IEM significant to South Africa (DEAT, 2004). IEM was the chosen approach as it allowed for the integration of environmental considerations throughout all the stages of the planning, and development cycle and became applicable to various policies, programmes, plans and

projects (DEAT, 2004). The IEM was grounded on the notion that the EIA had shortfalls that hindered the advancement of environmental management in South Africa. These were namely the idea that the EIA propagated the notion of being anti-developmental; it came with various legal conflicts and the challenging nature of the tool in its implementation (DEAT, 2004).

In the first instance, IEM in South Africa was affiliated with authorisations of activities that were of a controlled nature such as mining or manufacturing. Fortunately, the evolution of IEM allowed for a paradigm shift that is based on a wide-encompassing perspective that brings a sustainable element into the environmental management space. This perspective highlights IEM as an underlying philosophy and set of tools that can be incorporated by all sectors of society for decision-making purposes for example government, the private sector and civil society (DEAT, 2004). This is a perspective that is of importance in efforts to advance environmental management.

Like China, countries which are often also of a developing nature such as South Africa are also at their wits with regards to environmental compliance. According to NEMA Ac 107, 1998) the environmental management Act 107 of 1998 has the purpose of providing certain aspects regarding the administration and the enforcement of environmental legislation. Section 16 of the NEMA Act (1998) has the provisions for environmental compliance with environmental management plans, whereby organs are obliged to adhere to the conditions set in their EMPs and to submit these plans to the director general and the committee annually. Based on this legislative requirement and the environmental crimes evident in South Africa, there is a clear indication of the importance of environmental management plans. They are moreover considering that a country such as South Africa is characterised with a discriminatory and exploitative background that has facilitated the space for an issue such as environmental injustice and a call for the conservation of the natural environment and its species.

2.5 Gaps in Literature

Environmental sustainability is argued eloquently by various academics. However, what plagues the concept of sustainability is the considerable uncertainty that the term undoubtedly has in the scientific field. Nelson and Vucetich (2012) are of the view that without a significant emphasis on the ethical component of sustainability in its standard definition there will inevitably be potential confusion regarding the specific role of science in sustainability. Very minimal literature speaks to this critic and therefore much of the conceptualization of the term is very broad and confabulating. Moreover, Schmitz et al. (2010) argue that environmental sustainability has become a key connection for various disciplines looking to study issues of resource allocation, poverty, social justice and Globalization. However, the main emphasis should be on the idea that environmental sustainability is about reconciling consumption and production patterns. This agenda requires the collective action of environmental standards, laws and policies and how they are complied with. One could argue that the crux of the issue may lie in the formulation of the environmental standards, laws and policies.

Having looked at the relevant literature, a lingering critic is the existing drawback of some environmental standards. Some environmental standards and regulations are flimsy in the sense that, it could be approved through the promise to improve, without actual proof of doing so. This is a gap that is associated to the lack of effective environmental enforcement and compliance. According to Edo (2012) non-compliance to environmental laws, regulations and standards are still very high in many developing countries. It is argued that this is due to the notion that the laws are contextually irrelevant (EC, 2018). Furthermore, smaller companies find the cost of environmental compliance to be problematic due to its complexity and too much of an economic strain or economically unsustainable (Carlough, 2004; INECE, 2018). An example of this is the EMA's standards which is regarded as having a vague auditing criteria, it costs too much, and interrupts the organisation's activities completely (INECE, 2018). These are issues noted in the literature, but a key critique which is interesting to note is the fact that there are not enough efforts done in the environmental management research sphere to investigate ways to enhance environmental compliance as also noted by Edo (2012).

There are very few innovative standards being researched which could possibly address the above concerns and sufficiently promote environmental sustainability. The idea that is highlighted in the literature is the notion that there is a lack of fluidity between the environmental legislative frameworks and the practices associated with it, consequently affecting the compliance too. The question that arises from this is how do we make compliance long-lasting or even relevant to the targeted individuals? Some may recommend the development of tools that are more progressive, less resource intensive, more technologically advanced and less taxing on those complying (Gerardu et al. 2015) however it is also essential to keep in mind the significant role that the public can play in environmental compliance and sustainability.

On the other hand, some suggest that heavier fines and legislature adherence would be the best means of enforcing compliance as this is a means of enforcement that negates the monetary benefits of non-compliance (INECE, 2009). This form of enforcement is encouraged as it creates fairness whereby compliant entities are not disadvantaged from the non-compliant ones (Carlough, 2004). Unfortunately, environmental laws and regulations cannot exist in isolation because the key lies in a more cohesive governance strategy, more resource investments, and consultations with appropriate target groups such as the entities that are required to comply and the host communities (EC, 2018). There is a need for an integrated environmental management approach that looks at not just the need to comply but a social contribution where the culture around environmental sustainability is encouraged amongst citizens. The raised environmental awareness through education and ultimately citizen participatory action could be a possible platform for environmental compliance and enforcement (INECE, 2009).

There is a significant fragmentation in the institutional frameworks that exist in the environmental management sphere especially in South Africa (Du toit, 2016), and this fragmentation facilitates the increase in non-compliance. Moreover, the lack of efficient emphasis in countries such as China for example on the environmental sector promotes the lack of respect towards environmental legislature. The studies and literature mentioned are indicative of the idea that environmental laws exist almost all over the world. However, they do not give adequate support as to how do we ensure that accountability is projected and laws are taken seriously. The lack of resource input in the environmental sector is astonishing,

more especially in developing countries. The problem also lies within the idea of 'what morals are suggested to the public', a conservationist agenda needs to be pushed. Additionally, there needs to be a means of ensuring compliance, be it through better training of environmental officers, joint efforts with policing structures, and an institutional reorganization.

Literature indicates that international efforts regarding environmental compliance are evident, such as the Kyoto protocol and the carbon emission targets (UNFCC, 2019), but unfortunately, the lack of adherence has been often associated with the subjectivity regarding the creation of these laws. Many lack a contextual basis thus compliance is fruitless in some countries. Hence, the problem is not just the lack thereof laws in some instances, however, more especially the weak execution and the implementation of these laws as also noted by Edo (2012). The prioritization of environmental management should be high on the government's agenda as the environment is the source of various primary resources utilized all over the world.

Furthermore, various ecosystem services of which much of society is built on depends on a healthy environment, this rhetoric seeps into not just the local society but the global society too. In developing countries, there is a necessity for the promotion of political will and collaboration as depicted in the case study on compliance in the United States of America and the Netherlands. Thus, the question is how does one enhance environmental compliance to assist in the management of the environment in the South African Context? Considering that very little research around environmental compliance and sustainability, there needs to be more academics and researchers that look at the value environmental compliance could add to the environmental management space.

Generally, in the field of environmental management in South Africa there has been very little focus on the intricacies of environmental compliance. Moreover, the roles that it has on environmental sustainability. This trend is evident in the global context too. It is documented that much of the research that exists is centred on the global efforts to ensure environmental compliance but even so these kinds of research have been focused on the developed states a have had a political agenda attached to it. Very few researchers in South Africa have engaged with the systematic inadequacies of environmental compliance. There is a general knowledge gap with regards to environmental compliance. What is not yet clear is the impact that environmental non-compliance has on environmental sustainability on a local, regional and global level. There is very little that is known about the effectiveness of environmental compliance in the promotion of environmental sustainability in South Africa. There is a large focus on the articulation of the laws and policies that govern environmental management, however how to ensure that entities comply with these is left to the imagination. Therefore, the hope for this research is to contribute to the body of knowledge that will eradicate this knowledge gap that currently exists.

Chapter Three:

Methodological Considerations

3.1 Introduction

The research methodology by definition is the systematic, theoretical analysis of the methods employed in a field of study (Chinelo, 2016). One should note that unlike methods which are used to find the solution, methodology outlines the theoretical underpinnings that account for the methods used (Chinelo, 2016). Therefore, this chapter covers the philosophical stance, research design, Description of sources of research material, study population and sampling method, Data collection tools and methodological reflections. These mentioned elements aided in highlighting the boundaries of reasoning and the grounds that formulated the perceptions for this study.

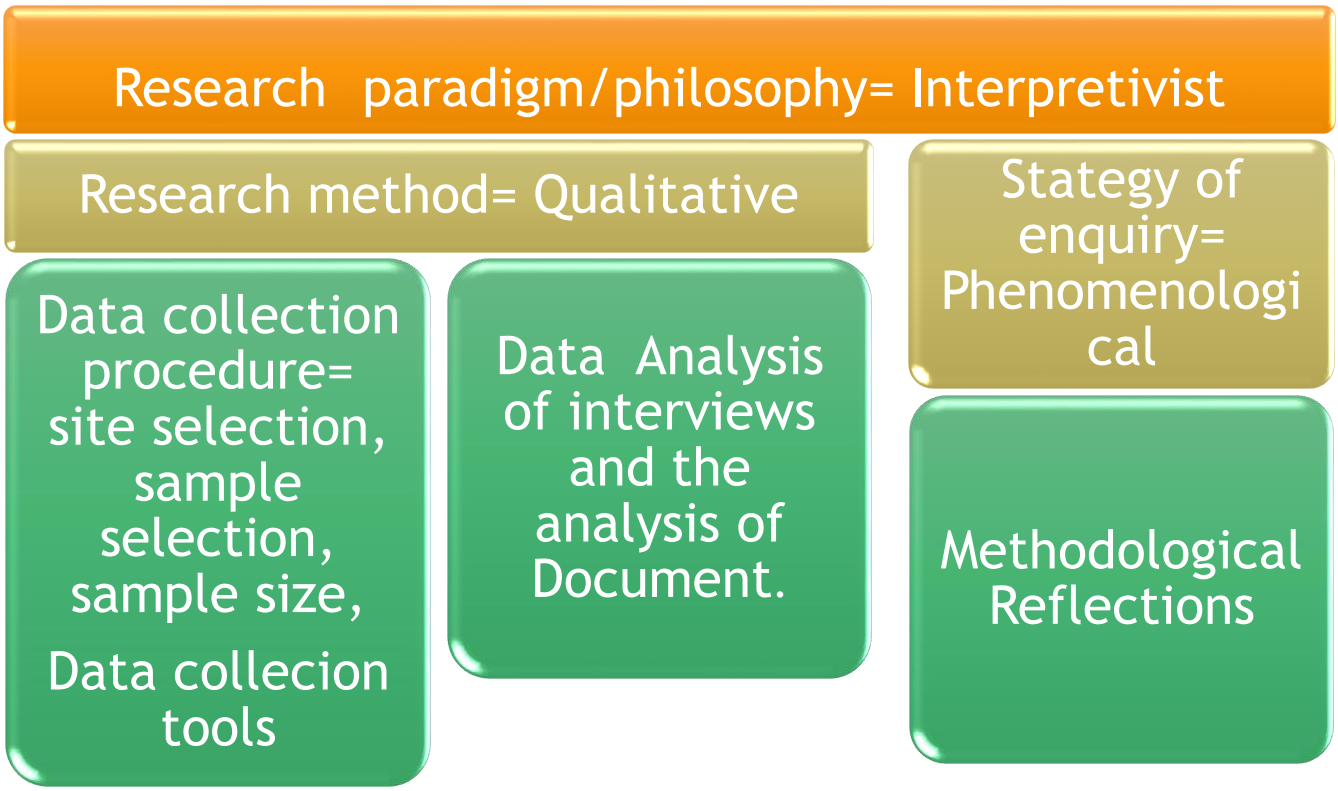


Figure 3.1: Summary of Chapter 3.

3.2 Research philosophy

This portion of the thesis is dedicated to discussing the research philosophy of the study (Chinele, 2016). Research has been described as a process of discovery and enquiry through asking the relevant questions about the topic of interest as well as finding a structured means of answering these same questions. Therefore, when localising research to the geographical

sphere components such as place, space, people and the environment become pivotal (Kitchin and Tate, 2000). Research of this nature could have been observed or conducted using various perspectives or theoretical perspectives, for example, positivism, realism, or even feminism.

Therefore, after thoroughly engaging with literature in the literature review along with particular readings on different methodologies the Interpretative approach was selected as the research philosophy. By definition, this philosophical approach is one that seeks to understand the context in which research is conducted (Thahn and Thahn, 2015). This approach is qualitative more than it is quantitative in nature. The Interpretivist approach relies largely on naturalistic and inductive methods such as interviews and analysing existing text, 2006) of which this research will employ. The interpretivist philosophical approach emerged as a critique of the positivist approach which focused on the quantitative element of research and negated the notion that value can be added to research (Cohen, 2000). Furthermore, the Interpretivist approach also has relativist ontology which has the assumption that reality, as it is presented to us is a construction that is inter-subjective. Moreover, Cohen (2000) argues that this construction occurs through meanings and understandings that are social and subjective.

The Interpretive approach draws its philosophical underpinnings from hermeneutics, which is a school of thought or knowledge that focuses on the meaning of words or literature (Barret et al., 2011) and phenomenology which according to Lester (1999) is an approach that focuses on the specifics and to identify phenomena according to how the actors experience it or perceive it in the situation. Phenomenology is argued by Lester (1999) to be of great value as it unearths experiences and perceptions of the participants, therefore allowing the researcher to challenge pre-existing conceptions, and structural and normative assumptions. Therefore, Interpretivism highlights that meanings are attained from the research process and all interpretations are based on a particular context or situation and time (Cohen, 2000; Dean, 2018). Additionally, the approach has a subjectivist epistemology that has the assumption that one cannot separate themselves from what they know therefore the object of investigation and the investigator are inseparable (Cohen, 2000).

According to Dean (2018), interpretivism has an ontology that views the world as being subjective, socially constructed and multiple furthermore, in terms of its epistemology- which is the knowing of the subject, it has an epistemology that has the assumption that data may not be removed or collected from the subject as this negates the construction or discovery of that knowledge. This is exceptionally contrary to an approach such as for instance positivism which focuses on measuring and quantifying phenomena as to create a cause and effect relationship (Lester, 1999). The Interpretivist approach also encourages the use of multiple methods in order to highlight different aspects of the issue being investigated.

The study, therefore, focused on this approach as it aided in finding out if environmental compliance methods were efficient in South Africa's transportation industry. This approach was most useful for this research as we did not seek to just get statistical data on how well or how many companies comply to the environmental legislation in order to promote environmental sustainability as positivist study would have. However, what we seek to know is what the contributing factors to the quantitative data available are. This was done by analysing the lived experiences of the relevant stakeholders that engage with environmental management and compliance, this included state representatives that deal with

environmental management, environmental managers and environmental consultants from the private sector.

Therefore, interpretations based on the specific time, context and situation aided us in inferring what avenues can be suggested to aid in the promotion of environmental sustainability in the not just the city of Johannesburg but the Republic of South Africa too. This Interpretivist approach which uses methods such as interviews, focus group discussions, and observations- for the purpose of this study we used interviews (Dean, 2018) which allowed for the selection of data that allowed the researcher to understand the contributing factors that affect the level of environmental compliance in the public transport sector in the City of Johannesburg. This study took the position that the issue of adherence to environmental compliance in environmental management is an issue that needed to be investigated in depth.

3.3 Research Design

The research design involves the step by step process of what was done during the study. It was essential that the study highlights the importance of environmental compliance as an avenue for environmental management and environmental sustainability in South Africa. This was done by firstly creating research questions and aims to guide the study, these are noted in chapter one. Then an indepth literary review of the existing knowledge regarding environmental mangement and compliance, and the detrimental effects of the transport industry on the biophysical environment, in different contexts was done (as seen in chapter 2). Furthermore a research approach/ philosophy was indentified to guide these methods used to gather and interpret the data.

The approach used in this study is the interpretivist approach. This approach is associated with various research frameworks such as phenomenology. A Framework is briefly defined as a set of broad concepts that guide the research (Willis, 2007). The Interpretivist approach is guided by a research framework where subjectivity and the search for meaning are focal. There are some key principles that are crucial and these are noted by Saunders et al. (2012) as the principle of contextualization, the principle of interaction between the researcher and the subject, the principle of abstraction and generalization, and the principle of multiple interpretations. Interpretivist research often uses methods of inquiry such as interviews and observations (Willis, 2007). The method associated with the approach that was utilized in the study is that of semi-structured interviews.

The study was interested in understanding what the individuals think and do and what are the problems that they encounter and how do they deal with them. This is the type of information that the Interpretivist research approach can help one deduce (Saunders et al., 2012). Furthermore, the core interest of the study was to identify what is specific, unique and irregular in environmental compliance in the South African Context. The research design used for this study is an exploratory one. Exploratory research is essentially qualitative in nature and focuses on understanding the underlying reasons, opinions, and motivations of a phenomenon (Willis, 2007). This essentially means that the aim is to better understand the

issue of environmental compliance in South Africa as there is very little that is understood regarding environmental compliance and environmental sustainability.

This dissertation has an exploratory research design which includes two types of data collection these are namely primary and secondary. Primary data are collected and produced by the researcher with the sole purpose of addressing the research questions (Willis, 2007). The primary data for this study was in the form of interviews that were conducted (these are further elaborated on later in the chapter) with the relevant environmental practitioners. Secondary data is known as the collection of data that already exists, therefore document analysis of pre-existing literature and publications supported the primary data that was collected. Qualitative research methods are used in exploratory research designs. These methods are focused on gaining insight through the collection of data from a relatively small number of respondents in comparison to quantitative research methods (Stebbins, 2001).

It is argued by Stebbins (2001) that interviews are a very useful tool for exploratory research but are also used in descriptive research. These interviews allowed for us to see how for instance political influences can affect how environmental compliance is manifested in South Africa and how certain attitudes and experiences developed can be attributed to aspects such as adherence to legislature. This insight served to be very meaningful for a study of this calibre as the data collected through the interviews allowed for a deeper understanding of the policies and practices that affect the efficient management of the environment and the lack of education sometimes affects how environmental management tools are dealt with or even understood.

Research studies often need to have a research site. The research site was not specifically identified but individuals that were gate keepers were identified and they then facilitated the snowball sampling process as mentioned in the remainder of this chapter. The focus area was Johannesburg because of its unique population density and the high demand of transport in this region thus having a significant carbon footprint and contribution to GHG emissions through the transport industry. To ensure the study was feasible with the time frame provided, we limited our study to the Rea Vaya BRT and the municipality of the city of Johannesburg.

The interviews were conducted with the relevant stakeholders as seen in the attachment in the appendix and the data obtained from these interviews was stored in the form of audio recordings and it was later transcribed and stored securely for data analysis. These interviews were 45 minutes each and required in depth engagement with the participants. The interviewees were kept anonymous to ensure their safety and comfortability with participating in the study. The interviews were conducted over a month a half in order to alow sufficient time to transcribe them and do the necessary data analysis.

Moroever, the method that coupled the interviews was that of document analysis. This method was selected to add some theoretical data in support of the interviews conducted with the participants. The documents were searched and read over a period of three months

and grouped according to the relevent research questions as stipultaed in table 3.1. below. The data was presented in chapter four where we have linked the data collected with the research questions expressed in chapter one.

There after the process of data analysis was done with both the interviews and the documents. The method of data analysis that was employed in the study for the interviews was that of thematic analysis, this method is further elaborated on in chapter three of the dissertation. Document analysis was done and paricular themes that resonated with the research aims and objectives were identified and recorded in the dissertation. This is elaborated on in chapter five. Finally, we made conclusions on the epirical evidence documented in chapter 5, we drew out some key findings and made some recommendations based on these findings.

Table 3.1: Table of the methods used to answer the research questions

Research Question		Method used
1	What institutional frameworks exist within environmental compliance?	• Interview • Document analysis
2	What legal frameworks exist that speak to environmental compliance?	• Interview • Document analysis
3	What are the social and environmental repercussions of the lack adherence to environmental compliance?	• Interview
4	In what ways can environmental compliance be used as a tool to promote environmental sustainability.	• Interview • Document analysis

3.3.1 Research Site/Description of Source of Research

3.3.1.1 Location of study area

The study area is located in the heart of the Republic of South Africa, in the city of Johannesburg municipality. Johannesburg as a city is the largest in the Republic of South Africa and is located on the north central Highveld of the country. It has the fasted growing city population resulting in the sprawling of suburbs, which cover 1100 square kilometres of land. The city of Johannesburg is found in the Gauteng province.



Figure 3.2: Map of Gauteng and Johannesburg (Source: https://www.places.co.za/html/gauteng_map.html)

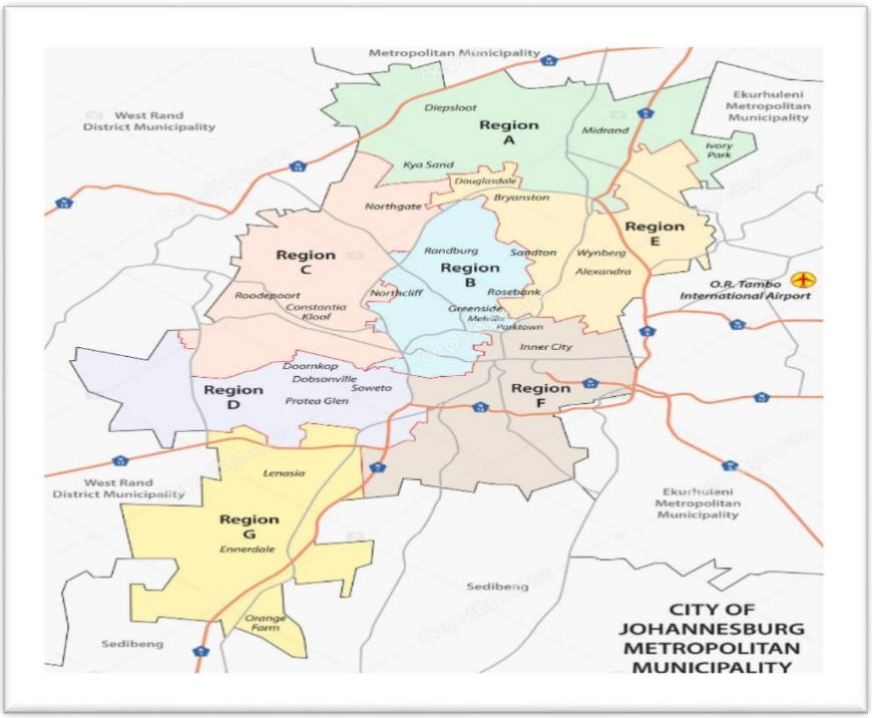


Figure 3.3: Map of the City of Johannesburg Municipality, the study area (Source: https://depositphotos.com/183115804/stock-illustration-city-johannesburg-metropolitan-municipality-

Another source of research was that of documents that were analysed. These documents are described in the subsections that follow in this chapter. These are of specific focus on South Africa and the city of Johannesburg municipality as that is the focus of the study.

3.3.1.2 The Importance of the study area

The Gauteng province is commonly known as the economic hub of the country and this status has led to various large transnational companies' headquarters being found there. There is a huge influx of rural-urban migration in the City of Johannesburg that has led to a strain on the currently available resources and a somewhat exorbitant lifestyle. The industrial nature of the city dates back to as far as the late 19th century when it became established as a mining and commerce town. This status led to an influx of rural-urban migration and rapid population growth that was experienced then and is still being experienced currently (City of Johannesburg, 2018).

The current mode of transportation is that of motor vehicles, but there is also an increased interest in public transportation in the city of Johannesburg for environmental reasons but also to ease the congestion on the roads. The current transportation systems include the Reya Vaya bus system, the Metro bus system, minibus taxi, metro rail railway system and the Gautrain rapid railway system. Thus the research was centred on the notion that the transport industry has a significant impact on the natural environment and the social environment too. Moreover, Johannesburg has a high population density that contributes to and depends on the transport industry consequently environmental issues such as air quality, water quality, and biodiversity become of particular interest.

The Rea Vaya BRT was chosen as the focus of the study because it is a project that personally resonated with me as the researcher as I occasionally use it from the North Western part of Johannesburg to get to the university which is in the central region of Johannesburg. Furthermore, the Rea Vaya BRT was introduced as part of the strategic plans to make the City of Johannesburg a greener and environmentally conscious city (COJ, 2018), moreover, it was a transport system that was feasible to research due to its geographical limitations.

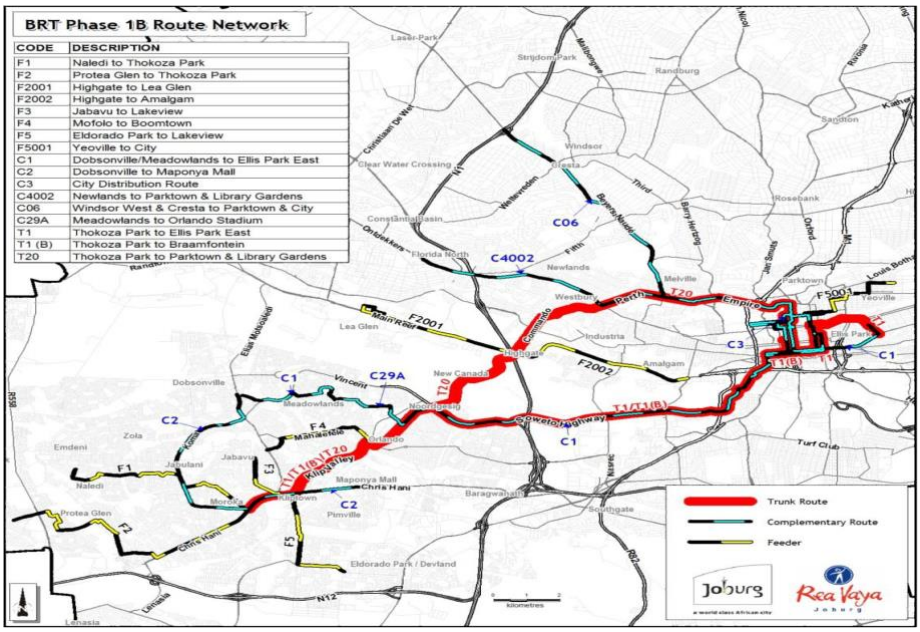


figure 3.4: Map of the routes the Rea Vaya takes in Johannesburg (Source: REA Vaya)

3.3.2 Study population and Sampling Process

3.3.2.1 Study population

The population is inclusive of all the elements that conform to the criteria of inclusion in the study (Kitchin and Tate, 2000). Therefore, for the purpose of this study the population was inclusive of all the compliance officials that overlook or monitor the compliance procedure after the EIA's have been conducted, in the transport industry. These were then narrowed down to those that have any association with or possess knowledge regarding the environmental compliance of the Rea Vaya Rapid Railway system or simply the transport industry. Getting an exact number for this target population proved to be quite troublesome as many environmental compliance officers specialize in the mining sector or waste and have very little experience in the transport industry. Therefore, the target group and the sample population were interchangeable.

3.3.2.2 Sampling Process

The process of sampling is described as the process of selecting a portion of the population that is representative in order to establish characteristics of the higher population (Gentles et al., 2015). The sample group is denoted as the subgroup selected from the greater population. The sample population is obtained from the target population of which we have identified in the previous section. This target population is the group to which we aim to generalize the study's findings.

Within the Rea Vaya BRT there were various employees that oversee various components associated with the project, however because the project is a state-affiliated it involves the city of Johannesburg and the provincial institute Gauteng Department of Agriculture and Rural Development (GDARD). GDARD oversee the developmental process and oversee the environmental implications that may be associated prior to the operational stage but also during the operational phase. Therefore, we were directed to the CoJ to get direction on who was and is involved with the project's environmental aspects.

According to Dean (2018) and Kitchin and Tate (2002) qualitative studies have been documented as generally having a smaller sample size, in comparison to quantitative studies (Kitchin and Tate, 2000). Crouch and McKenzie (2006) highlight an important aspect of qualitative research which is that it is not concerned with general hypothesis testing but is rather concerned with meaning. Therefore, in this study, 20 individuals were interviewed so as to get wholesome data from the sessions and for data saturation to be achieved. Data saturation occurs when there is no longer any new information or themes that are emerging from the data retrieved from the sample group (Saunders et al., 2018). The reason why there were 20 individuals interviewed was because while identifying the target group came to the realization that there are very few environmental compliance officials in South Africa that speak to the transport industry. This is speculated as being a result of the lack of development in the understanding of the environmental implications that the transport industry has on environmental sustainability. Furthermore, after having interviewed the 20 individuals it was

noted that there was no longer any new information being brought forward and data saturation had been somewhat achieved.

The 20 participants that were used in the study were selected using purposeful sampling or also known as snowball sampling or chain sampling (Kitchin and Tate, 2000). This is a method of sampling where preliminary work is done to identify potential individuals that are probable to have a viewpoint regarding the research topic. This preliminary work included the identification of gatekeepers who were starting points or also known as sample seed diversity (Kirchherr et al., 2018) and had knowledge about the individuals that we could approach for the study. Nevertheless, once they had been interviewed they were asked for names of other stakeholders that may also be spoken too or approached for the study. This process was repeated each time an individual was interviewed. One should take note that purposeful sampling is not probability based and does not allow the researcher to make inferences regarding what the population accept as true (Kitchin and Tate, 2000). It is rather a process that directs the researcher from one person to the other so that they can gain knowledge of the system of beliefs that exist within that particular group (Saunders et al., 2018). This method of sampling was useful for this study as it enabled the identification of varying viewpoints and lived experiences associated with the issue of environmental compliance. This assisted the study as it added insight on the topic at a deeper level.

Therefore, the participants that were selected met the specific criteria in order to be eligible for the study. That criterion for inclusion in the study was as follows:

- They must be employees of the provincial or national government associated with the transportation industry's planning and developments in the City of Johannesburg.
- In addition to that the individual should have some expert knowledge regarding environmental laws and compliance in the transport industry in the City of Johannesburg.
- Nevertheless, those that do not form part of the transportation industry but are involved directly with issues such environmental compliance assurance such as ambient air quality analysts, environmental management inspectors based on the referral from the environmental compliance officials, will also be included to add value to the research topic on a broader scale.

The participants that were included in the study were professionals that have experience in the issues of environmental compliance and environmental management. Furthermore, participants were also those that deal with the environmental compliance at the city of Johannesburg Municipality. The focus was on officials that were of various levels to avoid being one-sided or bias based on speaking to a group of individuals that all see the world in the same manner.

There was a list compiled with all the officials that had the necessary knowledge regarding environmental compliance and sustainability in Johannesburg and referrals were made by individuals that were interviewed. After that the relevant participants were given an opportunity to confirm their participation in the study. Furthermore, information regarding the level of commitment required should they agree to participate along with a breakdown

of the purpose of the study. Finally, once the participants had agreed to participate in the study, a date, time and place at the participant's convenience were decided on.

3.3.3 Data Collection tools

The process of collecting data is defined as a systematic means of gathering information that falls in line with the research study's problems and aims (Kitchin and Tate, 2000). Methods that are often used in qualitative research include interviews, focus group discussions, case studies, and the review of documents or literature (Kitchin and Tate, 2000). These qualitative tools are of significant value in research that is exploratory. The review of literature or documents encompassed the use of sources such as national and provincial legislation, policies previous studies conducted in South Africa and elsewhere, theses and relevant and reliable internet sources. Ideally, this was a means of collecting data that was employed along with the use of the interviewing method.

The study employed two data collection methods, namely semi-structured interviews and document analysis. In the document analysis method, the aim was to retrieve any meaningful information available regarding environmental compliance in South Africa and the rest of the world. Furthermore, to also compare cases and deduce relevant information that can aid in enhancing the status quo of environmental compliance in South Africa. The aim of collecting the data was to identify the processes involved in environmental compliance post the EIA process. To identify who follows up on the commitments to comply, moreover to identify what are the pieces of legislature that are associated with environmental compliance and what institutional frameworks facilitate environmental compliance.

3.3.3.1 Interviews

Interviews in qualitative research are often semi-structured or unstructured (Edwards and Holland, 2013). Interviews possess the following common attributes: there is an interactional exchange of dialogue; there is a thematic approach where particular topics of interest or issues are pre-set but in a fluid unstructured manner; meanings and understanding is co-produced through the interaction, resulting in the construction and reconstruction of knowledge through the interview process (Edwards and Holland, 2013). Interviews are quite meaningful as they are a learning process for both the interviewer and the interviewee, where each party learns about a particular aspect of themselves without that being the initial goal of the interview process.

Interviews can be conducted in various ways such as telephonically, face to face, and through the internet. However, before their conduction certain ethical considerations need to made to ensure that no harm is brought to the participants of the study. As previously mentioned the relevant participants will be contacted again prior to the agreed date and time for the interview to confirm availability. Some of the respondents will be snowballed meaning a referral will be made as to who else can be contacted and spoken too. The face to face method which we will employ will be most useful because it will facilitate engagement and the unpacking of necessary information. The interviews will be kept to a reasonable time of 45 minutes and will be conducted in a respectful and courteous manner. A set of guide

questions will be written and a form to complete the answers will be brought along to each interview. For the sake of not missing any information, permission was obtained to record the session.

3.3.3.2 Document analysis

It is known that much information can be retrieved from written text; examples may be newspaper articles, previous research conducted, and reviews of legislature, national and provincial reports (Kitchin and Tate, 2000). These all carry useful information regarding the topic of interest and provide a comparative platform for the researcher. This method as previously mentioned will be used to further understand the issue of environmental compliance in the South African context.

Document analysis is a method employed in qualitative research, where a systematic process is used for reviewing and evaluating documents which are both printed and electronic (Bowen, 2009). Similar to other data collection methods in the qualitative sphere, it requires that data is examined and interpreted in order to extract meaning, obtain a kind of understanding, and extend empirical knowledge (Bowen, 2009). The analytical procedure involved in this method includes finding, selecting, making sense of and amalgamating the data contained in the document. This information yielded is then organised into major themes, categories, and case examples (Bowen, 2009).

This research required the consultation of a number of policy documents that speak to environmental management and environmental compliance. The documents used for the analysis of the legislative frameworks and the institutional frameworks are as follows: The Green paper on Environmental policy for South Africa (GPEP) (DEAT, 1996), the National Environment Management Act (NEMA) 107 of 1998, the White Paper on Environmental Management Policy (WPEMP) (DEAT, 1997) and The National Environmental Compliance and Enforcement Report (NECER) (NECER, DEA, 2016). Furthermore, there will be a document analysis regarding the Rea Vaya Rapid Bus Transit Project, where documents such as the Environmental Report conducted by Grutter Consulting (Switzerland) titled BRT Rea Vaya Phase 1A and 1B South Africa.

3.3.4 Data Analysis

Document analysis is often used in combination with other qualitative research methods by means of triangulation. Triangulation is defined as the combination of methodologies in a study of the same phenomenon (Bowen, 2009). For this reason, in addition to document analysis, the use of interviews was also incorporated in order to seek convergence or verification of the data. The triangulation of the data allowed us to provide a convergence of evidence, thus making the results credible (Bowen, 2009). Bowen (2009) further argues that triangulation is advantageous as it shields the researcher from accusations that the study's findings are a mirage of the truth based on the use of one method, one source or one investigator's bias. In the interpretative paradigm, some studies may solely use document

analysis and no other method as it can stand robustly on its own (Bowen, 2009). However, for the purpose of this study it was believed that the interviews served to contribute substantially to the research study.

To further elaborate on the analysis, the data were analysed using the thematic content analysis method. This method of data analysis is the most commonly used method in qualitative research. It is a method that is focused on finding mutual patterns across the data set (Maguire and Delahunt, 2017). This was done in a series of steps namely: familiarising yourself with data as the researcher, coding the text, searching for themes that are expansive, reviewing the identified themes to see that they correlate with the data, define and name the themes, then do the write up that includes direct quotes from the interviews (Maguire and Delahunt, 2017).

3.4 Methodological Reflections

The study was conducted in Johannesburg thus making the topic of interest local. It was limited to the results observed in the City of Johannesburg, and by means of interpretation, one could see if this is a reflection of environmental compliance and environmental sustainability in South Africa. Furthermore, the study was limited to the transport industry, not to say that the other industries are less significant but rather because not enough research has been done with regards to the ever-growing industry and its relationship with the environment, more especially in Johannesburg.

Most environmental studies have been centred on the idea that mining or waste is far more environmentally degrading (Middleton et al., 2011), overlooking the impact the transport industry also has on not just the wellbeing of the natural ecosystems but that of humans too. The Study will review existing documents such as legislation pertaining to environmental compliance and engage with supporting literature that speaks of similar case studies conducted, internet sources, academic journals, and topical journals. The study will also focus on the possible reasons for the lack thereof environmental compliance in not just the transportation industry as presumed, but also in the greater Republic of South Africa.

Methodologies are known to have advantages and disadvantages. Some advantages of using interviews are noted as follows by Edwards and Holland (2013): They give more in-depth understanding of the topic at hand by drawing out social processes, institutions discourse, and how relationships work. Interviews highlight the importance of the generation of meaning. They also provide information regarding the understanding, imagining and experiences of the participants.

Some disadvantages or challenges of interviews which are stemmed from quantitative critics are as follows: Interviews are illustrative and descriptive and they cannot be replicated and lack rigidity (Bowen, 2009). Furthermore, they cannot be generalized because it is unsystematic. These critiques are often justified when interviews are not conducted appropriately or documented correctly, and when there is a lack of an epistemological stance (Edwards and Hollands, 2013).

Some advantages of document analysis include the following, it is known as being an efficient method as it is less time consuming and is therefore more efficient than other methods

(Bowen, 2009). It is also accessible and available meaning that many documents are in the public sphere and some do not require permission from authors. Documents are also stable, in the sense that the researcher's presence does not affect what is being studied (Bowen, 2009. Documents also provide broad coverage of the topic at hand, and cover a long time span.

Nevertheless, there are also a few limitations noted by Bowen (2009) that are associated with this method such as: Insufficient detail is evident in documents as not all documents are produced for the purpose of research some are produced to serve a different agenda, thus not all information regarding the topic or research problem may be retrieved. Some documents may be hard to retrieve as they may be deliberately blocked by the authors. Furthermore, some sources of the documentations such as institutions may only make available what they think are in line with their policies and procedures in order to promote a particular agenda. This is known as biased selectivity (Bowen, 2009).

Some on the ground limitations of the study, included the struggle experienced going into a professional space confidently, especially as a black female The officials who had more knowledge about the topic at hand, at ties would intimidate the researcher, and attempt to redirect the vision of the research project. Therefore, as the researcher one needed to be firm, yet fluid enough to earn and engage sufficiently with the participants. Furthermore, there was an issue getting in contact with environmental practitioners that look at environmental compliance, as the majority focus on the EIA's.

Other limitations of the study include issues such as officials not being available for the schedule interviews due to unplanned call outs. There was also the issue of getting permission from organisations to conduct interviews, the response in some instances was delayed, therefore delaying the progress of the research, due to slowed data collection.

Opportunities that may be presented to future reearcher is the fact that there is an evident need for increased research in issues such as environmental compliance and an interesting take would be one that includes the investigation of efficiency of enforcement structures. As they play a crucial role when compliance is not adhered or evident. There is also a need to see if the patterns picked up in this study are also evident or replicated in other sectors such as mining and manufacturing.

Chapter Four

Empirical Evidence

4.1 Introduction

Empirical evidence can be defined as the acquired or observed information obtained through studying a phenomenon (Brandford, 2017). Therefore, this study required adequate representation of the empirical evidence obtained during the data collection process. This chapter seeks to bring to the fore the key empirical evidence gathered during the data collection process. Furthermore, this chapter is aimed at presenting the views and perspectives of the individuals and literature and is essentially structured around the research questions that were asked in chapter one of the dissertation however these feed into the aims of the research project too.

4.2 Overall Resulting themes from the Study's Data Collection

I. Institutional frameworks and compliance in South Africa

One of the key issues that this academic study was interested in included trying to adequately address the apparent discrepancies in identifying institutions that speak favorably to environmental compliance in South Africa. Additionally, in trying to do so, the following results were obtained from the study. In the National Environmental Compliance and Enforcement Report (NECER) it is mentioned that Institutional frameworks are defined as being the applicable law or another recognized provision that designated the primary responsibility along with the authority to a responsible agency for the extensive collection, processing, and dissemination of environmental compliance. A substantial number of established institutions are ordinarily involved in environmental compliance, and that would speak favorably to a specific project like the Rea Vaya RBT. South African Institutions for environmental compliance undoubtedly exist at various levels of democratic governance. A comprehensive inventory of all the appropriate departments that look at environmental compliance and environmental management is found below. This selected list was carefully compiled through the rapid appraisal of the academic literature, Internet searches and the qualitative interviews efficiently conducted with the relevant stakeholders.

Table 4.1: Table of the Institutions that deal with compliance in South Africa feeding down to Johannesburg.

Name of Institution	Year of Establishment	Nature/mandate of Organization	Level of Governance/ Jurisdiction
Department of Environmental Affairs (DEA)	DEAT (from 1994 to 2009) DEA (2010 till current)	Responsible for protecting, conserving and improving the	National

Formally known as Department of Environmental Affairs and Tourism (DEAT)		natural environment in South Africa. Department of the South African Government	
National prosecuting Authority (NPA)	1998	Bill of rights and section 179 of 1996 constitution of the Republic of South Africa formed one single prosecuting authority. Act 32 of 1998 brought the NPA into existence. (NPA, 2014)	National
Gauteng Department of Agriculture and Rural Development		Responsible for overseeing the environment, agriculture and rural development. In order to ensure sustainability in the social. Economic and environmental sense.	Provincial
City of Johannesburg (CoJ) Metropolitan Municiplaity.	Established in the year 2000, but has been transitioning since the year 1993.	Manages the local governance of Johannesburg. Has an environment and infrastructure department overseeing city developments and private developments in the city.	Local (Municipal)

In view of the identified institutions, the used interviews generally revealed interesting components that gave more context and meaning to the institutions and their practicality. The selected participants were asked what are the environmental compliance institutional frameworks that exist? This key question seemed to be answered evasively with considerable reluctance by the numerous environmental practitioners interviewed. From what was gathered, there was a disjuncture in the fundamental understanding of what an institutional framework may be. Therefore, to avoid sounding confused or unknowing, participants provided vague responses or asked for me to define what an institutional framework is. The present institutional structure was further elaborated on in the document analysis portion of this dedicated chapter as insufficient information was obtained from the respondents with regards to this. However, Respondent 4

importantly mentioned that: “Government institutes typically oversee environmental compliance, and these ordinarily include established institutions like DEA” (Interview 4, female). Other significant institutions that were mentioned appropriately include, the CoJ, GDARD, and San Parks associated with the specific Gauteng region.

Nevertheless, it is meticulously documented that another critical element associated with local institutions of environmental compliance is public participation. Public participation intentionally allows local citizens the democratic right to participate in environmental protection (Chompunth, 2013). The participants that were interviewed highlighted that public participation was of vital importance for environmental compliance objectives. A large portion of the shareholders noted the need for local involvement as the public act as the ears and eyes of the environmental practitioners. These whistleblowers are adequately protected and rewarded accordingly when distinct entities are successfully convicted as this is catered for in NEMA 107 of 1998; 2008.

While productively engaging with the academic literature key components that speak candidly to the established institutions was carefully documented to further elaborate on the institutions reported in Table 4.1. The DEA is linked to the ministry of water and environmental affairs and is responsible for all environmental affairs and decision-making. According to the South African Constitution, it is indicated precisely that responsibility for the environment is conventionally divided between the provincial and the national government. Although compliance is dealt with by the provincial competency, the DEA represent the national authority that controls environmental affairs and is located in the capital of South Africa, Pretoria (NECER, 2016).

The Department of Transportation is the responsible institution for the regulation of transport in South Africa (not mentioned in the table as it is not a direct institute but is valid due to the study of the Rea Vaya). This undoubtedly includes public transport, railway, civil aviation, shipping, freight and motor vehicles (DEA, 2011). The other institutions involved in the effective enforcement of environmental compliance ordinarily includes the National Prosecuting Authority (NPA) and the South African Police Service (SAPS) (not included in the table as it is not a direct institute).

GDARD is the local authority/institution that is at the provincial level. Their specific mission is to properly oversee the environment at a provincial level, so as to typically encourage the ecological well-being of the local people in Gauteng (DEA, 2015). Furthermore, GDARD handles enforcement because they oversee much of the development that takes place, as they are the provincial authority or institution. They report all environmental implementation plans back to the director general at the national level (NEMA, 1998). At a local level, the municipality that is of interest is the City of Johannesburg (CoJ). The department has an environment and infrastructure department that typically oversees compliance and enforcement and is strategically located in Braamfontein, Johannesburg. Any development that ordinarily occurs at a city level is properly overseen by CoJ (NECER, 2016). Each provincial department is obliged to ensure that each municipality assuredly has an environmental implementation plan and that they voluntarily comply with it and the director general will vigilantly monitor this compliance (NEMA, 1998).

With regard to the Rea Vaya in the planning phase EIA’s were conducted to ensure that construction does not negatively impact the environment in the CoJ this is reiterated by Respondent 2 in her interview (Interview 2). Moreover, the CoJ is worked closely with GDARD to get the necessary approvals and authorizations for the construction of the various sections of the

BRT system (Rea Vaya, 2017). The Rea Vaya was a CoJ project under the department of Transportation, other project participants included the CoJ Department of environment and infrastructure which is responsible for overseeing the environmental management policy and planning, and the implementation of projects that reduce greenhouse gases (Grutter, 2011). The institutional authorities that were associated with the Rea Vaya BRT are summarized in the figure below,

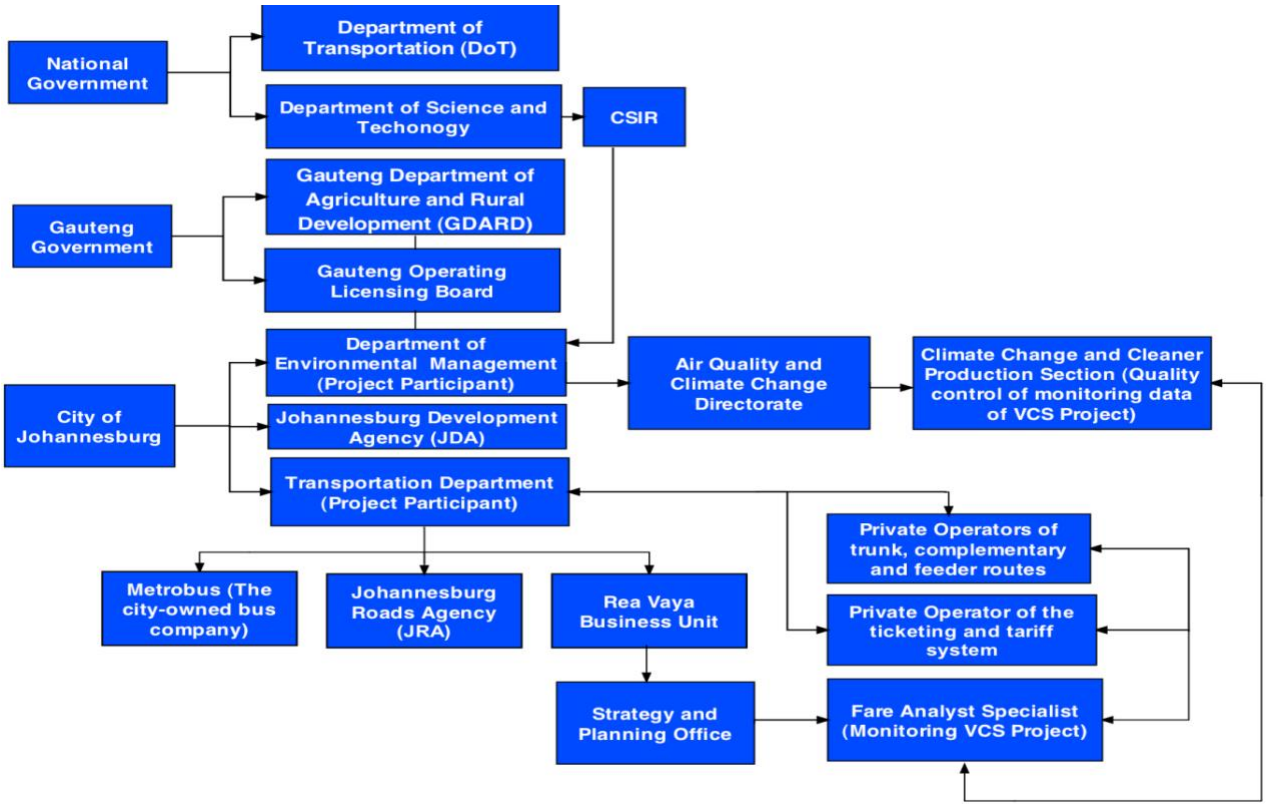


Figure 4.1: Organization chart of the Rea Vaya project (Source: Grutter, 2011)

According to the Grutter (2011) The Rea Vaya project engaged with the CSIR (The Council of Scientific and Industrial Research) who worked with the Department of Science and Technology (DST), and the Department of Environment from the City of Johannesburg. They provided feedback to the Air Quality and Climate Change Directorate who then supplied information to the Climate Change and Cleaner Production Section (Quality Control of Monitoring Data of VCS Project), and finally providing information to the Fare Analyst Specialist (Monitoring VCS Project) as seen in the flowchart in figure 4.2. That is therefore as far as project's organisation went with regards to the environmental elements of the project.

II. Role of Environmental compliance officers

During the interview portion of the data collection environmental practitioners or stakeholders were interviewed individually from various sectors (See figure 4.3). The municipality of the city of Johannesburg, private sector environmental consultants whom preferred to be kept anonymous, some consultants from the provincial environmental institutes and some individuals that had knowledge regarding the Rea Vaya Rapid Bus Transit. These stakeholders are mentioned in the Appendix using psedu-names as I ha mentioned in the ethical considerations and the

participant sheet that their anonymity will be guaranteed. Nevertheless, it is interesting to note that the largest portion of participants (70%) were from the private sector. This observation will be further elaborated on in chapter 5 of the thesis.

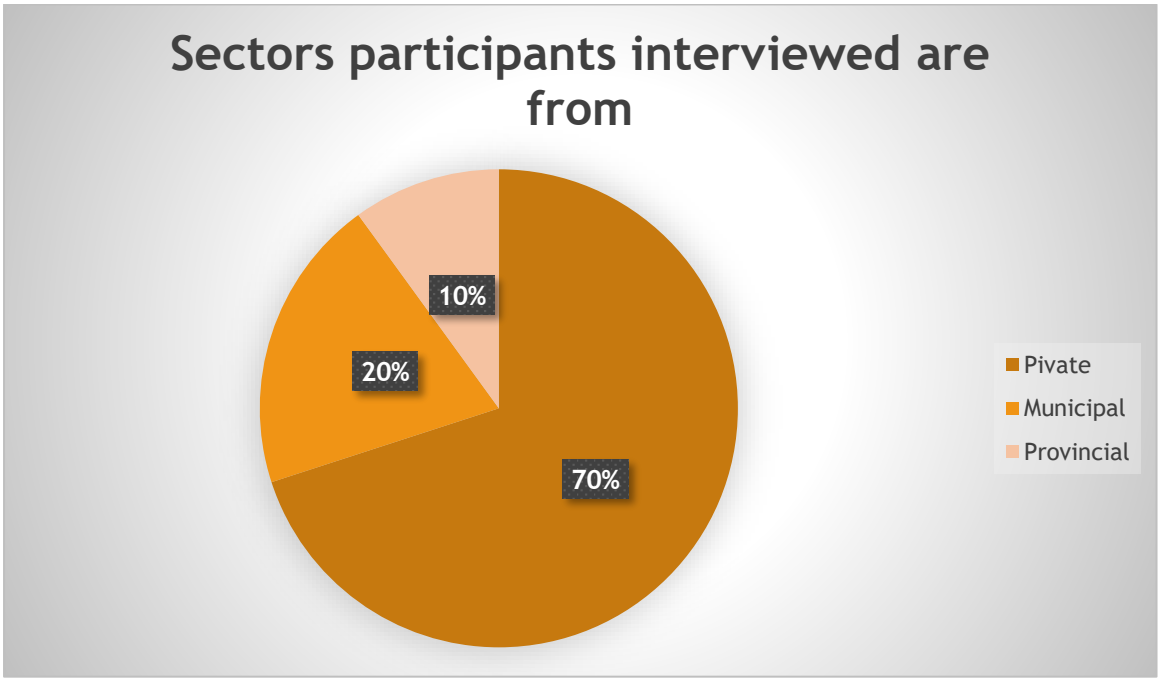


Figure 4.2: The sectors that the participants belong to.

The back ground portion of the interview was utilized to get a feel of the participants, by firstly getting an understanding of what they believe environmental compliance entails. Moreover, where their professional back ground stems from and what influenced their decision to venture into a career that engages with environmental compliance. Furthermore, the aim was to also engage with what exactly their job specifications are, or what is the kind of work they do on a regular basis and also how much experience they have in that space. This would help to distinguish between the connoisseur and the less experienced experts interviewed. Lastly, it was also used to identify particular values associated with the various environmental practitioners dealing with compliance. As we believed that the values you have are crucial when dealing with legislature and the monitoring of compliance (Deloitte, 2009).

The following information was obtained from the background portion of the interview sessions along with the respective documents that were analysed. According to the National Environmental Compliance and Enforcement Report for the financial year of 2016/17 In the municipality of the city of Johannesburg there are designated environmental practitioners that deal with environmental compliance, they are known as Environmental Management Inspectors (EMI) (NECER, 2016). According to Respondent 1, when asked what environmental compliance entails, he responded confidently saying “Environmental compliance, essentially means at a minimum, all legislature whether environmental law, whether national or local requirements in terms of complying with certain conditions” (Interview 1, male). On the other hand, Respondent 2 highlighted an interesting legislative element in her response which is the fact that legislation is pivotal to environmental compliance, she stated: “NEMA is the legislation that I focus on, but

there is other legislation that also needs compliance such as the biodiversity act, air quality act, water act and waste act" (Interview 2, female).

Respondent 3 believes that environmental compliance entails meeting certain conditions stipulated in order to avoid adverse environmental issues or effects. He is further quoted as saying, "Environmental compliance is about organisations ensuring that they meet the needs stipulated in environmental conditions of authorization, in order to minimise the negative impacts they may have on the environment" (Interview 3, male). However, respondent #5 struggled to find the best way to define environmental compliance but eventually settled for "...Conforming to environmental requirements obtained prior to thecommencement of a project. This can be in the form of permits" (Interview 5, female) although this definition seemed vague; it still possessed an important element which is the terms environmental requirements, which is essential to environmental compliance discourse (NECER, 2016).

Nonetheless, Respondent 2 was further asked about her job role or specifications she mentioned "I am more impartial, I do not do the fining of entities… as a part of the city sector, and my role is more advisory and involves monitoring. I go to the site and investigate when complaints have been made. I investigate whether they have triggered any environmental legislation violation. If they have, I then assess the best way to remedy it." (Interview 2, Female). Whereas the other type of EMI's such as Respondent 3, play a different role. He describes his job role as follows: "I conduct inspections which is more of a proactive role. I receive a complaint from the members of the public and then act on it. I check the site and see that they are complying with conditions listed in the Environmental Impact Assessment (EIA). If ever they do not comply, the operations will no longer function. I can issue the entity a compliance notice." (Interview 3, Male).

The two varying responses highlight the different roles and the scope of environmental management inspectors that work at the City of Johannesburg (CoJ), designated by the state in South Africa. These EMI's are also known as the green scorpions as they enforce the environmental legislature through their powers to seize operations or contribute to arrests (DEA, 2017). These powers are often dependent on the grade of the EMI, Grade 1 to 4 are often located the EMI institutions (such as for instance the CoJ) and they deal with compliance monitoring, administrative and criminal enforcement (NECER, 2016). Moreover, the Grade 1 to 4 EMI's focus on solely the brown, green and blue sub sectors. Then there is the grade 5 EMIs are designated field rangers who perform compliance and enforcement responsibilities in across various national and provincial protected areas in South Africa (DEAT, 2008).

However, according the NECER 2011/12 (DEA, 2008) it is reported that the provincial environmental authorities attempted to make significant strides towards adequately preparing for the designation of trained local authority officials as EMI's (local in this context is the municipal level). Furthermore, the DEA negotiated with stakeholders of various discipline such as the Health Professional Council of South Africa, the National Department of Health, the South African Institute of Environmental Health and selected educational institutions in order to work towards the development and the presentation of a bridging course for Environmental Health Practitioners who would like to be designated as EMIs (DEA, 2008).

While conducting the interviews, it was noted that several of the environmental practitioners had been in their current roles for less than 5 years. Respondent 1 said: "I started at the provincial level, I was then designated to the local level in Johannesburg, so I worked for two years at

national level and now two years at local level so in total that is 4 years" (Interview 1, male). This was documented in the pie chart below. An evident 40% had been working in compliance for more than 2 years, 35% had worked for less than 2 years and the lowest percentage is that of respondents that had worked for more than 10 years.



Figure 4.3: The number of years working in Environmental compliance

With regards to the values and attitudes of environmental compliance officials, the majority of the participants had the belief that environmental compliance officers or environmental management inspectors should conduct themselves professionally so as to not compromise their work. This is indeed essential in this line of work. Therefore background checks of individuals and commitment to adhere to the ethics in the code of conduct are said to be mandatory. Furthermore, individuals caught transgressing or not abiding by the signed code of conduct are either suspended or dismissed. Respondent 3 said: "When you caught not adhering to the code of conduct, there is a loss of employment. When we go on site, we are not permitted to take any gifts from for instance a perpetrator /offender. If you take something, and it is found out, it is considered a bribe" (Interview 3, male).

III. Environmental Compliance legal frameworks (Environmental legislature)

The environmental practitioners interviewed were asked what the legal requirements for environmental compliance in the transport industry are; the participants gave responses such as NEMA, and the Air Quality Act, Respondent 15 said: "Each environmental legislature has compliance associated with it. So if we are to speak of the transport industry there is very little information, but in my knowledge, it should be complying with the Air Quality Act and NEMA" (Interview 15, female). The environmental legislature that currently exists in South Africa varies consisting of the Air Quality Act 39 of 2004, which is essential for the minimisation of health effects associated with air quality, such as lung diseases, the effect air quality has on

property through environmental hazards such as acid rain, ozone depletion and most importantly climate change.

The National Environmental Management: Waste Act 2008, which was a necessity due to the uncontrolled illegal dumping that was happening, the environmental injustices of poor black people who lived in areas that were not serviced and were used as places where dumping could happen, and more than 60% of landfill sites were polluting the environment and destabilizing environmental sustainability objectives (Glazewski, 2009). Another act is The National Water Act 36 of 1998 (NWA) which is useful for the control of water use and the minimisation of pollution of water systems in the industry. The Environmental Conservation Act 73 of 1989, the National Environmental Management Act 107 of 1998 (NEMA) which is the principal environmental legislative framework, the National Environmental Management: Biodiversity Act 10 of 2004, National Environmental Management: Protected Areas Act 57 of 2003, and the Specific Environmental Management Act (SEMA) as defined in NEMA (NECER, DEAT, 2016).

Table 4.2: Summary of the environmental legislation

Environmental Legislature	Year	Applicable to transport Industry
Constitution of the Republic of South Africa	1996	Yes(indirectly)
Environmental Conservation Act 73	1989	Yes (indirectly)
Development Facilitation Act 67	1995	Yes
National Energy Act 34	2006	Yes
National Environmental Management Act 107	1998	Yes
National Environmental Management: Air Quality Act 39	2004	Yes
National Environmental Management: Biodiversity Act 10	2004	Yes (to some extent)
National Environmental Management: Integrated Coastal Management Act 24	2008	No
National Environmental Management: Protected Areas Act 57	2003	No
National Environmental Management: Waste Act 59	2008	Yes
National Water Act 36	1998	No
Spatial Planning and Land Use Management Act 16	2013	Yes

NEMA started off as the environment conservation act of 1982, however, since then, there have been multiple developments to the South African environmental legislation. The most significant of these developments was the enactment of NEMA in 1998 (Glazewski, 2009). It is argued that NEMA is crucial for environmental sustainability, as it permits key environmental principles that are grounded in the Conservation Act. These include accountability and precautionary principles. The Act speaks to environmental principles through compliance and enforcement. The principles that give way for compliance include the cost of remedying pollution, environmental degradation and consequent adverse health effects. Furthermore, preventing, controlling, or minimising

further pollution, environmental damage, or adverse health effects must be paid for by those who are responsible for harming the environment.

Chapter 7 of NEMA speaks to environmental compliance, enforcement, and protection. According to the legislature subsection 7, it states that should a person fail to comply or inadequately comply with a directive under subsection 4, the director-general or provincial head of department may take reasonable measures to remedy the situation (Glazewski, 2009). Nevertheless, key legislation that reiterates the importance of environmental protection and advocates for environmental sustainability is the constitutional right that everyone has to a) an environment that is not harmful to their health or wellbeing b) to have the environment protected for the benefit of present and future generations. The Green paper, 1996 on Environmental management is the policy framework for environmental issues in South Arica. Environmental policy plays a chief role in meeting the developmental needs of people in the new democratic South Africa. The policy allows for citizens to hold government to account for its action (GPEM, 1996).

The follow up to the Green paper is the White paper 1997 which is the finalised policy for environmental management. A policy has two essential goals, these are namely, to inform the public of what the government's objectives are and how they plan on obtaining them and secondly, to provide directions to state entities, and the means to attain particular goals (WPEM, 1997). The white paper is the overarching policy framework, and it applies to all government institutions, as well all activities that will have an impact on the environment (WPEM, 1997). One of the goals in the white paper is to create an effective institutional framework and legislation. This can be done if adequate resources are allocated, synchronized institutional framework and well-integrated legislative system, coupled with increased institutional capacity. This is where the thesis contributes to. This policy framework is so well constructed and has all the components needed on paper. If successfully implemented the country's environmental sustainability goal would not seem too daunting.

According to Strydom and King (2009) in South Africa the concept of environmental management is envisioned from both a legal and a scientific perspective. The South African constitution of 1996 allowed for a new approach to environmental law, governance and management through the provision of the right to an environment that is not harmful to their health or wellbeing (Strydom and King, 2009). As a by-product of this constitutional right the white paper on environmental management policy was drafted. This White paper highlighted that people are at the centre in concerns regarding environmental sustainability and are essentially a part of the environment. This policy allowed for the citizens of South Africa to hold Government to account for its actions and omissions (DEAT, 1996). The crucial environmental policy that was initially introduced through the green paper was envisioned to make a significant contribution to the betterment of the quality of life of all citizens in South Africa (DEAT, 1996). According to the DEAT (1996) this will manifest through compliance with standards, monitoring and reporting that exhibits a perceptible enhancement in the sustainable use of resources.

The policy states that in order to attain the above-mentioned goal, a list of objectives would have to be used. On that list of objectives is the need to review legislature to see that it is still applicable to the context and complying with the constitution. Legal audits would also have to be carried out to see if the legislature still does what it was intended to do. However, according to literature when one delves into environmental compliance, the key national legislation that speaks to South Africa, are namely the National Environmental Management Act 107 of 1998 and the Specific Environmental Management Act (SEMA) as defined in NEMA (DEA, 2017). NEMA is an

act that provides co-operative environmental governance by forming principles used in decision making when dealing with issues that affect the environment (NEMA, 1998). Furthermore, NEMA is the mother act for environmental compliance because the principles of the Act speak to elements such as accountability. When participants were asked about how these legal measures are enforced, some of the responses included the opening of criminal dockets, fines are given out to perpetrators, convictions, and some administrative notices are handed out to perpetrators. According to DEA (2017), there are two categories of enforcement that can be administered; these are namely administrative enforcement and criminal enforcement.

Nevertheless, as the focus was essentially on the environmental compliance of an entity such as the rea Vaya document analysis was needed as the respondents gave very limited information on the project. According to Rea Vaya (2017) there are about 16000 commuters that use the buses every day. The BRT name Rea Vaya which means 'we are going', provides the residents of the City of Johannesburg municipality a safe and affordable transportation alternative (Rea Vaya, 2017). This is a city project, aimed at improving public transportation, reducing congestion on the public roads, bettering the environment and lastly creating employment opportunities. The bus routes of the Rea Vaya are captured in the map below (Figure 4.4).

As it is known the City of Johannesburg is actively working towards becoming a world-class city, therefore with the large population density that it currently has, environmental implications such as pollution come along with it. Therefore, the reduction of Johannesburg's public transport carbon footprint is of utmost importance and a significant contribution to mitigating climate change and reducing traffic pollution from congested roads. The Rea Vaya is currently the largest climate change initiative ever undertaken by the CoJ, and it represents a revolutionary means of reducing not just traffic congestion on roads which creates air pollution, but greenhouse gases produced by transportation. According to the Rea Vaya (2017) research, it is estimated that a potential 1.6 million tons of Carbon dioxide emissions could be dropped, if people used it. This is a monumental step in the right direction for environmental sustainability.

The policies associated with the Rea Vaya according to Grutter (2011), is only transport related. There is no policy with a measurable impact related to greenhouse gas emissions that is associated with the project. Furthermore, regarding compliance measures, the only laws that are stipulated as of importance to the development are mentioned below.

Table 4.3: Legislature associated with the Rea Vaya BRT

Transportation Legislation		**Land use Legislation**	**Other relevant Legislation**
National	Provincial	National	
Urban Transport Act, 1977 (Act 78 of 1977)	Gauteng Public Passenger Road Transport Act, 2001 (Act 7 of 2001)	Development Facilitation Act, 1995 (Act 67 of 1995)	National legislation mandates the inclusion of accessibility issues in the provision and planning of transport.
National Road Traffic Act,	Gauteng Transport Infrastructure Act, 2001 (Act 8 of 2001)	Local Government Municipal	The Promotion of Equality and Prevention of Unfair

1989 (Act 29 of 1989)		Systems Act, 2000 (Act 32 of 2000	Discrimination Act (2000) goes further by outlawing discrimination on the grounds of disability. This principle echoes the objective for transport articulated by the disability sector itself, as provided for in the White Paper on an Integrated National Disability Strategy (1997): *"To develop an accessible, affordable multi-modal public transport system that will meet the needs of the largest numbers of people at the lowest cost, while at the same time planning for those higher cost features which are essential to disabled people with greater mobility needs."*
National Road Traffic Act, 1996 (Act 93 of 1996)	Gauteng Transport Framework Revision Act, 2002 (Act 8 of 2002)	White Paper on Spatial Planning and Land Use Management, July 2001	
National Land Transport Interim Arrangements Act, 1998 (Act 45 of 1998)	Gauteng Transport Framework Amendment Bill, 2001		
National Land Transport Act, 2000 (Act 5 of 2009)	Gauteng White Paper on Transport Policy		
National Land Transport Strategic Framework, 2002-2007			
National Environment Implementation Plan, First Edition (Notice 3410 of 2002; Government Gazette No 24140 of 13 December 2002)			

However when the participants were asked about the level of compliance in the transport industry, the participants did not quite know how to adequately answer the question. Many felt that the transport industry was not a sector that compliance officials focused on or were even granted the opportunity to work with regularly. They would work with for instance the construction of the roads for the transport system, but not necessarily focus on for instance emissions created by transport entities, or the pollution they produce. Respondent 9, stated: "With the Rea Vaya project there was an EIA conducted prior to the construction and operational phase, to see if the roads for instance would be affecting any environmentally sensitive areas such as rivers or vegetation.

There would be various elements that would need to be considered to see that the project complies. However, once the Rea Vaya BRT is on the road operating, from a NEMA perspective there is no monitoring protocol that needs to be followed in order to comply with legislation. But when we get a complaint from the public regarding the project, we notify GDARD and enforcement needs to take place" (Interview 9, female).

When Respondent 6 was interviewed he mentioned a concerning but important element associated with compliance in the transport industry which was the following: "The regulations in terms of the national department are not fully implemented, climate change associated regulations are international standards, therefore locally there is very little if not nothing to work with as an environmental practitioner that focuses on monitoring and Compliance, it makes my line of work very difficult" (Interview 6, male). Respondent 16 agrees with this notion he therefore mentions "…it is not to say that there is no environmental legislation that the transport sector needs to comply with. During the planning phase the entity (Rea Vaya) will come to the Impact department, in order to get an environmental authorization, which is a living document that ensures that even in its operational stage they comply with the condition set out in the authorization. This authorization can be issued in terms of NEMA, or even DMR" (Interview 16, male).

Respondent 12 brings to the fore another important element associated with the transport industry, particularly the Rea Vaya RBT, she states that "…the Rea Vaya which was or rather is a phase project, that's linear in nature. Meaning there were different sites, and each site had some environments that needed to be considered in the EIA. Therefore, it was broken down into phases, similar to the Gautrain project. Environmental authorization needed to be obtained for each site for example in Soweto, Alexandra, etc. You then have to consolidate all the information from each site of the project." Respondent 14 mentioned in his interview that environmental compliance in the transport industry is still growing and finding its place in South Africa. He says: "I think in South Africa they are still looking into the bill with regards to the carbon emissions tax, which should be but is not yet in place. So I believe once that has been put in effect, it will address issues of compliance in the transport industry" (Interview 14, male).

However, according to documents analysed there is particular pieces of legislature that speak to the Transportation industry in the city of Johannesburg. These include the National Environmental Management (NEM): Air Quality Management Act (Act 39 of 2004) which provides framework legislation for the management and regulation of air quality, and the setting of ambient air quality and emission standards (DEAT, 2008). Furthermore, the NEM:

Amendment Act (Act 46 of 2003) (first Amendment Act), of which deals with the compliance and enforcement and offers Environmental Management Inspectors (EMI's) (DEAT, 2008).

IV. The social and environmental impacts of Environmental non-compliance and a lack of enforcement

They are having interviewed the participants to get a feel of the impacts that environmental non-compliance has on the society, economy and the environment. Interesting elements were expressed by the respondents and the literature gave further insight on the guiding second research question. For instance the respondents were asked how effective the penalties for non-compliance were; and Respondent 3 mentioned during his interview that he felt the penalties were quite effective: "I believe that the penalties are effective, as the compliance notice that we issue is a legally binding document, once it has not been adhered to, we refer the entity to the legal authority such as the National Prosecuting Authority. They then receive a fine that can range anywhere between R1 and R10 Million. The fine is determined at the discretion of the court, and most entities would want to avoid this penalty at all costs, and therefore change their environmental management and monitoring plans accordingly" (Interview 3, male). Environmental management plan is an essential tool for organizations to meet their conditions and remain compliant with any relevant environmental legislation. The EMP is a tool used to safeguard the environment against any negative impacts associated with the construction, operation or decommissioning phases of a project (NEMA, 1998).

Respondent 1 mentioned that most entities would not want to tarnish their image with non-compliance, he was quoted as saying "They (development entities/organisations) would not want to see their organization in a bad light, so they would want to comply." But, he also added "…in my personal observation, I believe that more needs to be done. We should have separate prosecutors, who specialize in the environmental field. Currently, in South Africa, we do not have good prosecutors who know about environmental management. If you look at the conviction rate, I do not think it is happening at the rate we had hoped for. We really need environmental courts and prosecutors that take environmental issues seriously" (Interview 1, male).

According to DEA (2017) Non-compliance has been documented as disadvantageous to organisations because it hinders them from reaching their benchmark of sustainability which is obligatory in our current times; furthermore, there has been increased competitiveness in the industry between organisations, therefore compliance to environmental legislation allows for fair competitiveness. Furthermore, non-compliance has financial implications for organizations, it also ruins the reputation of the organization, creating a ripple effect on the employees and the greater economy of the state. Having to pay for lawsuits, fines, loss of revenue, job losses, and shut down of the organization are all elements that feed into greater societal issues such as poverty (Cory and Green, 2017).

The pollution or degradation of the environment usually affects the grass root members the most, and in most instances, these individuals are from disadvantaged backgrounds, with little or no voice. Respondent 2 mentions that communities need to be rewarded if they report an issue that follows through to conviction, this is vital because essentially they also have a right to the space they occupy and should be able to stand up against environmental injustices. The notion of otherness gets manifested in spaces where power dynamics are allowed to manifest itself. In some

instances, organizations do not include the public in the planning phase and just commence the project hoping that no one will notice. In instances such as that, public environmental awareness is crucial.

Nonetheless, when organisations choose to not comply they infringe on the rights of the public, which entitles them to an environment that is not harmful to their wellbeing, and that is sustainable (NEMA, 1998). Non- compliance also has social injustices attached to it; some environments may hold historical or cultural values that need to be protected for the social psychology of that environment. Nevertheless, non-compliance also has financial repercussions, as non-compliance gets heavily fined once the prosecution has occurred. In other instances, enforcement that occurs due to non-compliance can be administrative, or criminal nature. Administrative enforcement can be in the form of formal or informal warnings; this can be in the verbal sense too. There can be directives, notices, and court applications to enforce directives, interdicts, and suspensions of authorisations NEMA, 1998). These enforcements need to be taken seriously because when a significant number of notices have been received hefty fines are soon to follow, these can be great financial setbacks. In some instances, organisations may have to be shut down resulting in a loss of jobs and economic strain on employees. Furthermore, there are instances where imprisonment is plausible, thus tarnishing the name of the organisation and the individuals involved (NECER, 2016)

When the Respondents were asked about the overall challenges experienced with environmental compliance in the transport industry, Respondent 2, mentioned that some companies may choose to not spend money on getting the authorization for the project, so it is not put in their financial budget or plans. When they do get reprimanded for having not followed due procedures they just opt to pay the fine and do a rectification report. Some other overall challenges that are experienced were noted as follows, “Organizations do not recognize the role we (environmental management inspectorates) play in terms of the city of Johannesburg, and therefore do not recognize how we could be of assistance to them. If they come to us before they initiate the project, we would be able to tell them what needs to be in place before they commence. The value we have in terms of the city needs to be changed”- Respondent 3 (Interview 3, male).

Respondent 1 added on to this idea by stating that “Many of the local authorities in South Africa tend to view environmental management inspectors/officers as someone who is blocking or standing in the way of development. We need to be recognized as being of importance” (Interview 1, male). Respondent 12 brings a challenge that is of an internal nature, she said:
“There are a lot of challenges internally, some employees have connections with higher-ranking officials, and do them favours. These favours even our own powers cannot change, as they override our decisions. It is very disappointing, difficult and disheartening, when you do all you can to protect the environment, only for the project to be given the go ahead. It is selfish and demoralizing” (Interview 12, female).

Respondent 10, mentioned that political agendas is of paramount importance: “It is about achieving political goals and nothing more. The officials all have targets and goals at different levels of government. If we seem to be preventing them from attaining it, they find ways around it. The focus is on the politically advantaged being of priority” (Interview 10, male). Respondent 13 speaks of the challenge of a voiceless environment. She argues “people need to remember that the environment has no voice and it cannot be heard. We are just the ones to ensure that it is heard. We are not stopping development; we are actually trying to improve the environment and

ensure that your kids and future generations are able to live and survive on this planet. Without the environment we have nothing."

Respondent 15 stated when asked of the effects of non-compliance to society, "I believe people do not understand the level of responsibility we hold as humans living on planet earth, there have been instances where non-compliance has led to the destruction of an entire ecosystem and the death of even human lives. Furthermore, with the rise in GHG in the world it is the developing countries that get the brunt of this as we often do not have the necessary adaptive measures. I believe that choosing not to comply is an act of selfishness that has repercussions for everyone but more importantly the vulnerable members of society. Such as the poor and the grass root members of communities."

Pamela Boyle in her interview argued that "Non-compliance is really an act of extreme negligence and should be handled with great seriousness because the results of that negligence can in some instances lead to the loss of lives, the destruction of habitats, and the contamination of fresh water sources amongst many other things. Even more economically it creates an unfair competitive advantage that should not be encouraged. I think that compliance enforcement needs to be enhanced as some entities carry on not complying to the environmental legislature because they believe that they can live with the punishment. However, the nob compliance creates a ripple effect of negative outcomes, as it damages land, exploits people and destroys heritage even. In the instance of a transport system like the Rea Vaya which required land to for construction and promised to have engines that reduce GHG emissions regular audits need to be made where measurement of pollutants coming from the engine can be examined and compliance is ensured timeously."

V. Environmental compliance as a tool for environmental sustainability

As mentioned in the thematic consideration and literature review of the thesis, environmental sustainability is a goal that environmental policy and legislation is working towards. Therefore, environmental compliance speaks univocally to environmental sustainability. During the interviews conducted with the participants, questions were asked to establish their understanding and perceptions about environmental sustainability and environmental compliance. When asked by the researcher "what does environmental sustainability mean to you? Respondent 12 replied saying "It has to do with balancing the environmental, social, and economic needs to attain sustainable development. Some politicians may want development to go ahead irrespective of the fact that the area that it is in is a sensitive one. All these elements need to exist in harmony to achieve sustainability." Respondent 18 is quoted in her interview as saying "From my perspective, environmental sustainability is solely about the environment. It speaks to us as environmental management inspectors, since our aim is ensuring that the environment is protected at all costs. This is in order for future generations to also experience it" (Interview, 18, female).

Some of the other participants agreed with the views that Respondent 18 put on the table. Respondent 8, mentioned that environmental sustainability for her means "Trying to find different methods of taking from the environment but still allowing it to continue functioning. Therefore, finding ways to rebuild the environment so that it can sustain itself again after having received services from it" (Interview 8, female). The other participants gave similar versions of these

answers when they were asked the same question. This view of sustainability can be associated with the weak sustainability model, which was highlighted by Jenkins (2009).

When the participants, were asked how they feel about the state of environmental sustainability in South Africa, the responses were as follows, Respondent 20, mentioned that "In South Africa, sustainability can be difficult to achieve because during the planning phase environmental issues are not considered or ranked highly." Respondent 16, speaks to the idea of pristine, "I don't like the state of environmental sustainability in South Africa. We should be doing better, there is very little pristine land and I believe that we do not need construction everywhere. We need to try get back to that place where the environment is kept as it is, since the environment also carries psychological benefits for society." Respondent 7 mentions that there are strides made in the sake of the protection of the environment and environmental sustainability in South Africa, such as the amazing legislature and policy that we have. But the issue comes in when implementation needs to occur, there is a lack of capacity in most cases. Therefore, the lived experience of environmental sustainability on the ground is completely different from the theoretical idea of it.

Moreover sustainability is part and parcel of environmental management as stated by Respondent 18 (Interview 18, female). Therefore, the respondents were asked how they feel about environmental compliance being used as a tool for environmental management. According to Respondent 20 who speaks of environmental plans. He states: "environmental compliance aids in environmental management but the EMP needs to be good, because some entities do not even know what an EMP is, so we need to teach them. People working on the ground in the entity or organization need also to be aware of the EMP and understand it, in order to avoid confusion" (Interview 20, male). The idea of EMPs is very crucial to compliance as it acts as a tool that facilitates environmental compliance with organisations, it promotes a culture that is value-based and furthermore encourages accountability and responsible practice (Deloitte, 2009).

Respondent 11 said, "environmental compliance is the only thing we have that holds people accountable; it is really how we get to where we are going on our environmental agenda." However, Respondent 15 mentions the importance of environmental compliance in environmental management by saying "of course environmental compliance is a tool for environmental management. If we didn't have environmental compliance officials that tell people about how they are not complying with conditions of authorizations, there would be no recognition of the importance of the environment" Furthermore, Respondent 6 adds to this idea and, states that South Africa has the best environmental legislation and policies in the world, they are very effective and have already started baring some fruit. It is now up to the people of the country to make an effort to comply with such legislature, and awareness needs to be raised in marginalized communities about environmental issues, degradation and their environmental rights. I am hopeful about things.

An important aspect that was mentioned by Respondent 1 is the term awareness, which is so important in the mechanism of environmental compliance. Furthermore, the concept of environmental justice is central to a topic such as awareness, as this awareness allows for public interest and public participation in projects, and the active inclusion in the protection of their environment. This in turn creates a form of connection with their environment and allows for a sense of agency to develop. This is crucial in spaces here marginalized people are often not included in the decision making process. Environmental justice speaks to an underlying truth

which is that grass root members of communities are often the most negatively impact by environmental issues; these grass root members are often people of colour or people that are from an disadvantaged background. Schlosberg (2001) argues that institutions that exist without a platform for participatory actions should be deemed indefensible. Fortunately, enough through the evolution of environmental management in South Africa, social and environmental injustices associated with development had to be addressed and allowed for the change in legislation and policy (NEMA, 2008).

Some final thoughts regarding how the respondents felt that environmental compliance could be further enhanced and pursued in order to promote effective environmental management and long term environmental sustainability. Questions such as how they saw environmental compliance developing in the future had various constructive responses such as that of Respondent 6 who said "Legislature needs to keep getting refined, and we need to keep going the way we are going, NEMA is getting amended again which is great" (Interview 6, Male). Respondent 3 said "Compliance monitoring needs to be improved; there are very few inspectors that follow up on the compliance. Maybe there can be a self-monitoring system" (Interview 3, male).

According to documents analysed the idea of a self-monitoring tool to aid in compliance is becoming popular in many private organisations. This forms part of their environmental management system and plans of which international standards such as iSO14001 obligate. Respondent 4 spoke of human capital; she believed that "Human resource is a challenge and a study conducted on the effectiveness of compliance tools showed that some tools are not effective on-site, and with my personal experience… I agree we struggle with getting practical ways to get organisations to comply with the environmental legislature, without efficient training on such a topic." (Interview 4, female). However, Respondent 17 said, "I believe that each organisation needs to have an onsite environmental compliance officer, in South Africa, there are very few of these. What should be done is the officer that did the EIA should follow through and do the compliance too. Unfortunately, not enough people are being employed to do this line of work. There are also not enough environmental compliance officers in the field to help build up capacity" (Interview 17, male).

However, Respondent 2 (Interview 2, female) said thoughtfully, "there need to be more prospective students that go into this chosen career path to increase compliance monitoring capacity. I worked professionally in private and then had to achieve a gradual transition from the investigative report writing to practical implementation which undoubtedly proved to be terribly difficult for me. This was predominantly because I had no compliance experience. Therefore, I believe a gap can be overcome by students looking to come into this sector of work. I wish to observe this development." Respondent 7 hopes that local authorities will invest in EMI's to inspect the level of compliance on the ground and declares "I know the legislative reforms will absolutely allow for progressive changes for environmental compliance in South Africa." Respondent 8 said, "Local Environmental courts are required in South Africa to reduce the environmental crimes, I hope it gets implemented, the environment needs this for its survival." Respondent 10 merely said, "I am optimistic for the future, people will take us seriously in the planning phase so that we are proactive and not reactive. I sincerely hope all citizens will become more aware of their environmental rights.

The participants were further asked what advice would they give to state officials, local authorities, or companies regarding environmental compliance in the transport industry and the

participants responded as follows “We need to be very serious about what we are doing. We should not forget about the grass root people after the public participation stage.”- Respondent 14 (Interview 14, female) “Companies need to be more aware before they start a project they should draft what needs to be done, send this to GDARD, and then measures can be made to comply before commencing. – Respondent 15 and “Companies should ask for permission, never ask for forgiveness is the motto I always give my clients” – Respondent 3 (Interview 3, male)

Furthermore Respondent 2 highlighted that the communities need to be rewarded when a crime has been reported and successful conviction has occurred. This will create awareness and highlight how seriously compliance needs to be taken. This idea falls in line with the idea that the OECD advocate for the idea that a lack of enforcement of laws creates a value system where compliance is not of value. However, Respondent 7 was of the view that “Environmental specialists that work on the compliance of organizations should be as objective as possible.” Respondent 9, an environmental consultant that works in the private sector is of the view that “As the government, we need to have the capacity or an institution that audits these specialists, and make sure that these specialists do not have interests in the company.”

However, Respondent 11 believes, there is a lack of professionalism in the environmental compliance domain; people need to learn to take their work seriously. Additionally, responses include the following “Environmental compliance officers need to be uncompromised, unmoved and unshaken by their values” from Respondent 15. Furthermore, Respondent 18 is of the view that we need to have passionate individuals working with the environment in order to avoid corruption and bribery. Respondent 17 is of the conviction that “Sustainability and compliance should not be a debate; people should just adhere to it.” This is a view that stems from a profound ecological perspective and a clear indication that the environment should be preserved for future generations. Respondent 6 stands with the notion that the Government needs to create legislation that does not have loopholes. This has not just been an issue that Respondent 6 is facing but an issue experienced in countries such as China and Nigeria, where there are institutional flaws that are allowing for the dissemination of practising out the law. Respondent 9 argues in her interview session that environmental compliance should be made doable, and not painted as a daunting task for companies, we need to change from obsolete methods to contemporary ones in order to reduce the reluctance expressed by companies and individuals.

4.3 Conclusion

This chapter typically focused on the comprehensive presentation of prevailing views and unique perspectives gathered from the interviews and the document analysis. This information was adequately presented in various forms using appropriate graphs, tables, and text. The qualitative interviews were carefully analyzed and grouped using thematic analysis; the same was done for the document analysis. The data was finally grouped according to relevant themes that emerged and were focused on answering the research questions while still contributing to the associated research aims presented in chapter one. These included institutional frameworks and compliance in South Africa, the role of environmental compliance officers, environmental compliance legal frameworks, the social and environmental impacts of environmental non-compliance and a lack of enforcement, and environmental compliance as a tool for environmental sustainability. These responses from the interviews along with the document analysis which were thoroughly engaged brought to the fore key components such as the lack of direct environmental compliance institutions associate with the transport industry, the current status quo of environmental

compliance and the presented challenges like for instance the play of power and the incomprehensive legislation and guidelines for implementation. The collected data reached a point of saturation, as no new information was being documented from the respondents, therefore validating the study furthermore, the documents were able to provide the required information considering the lack of vast research on the topic and also reached a point of saturation, where there was no longer any new information obtained.

Chapter Five

Analysis and Discussion

5.1 Introduction

This dedicated chapter seeks to demonstrate how the research objectives were achieved. This is accomplished through data analysis and discussion where we have drawn out some inferences of the study based on the data that was collected and further categorised in order to address the research questions of the study. Moreover, the inferences from the data then addressed the research objectives and aims of the study. This procedure finally allowed for practical conclusions and recommendations to be made in the concluding chapter of the thesis (Chapter 6).

5.2 Perspectives on challenges facing environmental compliance in the transport industry in South Africa.

The environmental policy and legislature of South Africa are amongst the most sophisticated in the world. The detail and vision are accurately depicted in the various environmental laws and policies as mentioned in the previous chapter. Unfortunately, there is fragmentation between this legislature and its implementation on the ground. The institutions in place to help implement the legislature are very strained and plagued with a lack of human resource and passionate enforcers as evident in the study's empirical analysis.

This apparent gap feeds into the significant level of non-compliance experienced in Johannesburg which is mirroring a trend experienced in greater South Africa too. This non-compliance is not just limited to civil or criminal laws but of particular interest that of environmental laws in South Africa. Case studies of non-compliance which were documented in the NECER 2016/17 include, the case of the Mineral Sands (Pty) LTD versus the magistrate for the district of Vredendale (Western Cape) Case No: 18701/16, and inspections and enforcement of industries such as the case of BHP Billiton Metalloys Meyerton, Gauteng (Now known as South 32), Vanchem Vanadium Products (Pty) Ltd, Sasol Secunda Refinery, Mpumalanga, Natref, Free State. What is interesting to note here is that if one is to engage with the report, there is evidence of inspections done at Ferro-Alloy, Steel and Iron Sector Refineries Sector, Power Generation, Cement Sector, and Paper and Pulp Sector industries (DEA, 2017). However, there are no reported inspections done in the transport industry highlighting that a progressive paradigm shift in the prioritization of the transport industry is obligatory.

In South Africa, the institutions that speak to environmental compliance exist at various levels of governance as stated in chapter 4. Each mandated to oversee compliance within their parameters. However, the DEA still has the authority to override some decisions made, as the national authority (DEA, 2017). This can be challenging to other institutions that may have decided that a project is not compliant and needs to be ceased from operating. Often than less like in many other developing countries, there is a struggle of power and political agendas that stands in the way of effectively enforcing laws, the same applies to the South African context.

These established institutions are essential for environmental compliance as they oversee and monitor compliance, and can penalize those that neglect their responsibility to comply. Glazewski, 2009 (2018) precisely describes environmental compliance as steadfast adherence to environmental laws, applicable regulations, and established standards. This adherence needs to be carefully monitored to ensure the entity is compliant; this is precisely where the established institutions have a pivotal role as described in the specific case of Nigeria (Agbazue et al., 2017) in the literature review found in chapter 2. The officials that work in these institutions as compliance officers mentioned some of the challenges that they encounter include entities that adamantly refuse to voluntarily comply and believe they can merely pay their way out of the necessary task. This highlights the moral values society typically carries with them now; however, maybe also highlights that the punishment could not be as effective as they had envisioned.

The enforcement measures may ideally need to be re-visited. In a country such as Nigeria according to Adegoke (1994), environmental compliance historically started with many challenges. However, there were focal areas that allowed for the gradual development of improved environmental enforcement. These included the creation of enabling instruments such as the right to do random inspections, and the issuing of hefty fines or jail time if found to be dishonest about compliance. The creation of institutional frameworks, through the creation of the federal protection agency along with zonal or regional offices, a consultative and policy-making forum called the National Council on Environment. These measures that were implemented coupled with public involvement and capacity building has allowed for increments of improved environmental enforcement. These measures evident in the case of Nigeria can be used in the context of South Africa, where there need to be investments made in the capacity building and strengthening of institutions.

According to Respondent 6 (Interview 6, Male), who expressed that some independent organizations feel the compliance process is too lengthy and costly to an organization so they evade it all together and prefer to just bribe officials for as long as they can. Moreover, some organizations merely pay a private environmental practitioner to correctly apply for their specific authorizations and never genuinely have a personal interaction with the active policies or their environmental management plan. Instances like this highlight the need for more stringent processes and an example of how loopholes can be discovered to bypass the system. These issues above represent challenges that require innovative measures to ensure individuals are more willing to cooperate.

In addition, some high-ranking officials that were interviewed credibly reported that organizations found that the compliance seemed unattainable, and felt it was an impossible task, so they voluntarily chose rather to dodge it until they got caught out. It seems to be too much work to properly obtain authorization, yet it can undoubtedly be squandered. Therefore, to adequately address contentious issues like this, there needs to be a re-evaluation of how environmental compliance manifests itself in the South African context. Some questions that came to the fore include are the tools and bureaucratic structures in place to allegedly aid in environmental compliance conducive for organizations? Are there efficient self-monitoring systems available for those that willingly choose to have an onsite compliance officer in their organizations? Furthermore, is profit prioritized beyond ecological systems, and are the hegemonic discourses that fuel the need for capitalist power outweighing the desperate cries that the polluted

environment is making? These remain crucial questions and sensitive areas of interrogation that are most often overlooked by state officials and decision makers.

There is a fundamental need to conscientize local policymakers regarding the prevailing notion that producing great policies is extremely useful for environmental protection and sustainability but what is even more beneficial is securing the appropriate people efficiently implementing it, so as to not just be sustainable in theory but also in practice. There needs to be a legitimate means of modern development that takes into consideration the voiceless environment. This feeds into the moral idea of deep ecology where the sensitive environment essentially should be conserved by all means. According to the European Commission (2018), they argue persuasively that compliance with environmental laws and stringent regulations on the ground like in industry, utilities and even landowners adhering to environmental requirements associated with their activities is extremely vital for sustainability. However, the European Commission (2018) also argue that the probable cause for weak implementation of environmental laws, and applicable regulations are rooted in ineffective mechanisms for environmental compliance assurance and proper governance.

To realistically achieve environmental compliance in the transport industry, standards need to be intentionally set through a statutory framework, therefore creating a demand for improving legally binding instruments. Furthermore, this should be adequately communicated to the environmental officials at the various institutions in order for the elected officials to enforce it. Furthermore, according to Deloitte (2009), compliance values and goals need to be disseminated to various appropriate levels of management and employees in an organization, as this allows for the possible cooperation of all notable members of the company. The issue with the current institutions in place is that power still influences the possible outcome of specific authorizations, making it difficult to be professional. This is rooted in economic and ideological hegemony and power associated with the idea of capitalism (Yilmaz, 2010). Controversial issues of being allegedly bribed represent normalized personal and political agendas which have promptly taken first priority over the environment. Furthermore, it is equally advantageous to critically engage with the notion that South Africa is uniquely characterized with a dynamic socio-historical backdrop severely tarnished with racial issues and unjust segregation, feeding into the social need for environmental justice as reported by Patel (2009). This facilitated the apparent reluctance to trust system of laws as these were initially used to oppress specific individuals; therefore, South Africa has a compliance problem to not just environmental legislation but other laws too.

Environmental Management Inspectors, like those that were interviewed at the CoJ offices, are elected representatives of the environmental compliance and enforcement capacity in respect of NEMA and SEMA (DEA, 2017). In DEA and GDARD, there are EMI's, and they are justly ranked between grade 1 and 4. These grades mirror the compliance and enforcement powers that have been conferred in terms of chapter 7 of NEMA (DEA, 2017). These EMIs are moreover known as the green scorpions. Furthermore, to aid compliance there is enforcement, and the two exist simultaneously as mentioned by the Natural Resource Defence Council NRDC (2010). One of the institutions responsible for effective enforcement is the National Prosecuting Authority (NPA) (DEA, 2017). Unfortunately, according to the research study, much of the official capacity of environmental compliance officers is lacking. There was 70% of the respondents that believed that the state needs to allocate more considerable capacity in environmental compliance and management. This lack of political capacity inadvertently creates challenges like a critical lack

of compliance monitoring which is crucial in environmental compliance assurance (NRDC, 2010), in most instances, this associated with the lack of funding or financial resources severely exacerbates environmental non-compliance in South Africa.

5.3 Alternatives to facilitate environmental compliance in the Transport industry in South Africa

Environmental compliance as mentioned by the participants in the interviews conducted and academics is crucial for environmental sustainability, but it also feeds into theoretical components such as environmental justice and integrated environmental management (Patel, 2009). If South Africa wants to make progressive strides in environmental compliance in the transport industry, there needs to be a serious re-evaluation of the strategies currently in place. One of these crucial elements that need to be revisited is funding. There needs to be more financial support injected in the compliance and enforcement of environmental legislatures. Furthermore, there needs to be an increase in training and skills of those that are already in the field, as many issues are rooted in the notion that officers are not confident in the knowledge they have and therefore cannot sufficiently guide organizations that seek to become compliant.

International efforts to ensure environmental compliance are becoming increasingly popular and systems that facilitate this are being regularly produced. One such an example is that of the International standards ISO14001 which typically require that companies have an environmental management system that gets audited (Block, 2001). This ISO14001 enforces three associated requirements. These are as follows, firstly the organization must pinpoint all of its environmental legal obligations and familiarize themselves with all the environmental laws and regulations that apply to the organization. Moreover, the organization needs to be intentionally creating an environmental policy that will facilitate complying with the necessary environmental legislation. Lastly, environmental compliance with identified legislation must be evaluated on a self-determined periodic basis; it can be in the form of an audit also which is referred to as an environmental compliance audit (Block, 2001). In the case of the Rea Vaya BRT, there is very little environmental involvement in its compliance monitoring. The legislature that speaks to it is more transport related because it is assumed that the environmental elements are dealt with in the planning stage and that is where it culminates. Furthermore, they do not have an onsite environmental compliance officer to ensure the environmental compliance system is functioning.

The limitations associated with the Rea Vaya project during the data collection stage of the research like being unable to speak to compliance officials that worked on the project made it difficult to acquire the lived experience of the officers regarding the development of the project. Therefore, the focus was shifted towards whatever documents that could contribute to the information needed regarding the project's environmental management system speaking to compliance of environmental law. According to the table of compliance to laws of the Rea Vaya in the previous chapter, one can identify that there is very little environmental law that requires compliance. This is quite confusing because a development as large as this should have environmental law that it complies with during the operational phase. This project is mentioned as being a progressive means to curb Greenhouse gas emissions, by gradually reducing congestion and using better engines in the buses. But nothing in the reports positively speaks to the

compliance of air quality legislature. It is notable the international air quality legislature could be of significance to a programme such as this. Furthermore, there must be a form of waste generated due to the operation of this project. This is unmentioned in its reports, but what one should be noting is that even the waste act is of use to a project like this.

There is also environmental auditing that needs to be made and provided to the public so as to see that commitments made in the EIA are followed through to the operational phase and if the public notice the lack thereof, it can be addressed accordingly. Political accountability is essential when environmental sustainability is at stake. The Rea Vaya BRT subtly highlights a political agenda too, because it develops a perception of the city of Johannesburg to the world, creates carbon credits for the country. However, one should then wonder if the project is designed for the local people of the country or for the government and its political agendas. In the report conducted by Grutter (2011) one can see that the only environmental focus of the project is how it is part of the clean development mechanism (CDM), and how it is the most monumental project of its kind in the City of Johannesburg.

There is very little data available regarding the operational effectiveness of the Rea Vaya project in contributing positively to environmental sustainability. The selected participants in the qualitative interviews could not shed too much light on the ambitious project as the central institution involved with its environmental element and compliance is GDARD, who could not avail themselves for the interviews. At a municipal level, the project could only be monitored from a NEMA perspective, and compliance tools regarding for instance air emissions from the buses is unavailable. Therefore, South Africa needs a restructuring of the understanding of the implications the transport industry has on the environment and find ways to incorporate air emission standards that speak to public transport emissions.

The Transport industry is unquestionably one of the most significant industries as it allows for the connection of various geographical locations and spaces. Of which if we did not possess such an industry much of the economy would crash. Nevertheless, considering this mammoth role that the transport industry plays, there needs to be better environmental compliance there, a partnership with institutions like the department of transportation could be a fruitful collaboration. There needs to be accountability and a follow up on so-called environmentally beneficial projects like the Rea Vaya. Are there meeting the intended targets they set out with regards to reduced GHG emissions from the direct roads? Are there still ongoing consultations with the public after the commencement of the project to ensure they are happy with the way that the project is operating and the changes it is making to their immediate environment? These are all valid questions that require efficiently follow up strategies to ensure that development is occurring in an environmentally just manner.

5.4 Pursuing effective environmental compliance in South Africa

In order to pursue effective environmental compliance in South Africa, there are measures that actively need to be put in place in the institutional context, legislative context and the social context too. There is a specific need for effective public awareness to willingly endure that the relevant stakeholders can engage in the compliance process. From a legislative perspective public participation is properly accounted for but on the ground, there is often

very little of this done, and in some specific instances the public participation is limited to being a façade written on paper.

Environmental education is another unique form of bringing about ecological awareness regarding environmental management and it typically allows for the active encouragement of public participation. In Nigeria, there has been a move towards increasing public participation in environmental compliance monitoring, where the aim is to enlighten the public in every area of the government regarding the adverse effects of environmental pollution, and the beneficial effects a stimulating environment can have on the economy (Agbazue et al., 2017).

Furthermore, an avenue that the government could venture on is that of the inclusion of green corps, which provides local citizens the possible opportunity to participate in environmental compliance and monitoring, through volunteer work under the guidance of the NESREA. This is a very progressive way to create a sense of connection with the environment for local citizens through participatory actions and it helps to generate a form of moral responsibility too. Moreover, there needs to in addition be a kind of partnership or co-operation with other agencies to help increase the capacity and resources allocated to environmental compliance as documented by the NRDC (2010). This may include an effective partnership with private entities and NGOs to create a continuous flow of innovative ideas and possible policies and tools that could potentially enhance environmental compliance objectives. Furthermore, there could be international or regional collaborative actions through the inclusion of other countries in order to produce regional bodies that oversee or study compliance in the various countries in Africa such as the OECD have done.

Nevertheless, environmental compliance mechanisms remain the key to effective environmental compliance in South Africa, there needs to be the inclusion of onsite environmental compliance officers in every organization who will be in charge of creating and maintaining the organization's environmental compliance system and who will follow up on the obligations made in the EIA process or post the EIA process. Moreover, there needs to be the specific issue of environmental compliance certificates from a designated compliance institute, which needs to be renewed after a particular time period. This is an effective strategy that is currently being employed in countries such as the Philippines. Whereby, any project that poses any form of environmental risk or ecological impact such as for example, mining, agriculture, and construction needs an environmental compliance certificate in order to operate in the Philippines (Cortez, 2016). There also needs to be periodic inspections performed at organizations by external entities, to ensure that the organization is compliant with the relevant laws and standard. Furthermore, there needs to be the use of compliance notices as these are designed for the identification of non-compliant agents, these are useless if no serious follow up is incorporated (Feris, 2006).

South Africa needs to also place more resources in establishing environmental courts that oversee environmental violations, and these courts should consider professionals that are of the environmental sphere overseeing the cases brought to the court. As the current status quo, the courts that deal with environmental violations are often those of general law background and are therefore lacking an in-depth understanding of the environmental issues and violations. We are of the belief that environmental crimes cannot be prosecuted the identical way as other crimes are prosecuted. Furthermore, there need to be readily available

and regularly updated standards for various elements to ensure that the public more especially marginalized and grass root members of the community can follow up on the developments that occur in Johannesburg, and in their immediate environment.

5.5 Environmental compliance as an opportunity for environmental sustainability in South Africa.

Environmental compliance essentially is a very progressive tool for environmental management and sustainability. Environmental compliance allows for accountability as mentioned in the interviews. Aspects like section 28 and principle of the duty of care in NEMA (1998), brings to the fore the notion that as the polluter you have to take responsibility to clean it up. The environment is voiceless, and it is up to environmental practitioners to advocate for it, which is why professionals like EMIs should use the powers they have been given to create a positive effect on the environment. The values that an environmental compliance officer possesses should be in line with being passionate about the environment and should maintain integrity, as the environment should be the priority (Peluso, 2012). The EMIs that were interviewed mentioned their line of work is very dependent on being someone of good character and integrity. There have been instances where fellow EMI's lost their designation because they had accepted gifts or bribes from organizations that were non-compliant. The participants that were interviewed shared various views on how effective they felt environmental compliance was in South Africa.

The general sentiment observed in the interviews was there were still some adjustments that need to be done. There needs to be improved enforcement that accompanies compliance. The state needs to discover innovative ways to increase human capital as there are countless projects developing that require compliance monitoring, but the lack of manpower hinders attaining environmental management goals such as efficient environmental compliance (Godwell and Inyang, 2011). Nevertheless, an increasingly significant contribution to the thesis was the need for improved environmental courts and ambiguity needs to be removed from the legislature. This ambiguity allows for organizations to find loopholes which even environmental compliance officers may be unable to justify. In the annual compliance report conducted for the year 2016/2017, more facilities were inspected in comparison to the previous year. The number increased from 3687 in 2015/2016 to 4379 in 2016/2017. This is a valuable indication that compliance measures are being better incorporated and prioritization is being made in efforts to improve it.

Another crucial component that was highlighted in the interviews conducted was the need for more capacity as compliance monitoring is not happening the way it should. There are not enough inspectors or compliance officers available to follow through with the complete compliance process. This subsequently allows for companies to develop an inability to follow through with the compliance in their environmental management systems. This gap can be attributed to various possible issues like a lack of financial resources, not enough professionals specializing in compliance and even a lack of awareness regarding the demand for it. According to the interviews conducted and the available literature regarding environmental management in South Africa, it seems that most environmental practitioners seem to be swarming towards the EIA's which are great for the planning stage but we need compliance officers too.

Various legislatures require compliance in South Africa like the national air quality act, the national water act, national waste act, and the protected areas act, as they all require authorizations and compliance monitoring. The issue of making great legislatures but the lack of implementation is also evident in developed countries, as an example of this is expressed by the European Union (2018), who report that non-implementation costs the European parliament over 50 million Euros and they have identified the need to improve their environmental compliance and governance. In South Africa a similar pattern is evident and there is a need for reform in the manner in which environmental compliance is pursued.

Two particular theories to compliance are adopted in South Africa; these are namely the rationalist and the normative theories. The rationalist view stems from a conservationist approach where deterrence is relied on. This deterrence occurs by enforcement being ensured through arrests and criminal prosecution (Fuggle, 1990). Alternatively, the normative and most evident view in an industry has a more placatory approach to compliance and enforcement. This approach has allowed for more community orientated participation and cooperation. But the inclusion of the EMIs has steered South Africa back into a more rationalist approach, where punishment is the central enforcement strategy to encourage compliance and increase environmental sustainability.

Environmental compliance is not just a domestic component but an international one too. There are some environmental instruments used in South Africa due to the international obligations that South Africa has signed too. The flaw with this is it serves to be problematic to implement these tools when they have not been specifically designed for the African context, as most of these international partners who are part of these environmental agreements are developed and a country such as South Africa is however in its developing stage. The root of this problematic means of incorporating environmental tools in South Africa is rooted in the top-down approach that it chooses to incorporate. This approach is often disconnected from the genuine needs of the people on the ground and often adhering to these kinds of tools or legislature is frequently met with reluctance. The approach that has proved to be more successful is the bottom-up approach because this allows for the public to actively play a role in developing environmental instruments that will be employed in their current environments. This, in turn, promotes environmental sustainability.

Environmental compliance management systems (ECMS) are also being used more in the industry. This is because they are more specific and work around precise compliance objectives. Elements of an environmental compliance system are included in the diagram presented below; these tools are essential in getting organizations to meet their legal obligations and keep track of their compliance levels. This is an approach to environmental compliance that can accommodate companies such as the Rea Vaya, where they can log in their compliance goals and ensure that they are compliant through the use of a vigorous compliance monitoring systems which are of a technological nature.



Figure 5.1: Graph of the elements of a possible ECMS (Source: Student's own)

The elements of a compliance management system are pivotal in not only organizations but also in the broader context of the government, to ensure environmental compliance measures need to be in place that tackles each component (Legislation and strategy, compliance promotion, implementation of obligations, monitor, enforcement and review. Compliance promotion can be done in various ways through environmental education and conscious environmental awareness. According to Agbazue et al. (2017), in Nigeria efforts have been produced to promote environmental compliance. This has been done through advertising media, where people are made aware of the harmful effects associated with environmental pollution, to encourage local community members to participate in environmental improvement initiatives.

This fundamental idea can be incorporated into the promotion of environmental compliance in the transport industry too. Members of the local community can be informed of the impacts that the transport system is mitigating through promotional advertisements. In that sense, they can equally be held liable for any environmental transgressions that the public may pick up. The issue with providing information solely on the company websites and digital platforms is that many grass root members are unable to acquire the information due to financial restriction or the lack of access to computers, cell phones or the internet. It is recognized that the discriminatory racial past of South Africa has left people of colour in a place of economic disadvantage. However, participatory actions have been included in efforts to allow for environmental justice to infiltrate in economic development projects.

5.6 Conclusion

The chapter engaged with critical discussions surrounding the intricacies of environmental compliance and environmental sustainability in South Africa. This was done on the back drop of the Rea Vaya BRT which falls under the transportation umbrella. There is an evident need for an awareness of the roles that institutions can play in facilitating environmental compliance in South

Africa. The data that was collected brought to the fore elements such as the fundamental need for resource allocation where funding is made available to increase the capacity of environmental compliance officers and the institutions that they can belong to. There is also a need for increased training as many officers seem to lack the needed confidence in the knowledge they have about environmental compliance, more especially in the transport industry. In order to pursue environmental compliance in South Africa, there needs to be a transformation that begins at the highest level of governance and trickles down to the local levels. There needs to also be a social awareness that needs to be made which facilitates public participation in the process of environmental compliance and enforcement efforts. Environmental compliance as an opportunity for environmental sustainability in South Africa does not have to seem far-fetched. Environmental compliance is a very progressive tool for environmental management and sustainability. The authority that environmental compliance officers have needs to be reinforced. There needs to be a sense of responsibility that entities and individuals have when they use the natural environment, and accountability is a crucial value that needs to be instilled

Chapter Six

Conclusions and Recommendations

6.1 Introduction

The following chapter will provide some conclusions of the study and has carefully structured around the discussions and empirical evidence of the study, along with some personalized recommendations and that was able to create as suggestions that could add value to the body of knowledge on environmental compliance and environmental sustainability.

6.2. Summary of key findings

The Aim of this study was to investigate the challenges and opportunities for environmental compliance and sustainability within the context of the transport industry in Johannesburg This was successfully highlighted through the data collected from the interviews and the document analysis. A key realization is a fact that South Africa is a fast developing country that often finds itself suffering from the same disease as many other African countries, and that is the need to adopt structures and policies that are not specifically catered for the country. This is often propagated by political agendas and personal economic gains.

According to the data analysis of the study, the thematic analysis highlighted that the level of compliance development in South Africa is not yet where it should be, because there are still a significant amount of perpetrators committing environmental violations and crimes at the expense of human lives and the environment (as mentioned by the majority of interviewees). This is disturbing revelation as it cripples the potential for sustainable development and defeats environmental sustainability goals. The institutional framework for environmental compliance is in a sense fragmented, due to the gaps such as power that facilitate non-compliance from organizations.

The thesis was able to highlight the institutional frameworks that speak to environmental compliance in South Africa, while also speaking to the environmental legislation that allows for environmental compliance to be existing. These are all mentioned and elaborated on in chapter 4 and Chapter 5. The thesis also touched the repercussions of non-compliance to environmental law and how these repercussions have a ripple effect on the current and future potential of society. These effects cut across various aspects of the environment, society, and the economy.

The Rea Vaya BRT was used as a case study for this thesis, because the CoJ has a dense population that congests the roads and creates increased GHG emissions from the traffic pollution. Developments such as the Rea Vaya BRT has proved to be of great value in transporting the people of Johannesburg. Moreover, it came with environmental benefits making it that more attractive to the public and the government. The project conducted its EIA's and applied for approvals for the construction of the system and further created compliance measure for chiefly the transportation legislation and very little on the environmental legislature associated with the project. The progression of environmental compliance of the project could not be documented

because this information is not readily available to the public. The only documentation available is related to the EIA processes that were conducted as elaborated on in the analysis of the results.

Therefore, it is vital to engage with the notion that environmental compliance in the transport sector is still coming into fruition; there is a legislature that applies to the transport industry. However, the focus is not emphasized on the effect that the transport industry has on the environment and even human health. Ambient air measures are made, but it is often hard to trace the sources of the pollution from organizations when there are not enough monitoring officers or even the incorporation of environmental compliance audits that can be submitted to the relevant institutions.

The Rea Vaya BRT was a joint venture with the City of Johannesburg, and the department of transport. However, the Department of Transport has decided to become more environmentally conscious, through a partnership with the Department of environmental affairs as they have realised that the transport industry has a significant impact on the environment and needs to create sustainable avenues to restructure the transport system in South Africa. Based on this notion it is useful to include environmental compliance in the transport industry's environmental restructuring strategy. It can be a tool that is utilized to make the transport industry far more sustainable. Moreover this compliance feeds into not just public transportation but applies to individual motorists and freight transport on the roads too.

There is without a doubt some challenges that face the South African transport industry especially with regards to its environmental management and more especially environmental compliance. However, amongst these challenges identified in the thesis, there lies some opportunities. Opportunities for innovative policy design, and skills development in the environmental sector. The fragmentation between implementation o and the legislature is a matter pf urgency. There needs to be an institutional reorganization and the prioritization of environmental issues needs to be highlighted. There is lack of sufficient resource allocation and this is negatively affecting the ability for environmental compliance officers and other relevant environmental practitioners at the government level.

There are Alternatives to facilitate environmental compliance, one such an example is collaborative efforts which include various enforcement tools such as the reporting of non-compliant entities in the community. Moreover, there needs to be training and an increase in general capacity of environmental practitioners that deal with environmental compliance. Pursuing effective environmental compliance in South Africa is an avenue worth venturing on. There is a need public awareness campaigns that inform the general public about what their environmental rights are and how to ensure that they are not violated by anyone let alone a business entity.

Environmental compliance is an avenue for the pursuit of environmental sustainability. However, there needs to be a radical re-introduction of the values needed as an environmental compliance official to avoid any form of corruption. Furthermore, the purpose of environmental responsibility and accountability needs to be emphasized. In that sense individuals will incorporate a more conscious means of engaging with the natural environment.

6.3. Conclusions

The key findings mentioned have brought to the fore the importance of institutional restructuring which essentially entails that the purpose of an institution that speaks to environmental compliance needs to be made clear and redefined. Furthermore, the values that environmental practitioners carry are pivotal for the increase of environmental compliance adherence and environmental sustainability. Resources are essential for the maintenance of an environmental compliance system, staff and training are crucial. Therefore, the key findings have facilitated the structuring of the recommendations that could aid in creating inventory for the management of environmental issues and compliance.

6.4. Recommendations

The findings of this study the allowed for the creation of the following recommendations and steps as suggestions that could deal with the intricacies of environmental compliance and environmental sustainability in South Africa. First and foremost, environmental compliance needs to continue to develop as needed; it also needs to start attracting young, passionate environmental practitioners. These practitioners need to be focused on protecting the environment as their powers allow them too. Secondly, environmental legislation and policy need to resonate well on the ground as it does on paper or in theory. Institutional fragmentation needs to be progressively committed to changing.

Based on the findings associated with trying to understand the institutional frameworks that speak to environmental compliance it is evident that there needs to be a development in institutions of environmental compliance. There should be an emphasis on environmental compliance monitoring; this can be made mandatory through the creation of an environmental auditing institution. Furthermore, organizations should be obliged to have an environmental management plan and environmental management systems (Godwell and Inyang, 2011). There should be spontaneous routine visits to entities where compliance checks are made by compliance officers. As previously mentioned environmental compliance management systems are a progressive tool in the aid towards ensuring environmental compliance in organizations.

Environmental Compliance can be viewed as a valid tool for Environmental Sustainability. If done correctly and religiously. Environmental legislation is a means of conservation and protection of the environment because, without it, the environment would probably no longer function. Words on paper are great but what needs to be seen is the actions associated with the words. Therefore, every establishment needs to possess an environmental policy, which includes a plan of action. One needs to take into account that environmental compliance works hand in hand with environmental governance and environmental management.

Furthermore, in order to achieve environmental compliance, one should remember that the best approach is to take it one step at a time and to be consistent. The use of an environmental compliance management system is beneficial to every organization as it creates feasible compliance goals and allows for the minimization of risks to the organization and the environment. It is an approach that can be incorporate din its operational management where risk to the organization are managed or reduced. Moreover, each organization needs to incorporate a compliance officer to operate this system and keep records of compliance audits carried out. At

the moment these services are outsourced from private consultants, but considering that compliance checks should be done as regularly as a monthly basis, depending on the operations of the organization. This needs to be changed and an in house compliance officer is therefore necessary to minimise costs to the organization. Moreover, internal issues in an organisation can be the root of non-compliance. Therefore, significant suggestions that could help reduce non-compliance or improve it, besides the above mentioned include the following, the organisations need to develop an organisational culture that promotes, ethics and compliance with environmental law.

There also is a need for effective communication of environmental standards and procedures along with relevant training for all levels of the organisation; this would typically include the board, management and employees too. The necessary compliance monitoring and reporting tools need to be incorporated in the compliance management system and lastly, a value system that allows incentives for those that comply and contribute to compliance objectives may be introduced and significant enforcement may be used as a disciplinary mechanism. There are a few crucial steps that can be taken in order to create ways to work towards being more environmentally compliant as mentioned an increased environmental awareness through environmental education is required. Furthermore, strengthening environmental regulatory institutions is pivotal to the prioritization of environmental compliance in South Africa. Environmental institutional frameworks need to be revisited and their nature ans structures need to be strengthened so as to create fluidity in the compliance process by organizations.

Therefore, environmental compliance deeply rooted in environmental management and has been argued to be an aid in environmental sustainability. However, it still has a long way to advance typically in South Africa. Nevertheless, there have been some significant strides that have been made in its advancement as mentioned in the dissertation. This, therefore, conveys a sense of hope that more innovative methods to ensure compliance are produced at the various levels of authority. The environment is a source of various essential elements for the survival of mankind, and it would be useful for mankind to comprehend that without the environment there is no mankind. Therefore, we need to commit ourselves to finding the most environmentally just way to develop, so as to allow for subsequent generations to also thrive.

The environment is rapidly being degraded by anthropogenic activities, therefore a more conscious means of developing will allow for this environmental injustice to dissipate. On a concluding note, environmental compliance requires more research and dedicated environmental practitioners to advocate for the interest of the voiceless environment. Moreover, the social implications such as the destruction of natural resources that communities depend on have destructive effects. They perpetuate the vicious cycle of poverty as much of the people who directly depend on the natural environment for survival are the poor. Socio economic differences have a direct link with how individuals engage with the idea of environmental sustainability. The legal tool for compliance enforcement was created to minimize crimes against the environment but the lack of honesty and stringent enforcers has allowed for loop holes in the legal system. It is without a doubt, much of the world's problems are rooted in the result of the differences between how nature operates and the manner in which people think. Companies have to realize that environmental compliance is part and parcel of the functioning system of the company if a company chooses to reject the environmental implications their activities have, they are defeating the ideal existence

of the notion of humanity. In the near future, we hope the voiceless environment will continue to get institutions and practitioners that advocate for sustainable development. For without the environment there is no point in the existence of the human race.

References

Adebayo, W. O., Jegede, A. O. and Ogundele, J. A. 2015. Environmental Laws in Nigeria: Negligence and Compliance on Road transportation Land use planning pattern in South-South Geo-Political Zone. Dannish Journal of Law and Conflict Resolution, 1(30), 18-28.

Adegoke, A. 1994. The Challenges of Environmental Enforcement in Africa: The Nigerian Experience. *Third International Conference on Environmental Enforcement,* 43-54.

Agbazue, V. E., Anih, E. K. and Ngang, N. U. 2017. The Role of NESREA Act 2007 in Ensuring Environmental Awareness and Compliance in Nigeria. Journal of Applied Chemistry, 10(9), 32-37.

Barrett, F. J., Powley, E. H. and Pearce, B.2011. Hermeneutic Philosophy and Organizational theory. *Research and Sociology of Organizations*.

Barrow, C.J. 2005. *Environmental Management and Development*. Routledge, London.

Brandford, A. 2017. Empirical Evidence: A Defintion. Live Science.

Available from: http://www.livescience.com/21456-empirical-evidence-a- defintion.html.

Berry, M.A. and Rondinelli. 1998. Proactive Corporate Environmental Management: A New Industrial Revolution. *Academy of Management Executive*, 12(2), 38-50.

Block, M. R. 2001. Standards outlook: ISO 14001 and Regulatory Compliance.

Available from: http://asq.org/quality-progress/2001/02/Standards-outlook/iso-14001-and-regulatory-compliance.html

Bowen, G.A. 2009. Document Analysis as a Qualitative Research method. *Qualitative Research Journal*, 9(2), 27-40.

Carlough, L. 2004. General Deterrence of Environmental Violation: A Peak into the Mind of the Regulated Public. State of Oregon Department of Environmental Quality. Oregon, USA.

Chinelo, I. 2016. *Fundamentals of Research Methodology and Data Collection*. Lambert Academic Publishing.

Chompunth, C. 2013. Public Participation in environmental Management in Constitutional and Legal Frameworks. *Journal of Applied Sciences,* 10(1), 73-80.

Cohen, L., Manion, L. and Morrison. 2000. Research Methods in Education (5th ed.). London: Routledge Falmer.

CoJ. 2015. Transport Management Plan. Eco-Mobility World Festival. Johannesburg South Africa.

Compton, P., Devuyst, D., Hens, L. and Nath, B. 2013. Environmental Management in Practice: Managing the Ecosystem. Routledge, UK.

Cory, T. and Green. M. R. 2017. The Cost of Environmental Non-compliance. Environmental standards.

Available from: http://www.envstd.com/the -cost-of-environmental-non- compliance.html

Cortez, X. A, 2016. *Primer on environmental compliance certificate in accordance with the environmental impact statement system, its nature, coverage, corresponding requirements, and current accessibility*. XC Legal Primers, Philippines.

Crouch, M. and McKenzie, H. 2006. *The logic of small samples in interview based qualitative research*. The Social science information. 45(4), 438-499.

Daley, H. E. 1990. Toward some operational principles of sustainable development *Ecological Economics* 2, 1-6.

Dean, B. A. The Interpretivist and the Learner. *International Journal of Doctoral Studies*,13, 1-8.

Delfin, I. 2013. What is Environmental Compliance? Sustainable business toolkit.

Available from: http://www.sustainablebusinesstoolkit.cpom/what-is- environmental-compliance/

Deloitte, 2009.Ethics and Compliance: The Advantage of a value-based approach. Deloitte, India.

Department of Environmental Affairs (DEAT). 2015. *National Environmental Compliance and Enforcement Report* 2014-15. DEA, South Africa.

DEA. 2011. *Sustainability in South Africa: 2nd South Africa Environment outlook*. DEA, South Africa.

DEAT. 1996. *Green paper on an Environmental Policy for South Africa*. DEA

DEAT. 1997, *White paper on Environmental Management Policy*, DEA.

DEAT. 2004. *Overview of Environmental Management*, Integrated Environmental Management, Information Series. DEAT, Pretoria.

Department of Environmental affairs and Tourism (DEAT). 2008. *Environmental implementation and management plan (EIMP*). DEAT, South Africa.

Department of Transport (DoT). 2014. Green Transport Strategy (2016-2021). DoT, South Africa.

European Commission (EC). 2018. EU Action to Improve Environmental Compliance and Governance. European Commission, UK.

Edo, Z. O. 2012. The Challenges of Effective Environmental Enforcement and Compliance in the Niger Delta Region of Nigeria. *Journal of Sustainable Development in Africa*, 14, (6), 261-276.

Edwards, R. and Holland, J. 2013. *What is Qualitative interviewing?* Bloomsbury, London.

EPA. 2016. *Environmental Management Systems (EMS) - March 2017*. USA EPA. Available from: http://www.epa.gov/ems, accessed 28 July 2017.

Failler, P., Karani, P. and W. Seide. 2016. Assessment of the Environmental Pollution and its Impact on Economic Cooperation and Integration Initiatives of the IGD Region- National Environment Report- Kenya. Technical Report.

Fakier, S., Stephens, A. and Tholin, J. 2005. *Background research paper: Environmental governance: South Africa Environment outlook*. DEAT, 1-35.

Fitzmaurice, M. Environmental Compliance Control. *Wroclaw Review of Law*,8(2), 372-394.

Fraser, S. 1997. *Environmental sustainability: Practical Global Implications*. CRS Press, Florida, USA.

Feris, L. 2006. Compliance Notices- A new tool in Environmental Enforcement. *P.E.R Journal*, 9(3), 53-70.

Fuggle, R.F. 1990. Integrated Environmental Management: An Appropriate Approach to Environmental Concerns in Developing Countries. *Impact Assessment Journal*, 8(2), 29- 45.

Gentles, S. J., Charles, C., Ploeg, J. and Mc Kibbon, K. A. 2015. *Sampling in qualitative research: Insights from an overview of the methods literature*. *The qualitative repor*t, 20(4), 1772-1789.

Gerardu, J. Mulkey, M. and Pink, G. 2015. Next Generation Environmental Compliance and the Future. *International Network for Environmental Compliance and Enforcement*, 1-23.

Glazewski, J. 2009. *Environmental Law in South Africa*, 2nd ed. Lexis Nexus, South Africa.

Godwell, N. and Inyang, E. 2011. Framework and Tools for Environmental Management in Africa. *Council for the Development of Social Science Research in Africa*.

Goondiwala, Z. 2014. The Rea Vaya Bus Rapid Transit (BRT) Project. *Ideas that Work: The South African Public Sector Innovation Journal*, 5(1).

Grutter, J. M. 2011, *BRT Rea Vaya Phase 1A and 1B, South Africa*. Grutter Consulting, Switzerland.

Hayha, L. 2014. *China's Economic, Environmental and Social Development in Crossfire – Province Specific Analysis of China's Ecological Modernization and Sustainability*. University of Jyvaskyla.

INECE (2009) Principles of Environmental Compliance and Enforcement Handbook. International network for Environmental Compliance and Enforcement, USA.

Jenkins, W. 2009. Sustainability Theory: The Spirit of Sustainability, 1st ed., Berkshire encyclopaedia of Sustainability, 390-384.

Jones, G. 2004. *People and Environment: A Global Approach*. Pearson Education Limited, England, Essex.

Kirchherr, J., Charles, K. and Guetterman, T. C. 2018. Enhancing the Sample Diversity of Snowball Samples: Recommendations from a Research Project on Anti-Dam Movements in Southeast Asia. *Plos One*, 13(8), 1-17.

Kitchin, E. and Tate, N. J. 2000. *Geography: Theory, methodology and practice*. Pearson Education limited, England.

Keating, M. 1992. Earth Summit Times September 1992, Centre for our common Future, Switzerland.

Kebin, H. and Chang, C. 1999. Present and Future Pollution from Urban Transport in China. China Environment Series.

Khan, M. I. and Chang, Y. 2018. Environmental Challenges and Current Practices in China – A Thorough Analysis. *Journal of Sustainability*, 10, 25-47.

King, M. and Lessidrenska, T. 2009. *Transient Caretakers: Making Life on Earth Sustainable*. Pan Macmillan, Johannesburg.

Kulkarni, V. and Ramachandra, T.V 2006. Environmental Engineering Series: Environmental Management. TERI Press, New Delhi.

Lester, S. 1999. *An introduction to Phenomenological Research*. Stan Lester developments, Tauton, UK.

Available from:

http://www.sld.demon.co.uk/resmethy.pf

Lloyd, P.J. 1994. Environmental Protection in South Africa. *The Journal of the South African institute of mining and metallurgy*, 111-118.

Machette, E. M. 2011. *The Causes and impacts of water shortage Households of Ga-Kgopane Township in the Limpopo Province*. University of Limpopo, South Africa.

Maguire, M. and Delahun, B. 2017. Doing a Thematic Analysis: A Practical step by step Guide for learning and Teaching Scholars. *CAISHE*-J, 3, 551-576.

Malvestio, A. C., Fischer, T. B. and Montano, M. 2018. The Consideration of Environmental and Social Issues in Transport Policy, Plan and Programme making in Brazil: A Systems Analysis. *Journal of Cleaner Production*, 179, 674-689.

Momtaz, S and Kabir. Z. 2013. *Evaluating Environmental and Social Impact Assessment in Developing Countries*. Elsevier, Amsterdam.

Mautherner, M. L., Birch, M., Jessop, J. and Miller, T. 2002. *Ethics in Qualitative Research*. Sage Publications, London.

Michalak, K. and Mazur, E. 2006. *Environmental Compliance and Enforcement in China: An Assessment of Current Practices and Ways Forward*. OECD, Vietnam.

Middleton, J., Goldblatt, M., Jackoet, J. and Palmer, I. 2011. *Environmental Management and local Government*. PDG Occasional paper, 5.

Ministry of Environment, Water and Natural Resources (MEWNR). 2013. *National Environment Policy*. MEWNR, Nairobi.

Morelli, J. 2011. Environmental sustainability: A definition for environmental professionals. *Journal of environmental sustainability*, *1*(2), 1-10.

Mothe, G. A. Sthel, Pele Castro, M. S., Toledo, R., Stumbo, A., Gomes, M. Esquef, I. and Vargas, H. 2014. Air pollution in the Brazilian Road Transport and it's Environmental and Social Consequences. *Journal pf Environmental Protection*, 1466-1476.

Natural Resources Defence Council (NRDC). 2010. *Effective Environmental Compliance and Governance: Perspectives from NRDC*, New York.

NECER, DEA. 2012. *National Environmental Compliance and Enforcement Report*. DEA, South Africa

NECER, DEA. 2016. *National Environmental Compliance and Enforcement Report*. DEA, South Africa.

NEMA. 1998. National Environmental Management Act 107 of 1998, DEA.

NPA. 2014. About the NPA. NPA

OECD. 2006. *Environmental compliance and enforcement in India: Rapid assessment*. OECD, New Delhi.

OECD. 2006. Environmental Compliance and enforcement in China: An Assessment of Current Practices and Ways Forward. OECD, China.

OECD. 2008. The Environmental Impacts of Increased Intervention Road and Rail Freight Transport; Past Trends and Future Perspectives. OECD, Mexico.

Ogola, P. F. A. 2007. *Environmental Impact Assessment General Procedures*. United Nations University and Kenya Electricity Generating Co. Ltd, Kenya.

Open University. 2012. Sustainability: The Geography Perspective.

Available from`; http://openlearn.open.ac.uk/mod/oucontent/view.php

Patel, Z. 2009. Environmental Justice in South Africa: tools and Trade-offs. *Social Dynamics*, 35 (1), 94-110.

Phalatse, P.H. 2012. *Innovating Knowledge in the City 2011-2012: City of Johannesburg case studies.* City of Johannesburg, South Africa.

Peluso. N. 2012. What's nature got to do with it? A situated historical perspective on socio-natural commodities. *Development and change*, 43(1), 79-104.

Petts, J. 2009. *Handbook of Environmental Impact Assessment: Impact and Limitations in Practice*. John Wiley and Sons, UK.

Raje, F., Tight, M. and Pope, F.D. 2018. Traffic Pollution: A Search for Solutions for a City like Nairobi. *Cities Journal*, 82, 100-107.

Rea Vaya. 2017. The Rea Vaya BRT.

Available from:

https://www.reavaya.org.za/

Ridley, D. 2013. Literature Review: A Step by Step Guide for Students. Sage, Los Angeles.

Rodrigue, J., Comtois, C. and Slack, B. 2017. *The Geography of Transport Systems*. Routledge, New York.

Sadler, B. 1996. Environmental Assessment in a changing orl: Evaluating practice to Improve Performance, International Study on the Effectiveness of Environmental Assessments, Canadian Environmental Assessment Agency and the International Association for Impact Assessment, Canada.

Saunders, M. Lewis, P. and Thornhil, A. 2012. Research Methods for Business Students. Pearson Education Limited, UK.

Saunders, B., Sim, J. Kingstone, T., Baker S., Waterfield, J., Bartlam, B. and Burroughs, H. 2018. Saturation in Qualitative Research: Exploring its Conceptualization and Operationalization. *Qual Quant*, 54(4), 1893-1907.

Schlosberg, D. 2001. Three *Dimensions of Environmental and Ecological Justice*. European Consortium for Political Research, France.

Sheldon, C. and Yoxon, M. 2006. *Environmental Management Systems: A step-by-step guide to Implementation and Maintenance*. Earthscan Publications, UK.

Swedish Environmental Protection Agency (SEPA). 2002. *Environmental Impact from Different Modes of Transport – Methods of Comparison*. SEPA, Sweden

Sharma, R.K and Kumar, S. 2012. Impact of Transportation System on Environment in Developing Countries. International Journal of Research Review in Engineering Science and Technology, 1(2).

Soon, W., Baliunas. S. L., Robinson, A. R. and Robinson, Z. W. 1999. Environmental effects of Increased Atmospheric Carbon Dioxide. *Climate Research*, 13, 149-164.

Stebbins, R.A. 2001. Research in the Social Sciences. Sage, London.

Strydom, H. A. and King, N.D. 2009. *Environmental Management in South Africa*. Juta and Company Ltd, South Africa.

Tarantino, A. 2007. *Governance, Risk and Compliance Handbook: Technology, Finance, Environmental, and International Guidance and Best Practices*. John Wiley and Sons, Inc. New Jersey.

Thanh, N. C. and Thanh, T. L. 2015. The Interconnection Between Interpretivist Paradigm and qualitative Methods in Education. *American Journal of educational science*, 1(2).

Trumbull, N. and Bae, C. 2000.Transportation and Water Pollution.

Available from:

http://courses.washington.edu/gmforum/topics/trans_water/trans_water.htm

Van Wyk, J. 2007. The Impacts of Development on the Environment as part and parcel of Integrated Development Planning. Law *Democracy and Development*, 1, 57-80.

Walsh, M. P. 1999. Transportation and the Environment in China. *China Environment Series*, (3), 28-37.

Wang, L. 2010. The Changes of China's Environmental Policies in the Latest 30 years. *Procedia Environmental Sciences,* 2, 1206-1212.

Willis, J. W. 2007. Foundations of Qualitative Research: Interpretive and Critical Approaches. Sage Publications

Wolf, T. and Menne, B. (eds). 2007. *Environment and Health Risks from climate Change and Variability on Italy*. World Health Organization (WHO), Denmark.

World Health Organization (WHO). 2000. Transport, Environment and Health. *WHO Regional Publications, European Series*, 89

Yilmaz, S. 2010. State, Power and Hegemony. *International Journal of Business and Social Sciences*, 1(3).

Yiqi, L and Moonley, H. A. 1999. *Carbon Dioxide and Environmental Stress*. Academic Press, California, USA.

Yulin, J. and Liguang, F. 2006. Current status of Transport- Related Energy Consumption, Land taken and Environment in China in Transport- Resource and Environmental Issues in China. World Transport Policy and Practice, 12.

Zhang, B., Bi, J., Yuan, Z., Ge, J., Liuand, B. and Bu, M. 2008. Why do firms engage in environmental management? An empirical study in China. *Journal of cleaner production,* 1036-1045

Appendix 1: List of Interviews Conducted

Respondent #1: Black Male, Date: 31/05/2018, venue: CoJ Johannesburg.

Respondent #2: White female, Date: 31/05/2018, Venue: COJ Johannesburg.

Respondent #3: Black male, Date: 31/05/2018, Venue: CoJ Johannesburg

Respondent #4: Black female, Date: 1/062018, Venue: CoJ Johannesburg

Respondent #5: White female, Date: 01/06/2018, Venue: CoJ Johannesburg

Respondent #6: White Male, Date: 01/06/2018 Venue: CoJ, Johannesburg

Respondent #7: White male, Date: 5/06/2018, Venue: Johannesburg

Respondent #8: Black female, Date: 7/06/2018, Venue: Johannesburg

Respondent #9: Black female, Date: 7/06/20018, Venue: Johannesburg

Respondent #10: Black female, Date: 8/06/2018, Venue: Pretoria

Respondent #11: Black male, Date: 11/06/2018, Venue: Johannesburg

Respondent #12: Black male, Date: 12/06/2018, Venue: Johannesburg

Respondent #13: Black female, Date: 23/06/2018, Venue: Johannesburg

Respondent #14: Black female, Date: 25/062018, Venue: Johannesburg

Respondent #15: Black male, Date: 28/06/2018, Venue: Johannesburg

Respondent #16: White Female, Date:28/06/2018, Venue: Johannesburg

Respondent #17: White male, Date: 2/07/2018, Venue: Johannesburg

Respondent #18: White female, Date: 3/07/2018, Venue: Johannesburg

Respondent #19: Coloured female, Date: 10/07/2018, Venue: Johannesburg

Respondent #20: White male, Date: 11/07/2018, Venue: Johannesburg.

Appendix 2: Interview Schedule

Interview Schedule:

Title of Research: "Environmental Compliance and Sustainability: A study of the transport Industry in Johannesburg."

Introduction:

I have been requested by the University of the Witwatersrand to conduct a research study for the School of Geography, Archaeology and Environmental studies. Please be assured that no local authority or individual will be named in the report and nothing will be linked back to you the interviewee. Therefore, everything you tell me will be treated as confidential. However, if you do tell me something that may lead me to believe that you/or someone is at risk of physical /or emotional harm, I will have to pass this information to my supervisor.

The interview should take around 45 minutes. Please note that you are welcome to withdraw from the interview at any point if you wish too.

Do you have any questions before we start with the interview?

Just to aid me in my note taking are you comfortable with me recording our conversation?

Okay before I formally begin the interview I just want to inform you of the topics that we will be covering, these are namely: Background information on you, institutional frameworks of environmental compliance, legal frameworks of environmental compliance, social and environmental aspects of environmental compliance, and the aim of environmental compliance. These will all be under the umbrella of the transport industry.

Questions

Topic: Background:

1. Could you please in a few words tell me what environmental compliance entails?
2. Please can you briefly outline your job role and responsibilities?
3. *How long have you been in your current role?*
4. *Why did you choose to go into environmental compliance?*
5. What values and attitudes do you think an environmental compliance officer should possess?

Topic: Environmental compliance Institutional frameworks

1. What are the environmental compliance institutions currently in place for the transport industry?
2. How do you feel about these current institutions?
3. Does public participation play any role in the environmental compliance?

Topic: Environmental compliance Legal frameworks

1. What is the legal environmental compliance measures associated with the transport industry?
2. How are these legal measures enforced and who does this?

3. How effective are the penalties for non-compliance to environmental legislature?
4. Do you get instances where some companies who have not successfully complied with environmental regulatory rules and legislature have attempted to bribe officials?
5. What would you say are the overall challenges identified with environmental compliance in the transport industry?

Topic: Environmental Sustainability

1. What does environmental sustainability mean to you?
2. What role does environmental compliance play in promoting environmental sustainability or sustainable development?
3. How do you feel about the state of environmental sustainability in South Africa?

Topic: Environmental Management

1. In your opinion what are the benefits and challenges of environmental management?
2. How do you feel about environmental compliance being used as a tool in environmental management?

Other Questions:

1. How do you see environmental compliance developing further in the future?
2. What suggestions or advice would you give to state officers, local authorities, or companies regarding environmental compliance in the transport industry?

Do you have any questions or anything you would like to add to your responses?

Thank you very much for participating in this research. Once the research has been published, we will send you a copy.

Please could I check that I have your correct contact details?

Appendix 3: Consent Form



UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Consent form

Title of Research project: "Environmental compliance and environmental sustainability in South Africa: A study of the Transport Industry in Johannesburg".
Researcher: Rachel N. Tshiunza M.Sc. Geography and Environmental Studies

	Please indicate	
1. I confirm that I have read and have understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions, and have had these answered sufficiently.	Yes	No
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected.	Yes	No
3. I understand that, I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish.	Yes	No
4. I agree to take part in the above study	Yes	No
5. I agree that my participation in the study will remain anonymous	Yes	No
6. I agree that the interview may be audio recorded.	Yes	No
7. I agree that the researcher may use anonymous quotes in her research report.	Yes	No

.....	.....	.....
Participant Name	Date	Signature

Appendix 4: Participant Information Sheet



UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Participant information sheet:

Research title: "Environmental compliance and environmental sustainability in South Africa: A study of the transport industry in Johannesburg"

Good day, my name is Rachel Tshiunza and I am a Masters Geography and Environmental Studies student at Wits University. As a requirement for my studies I have to undertake a research project. The purpose of the research project is to investigate the dynamics of Environmental compliance and its relationship with Environmental sustainability in South Africa.

As part of the research project, I would like to invite you to partake in an interview. This activity will involve answering a few questions and will take around 30 minutes. The interview will be conducted by me. With your permission, I would like to record the interview for the purpose of data analysis. You will receive no direct benefit from participating or disadvantages for not participating. You may withdraw from the interview at any stage or not answer any question if you do not want to. The interview will be completely confidential and anonymous as I will not ask for your name or any identifying information and the information you give me will be held securely and not disclosed to anyone besides my supervisor. I will be using a pseudonym (False name) to represent your participation, in my final report. If you experience any discomfort or distress the interview can stop or resume another time.

If you have any questions afterwards or require any clarity, please feel free to contact me on the details below. This study will be written up in the form of a report and will be made available online through the university library website. Should you require a copy of this report I will be happy to provide you with one upon request. If you have any queries, concerns, regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (non-medical), telephone + 27(0)11 717 1408, email hrec-medical.researchoffice@wits.ac.za/ Shaun.Schoeman@wits.ac.za .

Yours Sincerely,
Rachel N. Tshiunza

Rachel Tshiunza, 542341@students.wits.ac.za , 0792851425.

Prof. Danny Simatele, danny.simatele@wits.ac.za , 0833836884.