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INYUVESI YAKWAZULU-NATALI

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Environmental Pollution and Climate Change: An Ethical Interrogation of the Payment of Carbon Tax as a Means to Reduce Greenhouse Gas Emission in South Africa

ZAMA NONKULULEKO MASONDO
216046979

Supervisor: Dr Beatrice Okyere-Manu

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Zama Nonkululeko Masondo
(Student No.: 216046979)

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(Supervisor)

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Dedication

To my late mother, Girly Nester Mdunge-Masondo. My guardian angel.

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I am especially grateful to God. I thank the Lord for giving me strength and power to be able to keep on pushing and believing. I have always kept the faith and I know that I can do all things through Christ as he gives me strength. I would not have completed this study it if was not for you God.

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Abstract

Climate change and environmental pollution are the main environmental issues affecting the world's ecosystem including that of South Africa. They cause poverty, land degradation, waste and littering, health hazards and urbanisation. One of the main causes of climate change and environmental pollution is carbon emissions into the atmosphere. As a way to curb these emissions carbon tax policies have been introduced in several countries and South Africa is one such country. A carbon tax aims to reveal the actual costs of carbon emissions for the betterment of the country and, crucially, the environment. In South Africa, the idea of a carbon tax has been under discussion since 2010 and in 2019, the Carbon Tax Act was signed into law by the president of South Africa, Cyril Ramaphosa. This was due to the fact that carbon is recognised as one of the major contributing factors to the issue of environmental pollution and climate change. Carbon emissions do not only affect the environment but also the economy and society. If effectively applied a carbon tax will raise revenues whilst at the same time reduce carbon dioxide emissions.

Both prior and subsequent to the introduction of the carbon tax policy, there has been debate and discussion on its effect on the environment, the economy and the society. Based on the debate and discussion thus far, I noticed that most of the scholars who have written on carbon tax have focused more on the economic implications of the tax on South Africa as opposed to the tax's ethical implications. Thus, this dissertation contributes to the debate and discussion by evaluating the South African carbon tax policy through the lens of the ethical theories of sustainable development and environmental stewardship.

Key Words: Carbon tax (Policy), Environmental pollution, Climate change, Greenhouse Gas, Carbon emissions, Environmental ethics, Sustainable development, Environmental stewardship.

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Abbreviations and Acronyms

CO2	Carbon Dioxide
CPI	Customer Price Index
DEA	Department of Environmental Affairs
GHGs	Greenhouse Gases
IUCN	International Union for the Conservation of Nature
NDC	Nationally Determined Contribution
NEMA	National Environmental Management Act
NFSD	National Framework for Sustainable Development
SARS	South African Revenue Service
SD	Sustainable Development
UNFCCC	United Nations Framework Convention on Climate Change
UNSDG	United Nations Sustainable Development Goals
WWF	World Wide Fund for Nature

Chapter One

Introduction

1.0. Introduction

This study is an ethical evaluation of carbon tax (policy) as a means to reduce greenhouse gas (GHG) emissions. The idea of a carbon tax in South Africa has been discussed since 2010. In 2019 the president of South Africa, Cyril Ramaphosa, signed the Carbon Tax Act into law (Government of South Africa 2019). This was done in light of carbon being one of the major contributing factors to environmental pollution and climate change. Furthermore, carbon emissions do not only affect the environment but also the economy and society.

This chapter introduces the study. It starts with the background to and motivation for the study. This is followed by the research problem, key research question, research sub-questions, key objective, research sub-objectives, a brief overview of the theoretical framework adopted, and the research method and methodology used. The chapter ends with an outline of the structure of the dissertation and a conclusion.

1.1. Background

According to the OECD: South Africa Environmental Performance Review, "South Africa is one of the world's top 20 emitters of greenhouse gases (GHGs)… the energy sector is the largest, and growing, source of CO2 emissions, reflecting the coal-dominant structure of energy (74%) and electricity supply (94%) and the under-pricing of this fossil fuel" (2013: 4). The emissions are the main contributors to the environmental ethical issues of climate change and environmental pollution. The different types of environmental pollution include water, air, noise, thermal and land. Which cause damage to both renewable and non-renewable environmental resources. Sustainability of these resources is important not only to benefit the present generation but future generations as well. While the government and policymakers are there to present us with guidelines (which are more theoretical in nature), it is up to us, the people, to put them into practice so that the environment can be protected.

Climate change is a global ethical issue, which is a threat to human life and the planet. The primary factor behind the issue of climate change is the increase of global carbon emissions (Huisingh *et al*. 2015: 2). In response, countries like Sweden, Canada and France introduced carbon tax as a measure to curb climate change and environmental pollution by decreasing carbon emissions (Criqui *et al* 2019: 628). South Africa, as with many other countries, emits GHGs into the atmosphere thereby causing environmental pollution and climate change. South Africa depends on coal for most of its energy (Snyman and Botha 1993: 172-178) and the burning of coal produces gasses that cause damage to the atmosphere, which in turn damages the environment. Thus, as a way of curbing and remedying the damage, the idea of a carbon tax was introduced in 2010.

In 2015, the then Minister of Environmental Affairs, Edna Molewa, signed the Paris Agreement on Climate Change on behalf of the South African government. The core purpose of the Paris Agreement is to decrease the global temperature by two degrees celsius and, at the same time, limit the increase by one point five degrees Celsius (Environmental affairs 2016: 1). South Africa submitted its intended nationally determined contribution (NDC) to the Paris Agreement. The NDC highlighted what the country intended to do and its long-term goals with regard to the issue of climate change (Government Gazette 2019: 13). The NDC stressed climate change mitigation, adaptation, finance and investment for COP 19 and 20 (Conference of the Parties).

As noted above, the president of South Africa, Cyril Ramaphosa, signed the Carbon Tax Act into law in 2019. The law came into effect on the 1st of June 2019 (Government of South Africa 2019). The main objective of the carbon tax policy in South Africa is "to reduce the greenhouse gases (GHGs) emissions in a sustainable, cost-effective and affordable manner" (National Treasury 2019: 1). The policy serves as a guideline for environmental pollution, and it also takes into cognisance the importance of the environment. It serves as a guide for carbon emitters to limit their emission of carbon into the environment and the atmosphere. This creates awareness among firms of the need to use more clean, suitable and sustainable technologies that will not be harmful to the environment. The policy makes provision for a penalty in the form of a fine for companies or individuals that transgress the policy by emitting carbon into the environment.

According to the African News Agency, the carbon tax policy puts into effect the principle of "polluter pays" and in so doing companies and consumers will need to take into consideration the negative adverse costs associated with carbon emissions in their future production, consumption and investment decisions (2019: 2). The carbon tax policy thus stems from the "polluter pays principle" which states that an individual is responsible for the damage he/she causes to the environment. To this end, the carbon emitters or offenders are legally bound to pay for the carbon released. They are thus held accountable and fined according to the amount of carbon that they release into the environment. In other words, one will have to pay should one not adhere to the policy. This dissertation will, therefore, interrogate the ethical implications of the payment of a carbon tax as a means of reducing GHG emissions thereby moving towards a sustainable environment in South Africa.

1.2. Motivation for the study

This study was inspired by the passion I have, since my early childhood, for nature. As the years go by, we keep on experiencing environmental catastrophes which result in climate change and environmental pollution. Some of these changes are a result of anthropocentric actions, which affect not only us but also future generations. Environmental pollution and climate change do not only affect weather patterns or air quality in South Africa but also, among other aspects, vegetation, geology, soil, rain patterns and marine life. I have always had this thought of how we can stop or mitigate activities harmful to the environment which, in turn, would benefit the environment, the economy and us as part of society. I have also recognised that while we in South Africa do have policies that protect the environment, they are just theoretical rather than practical. When reading about the carbon tax policy, I thought that there were some ethical issues relating to the policy that I could interrogate. This intention (and the study) needs to be seen in the light of one of the primary purposes of ethics, namely, to "give reasons with regards to how the world should/must be and guides people on how they should handle themselves within this cosmos" (Vardy and Grosch 1999: 220).

1.3. Research Problem

Since the introduction of a carbon tax policy in South Africa, there have been various debates and discussions on its effect on the economy and its aim to reduce carbon emissions into the atmosphere. The debates and discussions are on the literature surveyed, it is evident that most of the scholars who have written on the policy have focused more on its economic implications for the country. The current study contributes to the debate by evaluating the policy through the lens of the theories of environmental stewardship and sustainable development. In doing so ethical questions are asked and these include: Is the policy able to curb environmental pollution? Does the policy help the contributor or emitters to be stewards of the environment? Is it right for companies to pay for damage done to the environment, what about individuals and communities? How does the money paid repair the environment and who determines how much is to be paid? Does payment correct the individual's actions or anthropocentric behaviour?

1.4. Key Research Question

What are the ethical implications of the payment of a carbon tax as a means of reducing GHG emissions thereby contributing to a sustainable environment in South Africa?

1.5. Research Sub-questions

1. What is environmental pollution?
2. What are the consequences of environmental pollution?
3. Can carbon tax curb environmental pollution?
4. How can environmental stewardship and sustainable development strengthen the carbon tax mechanism and thus contribute to the sustainability of the environment?

1.6. Key Objective

To ethically evaluate the effects of a carbon tax policy as a means of reducing GHG emissions thereby contributing to a sustainable environment in South Africa.

1.7. Research Sub-objectives

1. To define environmental pollution.
2. To examine the consequences of environmental pollution.
3. To explore how environmental stewardship and sustainable development can strengthen the carbon tax mechanism and thus contribute to the sustainability of the environment.

1.8. Research Method and Methodology

This study, which is focussed on South Africa, is qualitative in nature and based on existing literature. In conducting the study, I used the library or desktop research method to obtain information. In terms of the research methodology, the study used a descriptive and explorative design to address the research questions. This is explained below.

1.8.1. Data Collection Method

This study comprised desktop research based on secondary sources. David Travis asserts that "desktop design is using other people's work; it is reviewing previous research findings to acquire a better understanding of the field". [1] The reason for choosing a desktop study is due to the issue of the global Corona Virus (COVID-19) pandemic the study depended on unpublished and published sources mainly originating from case studies, dissertations, theses, books and journals articles. Resources such as ResearchGate, Google Scholar and Sabinet were used to identify and retrieve sources. Information retrieved from the sources was categorised into relevant themes and sections thereby making it easier for the researcher to analyse and present.

The study is organised according to themes. This is due to the fact that scholars have written from different perspectives and the ones that are closely related are placed in the same section. For instance, scholars that explained and described carbon tax are in one section, whereas scholars who have written about environmental pollution or climate change, for

[1] https://www.userfocus.co.uk/articles/desk-research-the-what-why-and-how.html

instance, have been arranged according to their ideas. The process is vital as it assists the researcher to classify the main problems concerning a phenomenon. The thematic arrangement is also important for the process of data analysis. It is at this point that the theories of sustainable development and environmental stewardship are used as a lens to ethically interrogate carbon tax as a means to reduce GHG emissions in South Africa. Furthermore, the secondary data presented me with a starting point for gathering literature for my study. Having identified the research problem and formulated the key research question, the study was heavily dependent on secondary data.

1.8.2. Methodology

The research methodology, according to Thomas Schwardt, is how an investigation should proceed (2007: 195). This study used a descriptive and explorative design. The descriptive approach helped express causality or different speculations about the subject of the study. Descriptive research is "is based on the premise that problems can be solved, and practices improved through observation, analysis, and description" (Koh and Owen 2000: 278; Streubert and Carpenter 1999: 49). In addition, Catherine Marshall and Gretchen Rossman state that descriptive research is conducted to "document the phenomenon of interest in the real situation" (1995: 49). With this design I was able to research what other scholars have written about, and what is missing with regard to, the issues of climate change and environmental pollution as well as get more information on the carbon tax policy.

The second research design used was exploratory. Nancy Burns and Susan Grooves define exploratory research as a type of research commonly conducted to attain new understanding and develop new perspectives of a phenomenon, and to increase existing knowledge regarding a phenomenon (2001: 374). This suggests that an exploratory design in research is used to investigate and have a better understanding of an existing problem. This study used the exploratory design to obtain new information on whether a carbon tax is an effective mechanism to respond sustainably to the current environmental crisis caused by GHG emissions. Through the use of the exploratory design, I ethically evaluated the carbon tax policy to determine if it would aid in curbing the issues of climate change and environmental pollution on a sustainable basis. Use of this design was helpful in the sense that it worked

well with the theory of environmental stewardship in finding resources to strengthen the existing mechanism's response to environmental pollution.

1.9. Theoretical Framework

Climate change and environmental pollution are some of the most pressing environmental issues in South Africa. The carbon tax policy is used as a mechanism to boost the economy, conserve the environment and cater for society on a sustainable basis. For that reason, the theoretical framework that guided this study consisted of the ethical theories of environmental stewardship and sustainable development. They will be elaborated more in chapter four.

The theory that reinforced this study, particularly from an ethical perspective, is the ethical theory of environmental stewardship. The topic of environmental stewardship entered public consciousness in the middle of the last century in the works of scholars such as Aldo Leopard (*A Sand Country Almanac 1966*), Garret Hardin (*The Tragedy of the Commons 1968*), and Rachel Carson (*Silent Spring 1962*). The importance of the ethical aspects of environmental stewardship is that they provide an explicit, rational and moral underpinning for our treatment of natural resources and the natural world.

This theory was useful for the study because it tackles the anthropocentric mentalities that humans have of the environment. That is, it interrogates the moral responsibilities that humans have for the environment and the importance of sustainability. Clare Palmer analyses some weaknesses of the theory and states that, "stewardship of the natural world, whether Christian or otherwise ... remains profoundly anthropocentric and un-ecological, legitimating and encouraging increased human use of the natural world" (2006: 75). This means that everything still stems from the anthropocentric exploitation of the natural environment. As a result, by using this theory the study challenged how individuals, communities and companies can contribute to the lowering of carbon emissions and the sustainability of the environment.

The second theory that guided the study is sustainable development. Due to the high rate of GHG emissions, sustainable development was introduced by the Brundtland

Commission in 1987. Sustainably development became publicly known in the 1980s when the “International Union for the Conservation of Nature (IUCN) and Natural Resources set forth the World Conservation Strategy with the purpose of attaining development that is sustainable through safeguarding the world’s living resources” (IUCN 1980). Sustainable development theory became widely accepted after the Brundtland Commission’s report in 1987. It was defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987: 43). Sustainable development theory as put forward by the Brundtland Commission offers an understanding of what sustainable development is taking into consideration its long-term impact and the need to ensure that future generations are provided for.

Sustainable development looks at three pillars, namely, the economy, the society and the environment. The theory also offers “an economic strategy for addressing concerns about ecological integrity and social justice because it expresses the ethical capacity to address these concerns” (Davidson 2000). The theory takes equal note of the three pillars meaning that no pillar is above the other. The theory encourages a sustainable environment, good and healthy lives for communities and a stable economy.

1.10. Aims of the study

The general aim of the study was to ethically investigate the carbon tax policy as a new strategy that South Africa has implemented to lower GHG emissions. In doing so, the study examined environmental issues such as environmental pollution and climate change. It also examined the consequences of environmental pollution which contributes to climate change. The study further aimed at analysing the carbon tax policy through the lens of sustainable development and environmental stewardship to determine how these two theories can help in strengthening the policy. Finally, the study aimed to provide the positives and negatives of the carbon tax policy in South Africa as it is a newly implemented policy which may come with numerous implications for the country’s people.

1.11. Structure of the Dissertation

Chapter One is the introductory chapter and it provided a general summary of the study. The chapter began with the background and motivation for the study, that is, an ethical evaluation of the South African carbon tax policy and the possibility of curbing the issues of Climate Change and environmental pollution. The research problem was outlined, and this was followed by the key research question and research sub-questions, and the key objective and research sub-objectives. The theoretical framework was outlined and, finally, the research method and methodology used in the study were discussed. The chapter ended with a conclusion.

Chapter Two acknowledges and presents existing knowledge on the ethical environmental issues of pollution and climate change. The aim is to give a deeper understanding of environmental pollution and climate change by providing the views of scholars that have written on the issues. In other words, this chapter serves as an exposition of the subject matter of the study which will help us to properly understand it. The chapter ends with a conclusion.

Chapter Three focuses on a mechanism to assist in minimising environmental pollution and climate change, namely, a carbon tax. The chapter examines what a carbon tax is and then discusses the carbon tax policy in South Africa. As part of the discussion is the polluter must pay principle. The chapter ends with a conclusion.

Chapter Four comprises the theoretical framework. In this chapter, I discuss the theories that guided the study. Carbon tax as a strategy implemented in South Africa to lower GHG emissions is viewed through the lens of the ethical theories of sustainable development and environmental stewardship. The chapter is divided into three sections: The first section looks at the ethical theory of sustainable development and the South African understanding of the concept. The second section explores the ethical theory of environmental stewardship. The third section briefly discusses the connection between sustainable development and environmental stewardship. The chapter ends with a conclusion.

Chapter Five is the analysis. The chapter will ethically analyse and interrogate the payment of carbon tax as a means to reduce GHG emissions in South Africa. The chapter comprises

two sections and analyses the findings of the research through the lens of sustainable development and environmental stewardship. As with previous chapters, the chapter ends with a conclusion.

Chapter Six is the final chapter. The chapter begins with a summary of each chapter of the dissertation and then provides the recommendations that emerged from the study. The recommendations aim to underscore the importance of carbon tax as a means to reduce GHG emissions in South Africa. The focus for future research is then provided, a call to action is outlined, and the chapter (and study) ends with a conclusion.

1.12. Conclusion

This chapter introduced the study in doing so it provided some of the ideas and the issues that will be discussed fully in the dissertation. Importantly, the background to the study, the research problem, key questions and objectives, theoretical framework, and method and methodology were introduced and where appropriate discussed. The chapter ended with an outline, by chapter, of the dissertation.

Chapter Two, which follows, examines the two ethical environmental issues which are the focus of the study, namely, environmental pollution and sustainable development. In doing so it draws on the literature (including books and journal articles) that have been written on these issues. The content of the chapter will be presented thematically and to begin with, environmental ethics will be discussed.

Chapter Two

An Ethical Overview of Environmental Issues

2.0. Introduction

The previous chapter provided the introduction to the study. It included the background of the study, the main question, sub-questions, objective, sub-objectives, the research problem statement, the theoretical framework, the method and methodology and the outline of the dissertation. This chapter acknowledges and presents some of the existing knowledge on two ethical environmental issues, namely, environmental pollution and climate change. The chapter aims to give a deeper understanding of environmental pollution and climate change by providing the views of scholars that have written on these issues. This will help us properly understand the study. In other words, this chapter serves as an exposition of the subject matter.

Thus, based on the above, this chapter evaluates what other scholars have said about environmental pollution and climate change. This chapter is arranged thematically. Firstly, it will define and discuss environmental ethics and the African view of environmental ethics. Secondly, Segun Ogungbemi's understanding of the environmental crisis will be discussed. The reason for this is because his work contains an African perspective of the environment and it has philosophical insights. Thirdly, the chapter will discuss environmental pollution, the different types of pollutants (in this case highlighting the different categories of environmental pollution), and the effects of environmental pollution on humans and non-humans. The latter will include a discussion of climate change. The chapter ends with a conclusion.

2.1. Environmental Ethics: A Brief Definition

According to Kristin Shrader-Frechette, "environmental ethics, as a field of philosophical study, began in the 1970s and 1980s, in part as a result of the environmental movement and largely in Anglo-American work" (2009). Environmental ethics is concerned with the problem of accountable individual behaviour regarding the sustainability of natural resources

(Hargrove 1992: 175-177). This means that environmental ethics is concerned with human beings' ethical correlation with the environment. Alasdair Cochrane emphasises that the main aim of environmental ethics is to give an insight into our moral obligations when it comes to such concerns (2006: 2). The development of environmental ethics awareness was supported by the publication of two books in the 1960s. The first is Rachel Carson's book *Silent Spring* (1962). Carson made readers aware of the negative impacts that chemical pesticides have on the natural environment in that they trigger some risks to the health of the public and wildlife gets destroyed. In a similar vein, Paul Ehrlich's book, The *Population Bomb* (1968) warned readers of the alarming rate at which the population was growing. It also gave insight on the negative effects that population growth has on the environment through loss of biodiversity, land degradation and climate change.

2.1.1. African View on Environmental Ethics

According to Michael Onyebuchi Eze, "the African view on the environment is different from other intellectual traditions in that it seeks a balance between the individual and the environment. Respect for the environment is not a slavish or impractical submission; it is a view grounded in metaphysical realism and ontological holism" (2017: 629). What this means is that in Africa there is a balanced and interdependent relationship between the individual and the environment. This balance and interdependent relationship bring about the idea of holism. In terms of holism, the individual and the environment are one and because of this the individual respects the environment. This view is not only about human-to-human relationships, respect and oneness, but also involves the inclusion of everything around us, like the fauna[2] and flora[3]. This supports the idea that Africans are more communitarian in their view and approach to things as opposed to being more individualistic.

Godfrey Tangwa in his article entitled *Eco-bio-communitarianism*, shared the same view when he asserted that it comprises the "recognition and acceptance of interdependence and peaceful coexistence between earth, plants, animals, and humans" (2004: 387-389). This means that the relationship between human beings and the environment is a deep one as they

[2] Fauna means "all the animals that live wild in a particular area" (Cambridge Dictionary)
[3] Flora means "all the plants of a particular place or from a particular time in history" (Cambridge Dictionary)

are both dependent on one another for survival. Therefore, this relationship is more communitarian in nature. Eze contends that:

> Most critically, the African view changes the basic question we need to ask about environmental ethics. The focus here is not on duty, that is, what must I do as an ethical agent? The emphasis herein is on the human individual, that is, who am I? The question of what duty is right or wrong is substantively different from how do I become a good or responsible virtuous agent? (2017: 629).

The African view of the environment has raised many ethical questions. These questions do not only focus on the moral duty that one has but also focus on individual responsibilities. As much as Africans are communitarian, the individual's obligations also matter. Thus, individuals do their duties for the betterment of the community. In terms of community, Mogobe Ramose elucidated that the idea of the community includes "the greater environing wholeness in the sense of both the encompassing physical and metaphysical universe, together with the human universe in the sense of the community" (1999). We all have duties towards the protection and sustainability of the environment. Individually we need to take cognisance of what we must do as ethical agents. This should be done with the idea of knowing what is morally right or wrong, and with the emphasis on the importance of the individual. Thus, as ethical agents, we need to be aware of what is right and wrong concerning the protection of the environment and the idea of environmental stewardship and sustainable development.

In environmental ethics, there have always been environmental crises such as environmental pollution and degradation, environmental injustice, and the poverty of effective coping and management strategies in challenging these crises. According to Philomena Aku Ojomo, "the causes of environmental pollution and degradation, environmental injustice, poverty of effective coping and management strategies in challenging the environmental crisis, and lack of a viable environmental ethics that takes cognizance of the peculiar dynamics of the environmental crisis in Africa are issues worth courting philosophically" (2011: 572). Aku Ojomo is of the view that there is an environmental crisis in Africa, and this should be viewed and tackled philosophically.

To give an understanding of the environmental ethical issues from an African perspective Segun Ogungbemi's views are discussed below.

2.2. Segun Ogungbemi's understanding of the Environmental Crisis

When seeking to get an in-depth understanding of the environmental crisis in Africa, the work of Segun Ogungbemi (1997) cannot be disregarded as it provides the African perspective on the environment as well as philosophical insights. In his article titled "An African Perspective on the Environmental Crisis", he reflects on the source of the environmental crisis in Africa.

Ogungbemi understands the issue of the environmental crisis in Africa from three points of view: (1) ignorance and poverty, (2) science and technology and (3) political conflict (international pressures). He avows that for one to understand the environmental crisis in Africa one has to understand the traditional and the modern societal structures that have led to environmental degradation. With regard to the first point on ignorance and poverty, he argues that a majority of traditional Africans lived in rural areas. People in the rural areas experienced poverty in that they lacked basic services such as clean water, electricity and adequate sanitation. Consequently, that has led to rivers being polluted by human waste which in turn has led to water-borne diseases like cholera and typhoid.

In rural areas, air pollution is caused by the burning of the wood for cooking and heating purposes. This is a predominant act in traditional Africa leading to the release of toxins and subsequent poor air quality. Ogungbemi argues that poverty and ignorance do "not necessarily exonerate our people from their contribution to environmental hazards" (1997: 204). This was his way of making readers understand where the behavior came from and that this was due to the lack of service delivery. This is where science and technology play a role. Ojoma underscores that "besides the crude contribution of traditional African societies to the world environmental crisis, mention must be made of the more catastrophic contribution of modern Africa to the environmental crisis" (2011: 574). Ogungbemi argues that due to Africa's economy, it cannot take full advantage of its natural resources.

Ogungbemi further highlights that the rate at which natural resources like water, air and land are used is contrary to the traditional environmental conservation (1997: 205). In line with this, development through science and technology in Africa has led to the loss of natural resources like trees, which in turn leads to turbidity, desertification, erosion and floods. Air quality is also affected by techno-scientific actions. The most fundamental of these is the unrestrained rate of emissions that come from cars and industrial machines. This has led to an increasing rate of water, air and land pollution both in South Africa in particular and in Africa at large.

Ogungbemi also acknowledges the unprecedented population growth in modern Africa as an additional factor that has constantly continued to intensify the damage to the environment on the continent. He emphasises that traditional African people loved and respected nature and that environmental ethics for them came naturally in that they never took more than what they needed from the natural environment. This possibly clarifies why the planet, trees, rivers, wind and other natural resources are traditionally said to be mutually natural and divine.

Some Africans regard some of their resources as sacred. According to Gonzalo Oviedo, Sally Jeanrenaud and Mercedes Otegui, sacred natural sites can be defined as the "natural areas of special spiritual significance to peoples and communities. They include natural areas recognized as sacred by indigenous and traditional peoples, as well as natural areas recognized by institutionalized religions or faiths as places for worship and remembrance" (2005: 3). In Africa, these sites in most cases are highly protected and no damage is done to these areas; this also benefits the environment as it is sustained and taken care of. For example, majority of the cases the soil that is considered sacred from inside out and it should be left alone.

Ogungbemi goes on to ask questions like: "How do we know how much we need, given the nature of human greed and insatiability? Who judges whether we have been taking more or less than we need from the natural resources? If we have been taking more than we need, what are the penalties and how fair are they?" (1997: 208). These questions are important and it is from these questions that Ogungbemi formulated environmental traditional practice

which looked at “ethics of care” to make it pertinent to the modern African situation. He developed the “ethics of nature relatedness” and through this, he offers some practical solutions to the environmental crisis. Firstly, he recommended the production, transmission and supply of solar energy at a sensible price as a means of decreasing Africans’ excessive use of wood, coal and petrol as forms of energy. Secondly, with regard to the problem of the high population growth, Ogungbemi stated that “when our population has reached an alarming situation, nature will invariably apply its break (through volcanic eruptions, earthquakes, etc.) and have a drastic reduction in our population growth rate”. Thirdly, he suggested a change in direction for Africa politically in that good policies which are eco-friendly need to be established. He further advised that politicians should have the willpower needed to decrease the amount of industrial and agricultural waste and to correctly store such waste so that our industrial and commercial centres, as well as our rural areas, are safe from air, land and water pollution (Ogungbemi 1997: 209).

2.3. Defining Environmental Pollution

According to Ramamohana, Reddy and Appannagari, environmental pollution can be defined as “unwanted discharge of material or energy into water, land, or air that causes or may cause acute (short-term) or chronic (long-term) detriment to the Earth’s ecological balance or that lowers the quality of life” (2017: 152; see also Coker 2011). Environmental pollution can be seen as the release of materials that are feasibly detrimental to human beings and other living organisms within the environment. In light of the above, contaminated matters that are capable of instigating damage to both living and non-living organisms within the ecosystem can be considered as environmental pollution.

As much as environmental pollution is harmful to the environment, James Gustave Speth argues that “by definition, pollution is too much of something harmful in the wrong place. In appropriate quantities, some erstwhile pollutants are beneficial” (1988: 263). In view of this, it will be correct to say that environmental pollution is harmful to the environment and beneficial to us as well. Speth states that:

> In appropriate quantities, some erstwhile pollutants are beneficial. Phosphates and other plant nutrients are essential to aquatic life; too much

> of these nutrients, however, and eutrophication results. Carbon dioxide in the atmosphere helps keep Earth warm enough to be habitable, but the build-up of vast quantities of excess carbon dioxide from fossil fuel use and other sources now threatens to alter the planet's climate (1988: 263).

Carbon dioxide (CO2) in the atmosphere is helpful in that it helps to keep the earth warm. Some pollutants that are excreted in small quantities are beneficial to the environment. Environmental pollution is beneficial in some ways but due to the high volume of pollution, the damage is too great. The development of our societies through the introduction of gas-powered cars and the increase in the human population have instigated an exponential growth in the manufacturing of goods and the provision of services. This is where environmental ethics become an important factor because we must do what is right in terms of sustaining the environment.

According to Segun Ogungbemi, the ethics of care (noted above) is essential to the traditional understanding of environmental protection and conservation (1997: 204). This suggests our ethical responsibility towards environmental protection. Our responsibility in terms of protection and care of the environment entails that we make better judgments to protect the environment. Our actions should be focused on the "definite concerns of ethical judgment, centering mainly on ethical questions about the right or wrong sequence of action regarding the environment or ecosystems" (Eze 2017: 621).

Jeffrey Pierce, Ruth Weiner and Aarne Vesilind elucidate that environmental pollution can be defined "as the contamination of air, water, or food in such a manner as to cause real or potential harm to human health or well-being, or to damage or harm nonhuman nature without justification" (1998: 1). This is not to say that if potential harm to human health or damage or harm to nonhuman nature can be justified then it should be acceptable. What it means is that, at least, there should be justifiable reasons for the harm or damage done, and that the decision to carry on with something that his harmful to the environment should be evaluated, because environmental harm is dangerous and should not be accepted. Whatever the justification may be, environmental pollution is dangerous and should be addressed.

Pierce, Weiner and Vesilind further evaluated environmental pollution simply and knowledgeably. They elucidate that:

> Today there is no question that the human species has the capability of destroying its home and that we have taken major steps toward doing exactly that. And yet, while much has changed in a generation, much has not. We still have air pollution; we still contaminate our water supplies; we still dispose of hazardous materials improperly; we still destroy natural habitats as if no other species mattered. And, worst of all, we still populate the earth at an alarming rate (Pierce, Weiner and Vesilind 1998: xiii).

It is we humans who are destroying the environment through anthropocentrism. Samuel Akpan Bassey and Thomas Micah Pimaro Jr state that, "anthropocentrism sees man at the center of the universe" (2019: 129). Anthropocentrism is the belief that humans are superior compared to the natural environment. In line with the above, Tangwa highlights that "an anthropocentric ethic, even an individualistic one, if it were sufficiently rational, need not necessarily endanger the environment, just as an eco-bio-communal one may not necessarily forestall all dangers to the environment" (2004: 392-393). Through this anthropocentric approach, humans have negatively destroyed the planet. Gary Steiner highlights that this approach is problematic, and it has led to animals being used for food, clothing and experiments.[4] It is important to underscore that exploitation does not happen to animals alone, it also happens to the natural environment.

Through anthropocentrism, we now have issues such as environmental pollution which has consequently led to the issue of climate change. The concern for environmental pollution is an ongoing dilemma which has been caused by anthropogenic actions. We, as human beings, are destroying the planet because of the bad decisions we make and there is thus a need for us to take responsibility for our actions in some way. Vesilind, Pierce and Weiner furthermore explicate that:

> Although the battle to preserve the environment is still raging, some of the rules have changed. Now we must take into account risk to humans and be able to manipulate concepts of risk management. With an increasing population and fewer alternatives to waste disposal, this problem has intensified. Environmental laws have changed and will no doubt continue to evolve. The economic cost of preservation and environmental restoration continues to increase. Attitudes toward the environment are often couched

[4]See the interview on https://www.youtube.com/watch?v=JK3kbl75-xc [Accessed 15 August 2020].

> in what has become known as the environmental ethic. Finally, the environmental movement has become politically powerful, and environmentalism sometimes can be made to serve a political agenda (1998: xiii).

The sustainability of the environment has become important in that there are laws which guide the preservation of the environment. These laws change repeatedly in order to pass on the importance of environmental sustainability. In South Africa, there are various approaches, rules and regulations in place to address how to manage risks to the environment. For example, South Africa has the National Environment Management Act (NEMA) that is an umbrella act for other acts and laws guiding the behaviour of humans towards environmental protection and sustainability.

Environmental pollution is categorised into natural pollution and man-made pollution. Natural pollution is caused by natural phenomena while man-made pollution is caused by human activities (Appannagari 2017: 152). Natural pollution includes volcanic dust, emission of natural gas, the release of CO2 by animals and plants and UV-rays (Robinson and Robbins 1970: 233-235). Man-made pollution includes the burning of fossil fuels, waste disposal, industrial production and fertilizers made of chemicals (Gabrielides *et al*. 1991: 437-441). Thus, contaminated substances that can cause harm to human beings and other living organisms within the environment can be considered as pollutants and can cause environmental pollution.

2.3.1. The Different Types of Pollutants

According to Abhijit Mitra, "a pollutant is a substance (e.g., dust, smoke), chemical (e.g., SO2 or Methyl mercury) or factor (like heat, noise etc.) that on release into the environment has an actual or potentially adverse effect on human interests" (2018: 59). A high concentration of pollutants in the environment causes environmental pollution and land degradation at some point. There are two types of pollutants namely biodegradable and non-biodegradable pollutants. Biodegradable pollutants involve domestic sewage that is simply decomposed by microbial actions into smaller remains, which can be reused (Pulgarin and Kiwi 1996: 55-56). Non-biodegradable pollutants are not decomposed by natural practices and domestic sewage is an example of natural practices. Examples of non-biodegradable

materials are heavy metals, aluminium and long-chain phenolic chemicals (Mitra 2018: 59; Seo *et al*., 2007: 251-259). There are many pollutants which are introduced into the environment in different ways and they have numerous and distinct effects on health.

2.3.2. Classifications of Pollutants

Pollutants can be classified into four categories, namely, quantitative pollutants, qualitative pollutants, primary pollutants, and secondary pollutants. These categories are discussed below.

2.3.2.1. Quantitative Pollutants

Quantitative pollutants include **"**the substances which are already present in the environment but are termed as pollutants when their concentration (quantity) increases in the environment" (Josh 2020). For example, CO2 exists in the environment naturally but it is now in a quantity that is larger than its natural state and, because of this, it is now considered a quantitative pollutant. As such, it causes damage to the environment and also affects the fauna and flora.

2.3.2.2. Qualitative Pollutants

Qualitative pollutants are "substances which are not normally present in the environment and are added by human beings and are pollutants by nature" (Josh 2020). These types of pollutants are not natural and are due to anthropogenic activities. Examples are pesticides and insecticides, which can cause water, soil and other kinds of pollution. They find their way into rivers and dams causing, among other problems, algal bloom.

2.3.2.3. Primary Pollutants

A primary pollutant can be defined as "an air pollutant emitted from a source directly into the atmosphere"[5]. The source can be either an anthropogenic method which includes industrialisation and emissions, or a natural method like volcanic eruptions and sandstorms.

[5] For more information go to: http://www.differencebetween.net/

These types of pollutants include particulate matter (PM), carbon monoxide (CO), sulphur dioxide (SO2) and nitrogen oxide (NOX).

2.3.2.4. Secondary Pollutants

A secondary pollutant is "an air pollutant formed in the atmosphere as a result of the chemical or the physical interactions between the primary pollutants themselves or between the primary pollutants and other atmospheric components" (Josh 2020). This means that these are substances that are produced by chemical reactions amongst the primary toxins and the elements of the environment. These substances include nitrogen oxide (NOX), smog ozone and smog.

2.3.3. Categories of Environmental Pollution

As noted above, environmental pollution is categorised into two, namely, natural pollution and man-made pollution. Natural pollution is caused by natural phenomenon, while man-made pollution is caused by human activities (Appannagari 2017: 152; see also Strydom *et al*. 2009). Environmental pollution has both short-term and long-term effects on the environment and both can be addressed for the betterment of the environment and human lives. Within both types, we have things like air pollution, water pollution, thermal pollution and noise pollution. It is important to emphasise that both categories of environmental pollution are considered as something (for example, a material or natural hazard) that can affect the environment when discharged into the water, land or air.

2.3.3.1. Air Pollution

Air pollution can be described as a phenomenon in which substances put into the air by the action of humans is enough to generate harmful effect to their wellbeing, vegetables and land or hinder their enjoyment of their land (WHO 2006; see also Kampa and Castanas 2008: 362-367; Stern 1977). It is the pollutants which are released into the atmosphere that cause air pollution. The sources of air pollution include industrial pollutants, transport (such as cars and motorcycles), burning of fuels, aircraft emissions, agricultural activities, ionising radiation, cosmic rays and suspended particulate matter (SPM) (Ogungbemi 1997: 330-337; see also Holman 1999: 115-148). These, therefore, lead to the depletion of the ozone layer

and, in turn, climate change due to the GHGs that are present in the atmosphere, especially CO2 which is the main contributing factor to air pollution.

As humans, we cannot live without air. Breathing is a necessity regardless of the quality of the air we breathe in. Arthur Dahl states that:

> Different types of air pollutants reflect distinct ethical challenges. Air pollution from industrial sources is a significant problem in most countries. Since these are usually identifiable point sources, they are relatively easy to regulate. Several approaches are available to industry: pollution prevention through changes in operating practices, improved and preventive maintenance, or changes in raw materials; building good air pollution control systems into new or modified production processes; improving or replacing air pollution control systems in existing facilities; and reducing air pollution and improving energy efficiency through process change (which often lowers costs as well) (2011).

The global ethical issue is that air pollution causes climate change and respiratory issues for humans. It is our moral responsibility to correct our actions concerning sustaining the environment. It is up to each individual and company to take responsibility for doing so or and not to turn a blind eye to it. Air pollution can be reduced if ethical reinforcement and behaviour are monitored. The reduction of emissions can be done through behaviour change by the polluters which, in turn, will assist with sustainable development. Most countries have developed solutions to how they will mitigate the issue of air pollution. For example, South Africa has implemented a carbon tax which I will elaborate on in Chapter Three.

2.3.3.1.1. Sources of Air Pollution

Vehicle emissions are a source of air pollution, particularly in metropolitan areas. In South Africa, this is due to the increasing number of individuals owning vehicles. According to the *South Africa Environment Outlook*, "the increase in the number of vehicles has, as expected, resulted in an increase in fuel consumption"[6]. Dietrich Schwela elucidates that "in urban areas, vehicle emissions may be responsible for 90 to 95 per cent of carbon monoxide and

[6]For more information see:
https://www.environment.gov.za/sites/default/files/reports/environmentoutlook_chapter10.pdf

60 to 70 per cent of nitrogen oxides within the atmosphere" (2004). The emissions from vehicles cause a lot of smog and also contribute to the carbon emissions footprint.

The level of air pollution from fuel burning in households is a growing concern as are the associated problematic health effects. The *Environment Outlook* further highlights that:

> Low-income households and informal settlements are dependent on domestic fuels, such as coal, paraffin and wood, for cooking and heating. Domestic fuel burning results in pollutants such as sulphur dioxide, carbon monoxide, VOCs and particulates. The release of sulphur dioxide, or hydrogen sulphide and carbon dioxide is dependent on combustion and fuel characteristics.

In certain areas in South Africa, some low-income households still use wood cooking and other fuels to make fire. Doing so causes complications with regard to the issue of environmental pollution. For example, some of the stoves used are not vented. Thus, the high level of emissions due to the use of the stoves that are not ventilated consequently leads to poor air quality in the area.

Veld fires also contribute to the issue of air pollution. Not only do they affect the air quality but also the well-being of community members. The National Veldfire Risk Assessment (NVRA) highlights that "there is a marked trend in fire incidence from the eastern to western parts of the country and, to a lesser extent from northern to southern parts" (Forsyth *et al*. 2010). In South Africa, veld fires pose a threat because they damage the natural biodiversity and also affect animal habitats. Irrespective of the effect on air quality, veld fires trigger economic, social and environmental damage with "industrial losses of infrastructure and the related financial implications, destruction of power lines and other infrastructure such as farm and country resorts" (Forsyth *et al*. 2010). The social impact of veld fires comprises the loss of resources like stock and grazing for rural livelihoods. The fires also lead to loss of biodiversity, ecosystem decline and the extinction of fauna and flora.

2.3.3.2. Water Pollution

Water pollution can be defined as the introduction of toxic chemicals in water bodies at a level that is extreme and, in turn, the biota is affected to a considerable extent (Olaniran 1995:

151). The sources of water pollution include domestic, industrial, agricultural, shipping, radioactive and aquaculture wastes and heat. Water pollution affects not only humans but also the flora and fauna. "Human contribution to water pollution is enormous by way of defecating, dumping of refuse, industrial wastes and washing of clothes etc." (Eguabor 1998: 49). Human actions are thus the main contributing factor towards the issue of water pollution, but the concern is that we need water because we cannot live without it.

Water pollutants can either be organic or non-organic. The organic water pollutants encompass insecticides and herbicides including other chemicals like bacteria from the sewage and food of the livestock, pathogens and volatile organic compounds. On the other hand, non-organic water pollutants include burning practices, silt from surface run-off, landfilling, industrial influences, and agricultural practices which release nitrates and phosphates (Singh and Gupta 2016: 3).

2.3.3.2.1. Sources of Water Pollution

According to the Acciona, "humans are the main cause of water pollution, which is triggered in many ways: by the dumping of industrial waste; due to temperature rise, that cause the alteration of water by reducing the oxygen in its composition; or due to deforestation, which causes sediments and bacteria to appear under the soil and therefore contaminate groundwater"[7]. Water pollution is caused by anthropogenic activities. These actions or activities of humans, such as industrial dumping, have negative effects on the water. Dumping leads to oxygen depletion in the water thus negatively impacting on marine life. Water is a very important natural resource which is non-renewable, and in this world, nothing would survive if there was no water. Polluted water is not good for animals or for humans which is why sustainable development and environmental stewardship are vital.

2.3.3.3. Noise and Thermal Pollution

Noise pollution is an undesirable and unpleasant noise that gets discharged in the atmosphere consequently causing an unfavourable effect on the environment (WHO 1990). Noise

[7] For more information see: https://www.activesustainability.com/water/causes-consequences-water-pollution/

pollution can be caused by aeroplanes, sound systems, cars, crackers and industry. Thermal pollution "is defined as a sudden increase or decrease in temperature of a natural body of water which may be ocean, lake, river or pond by human influence" (Mitra 2018: 72; see also Nordell 2003: 305-312). This happens when the natural temperature changes dramatically which consequently negatively affects biotic life and the fauna and the flora. The sources of thermal pollution are soil erosion, deforestation, natural causes (like volcanoes and geothermal activities), and water used as a cooling agent in power, manufacturing and industrial plants.

2.3.4. The Effect of Environmental Pollution on Humans and Non-humans

The discharged toxins in the environment affect the flora, fauna and humans in numerous ways. The main effect of environmental pollution is climate change. Climate change and environmental pollution are issues of concern all over the world. For example, in South Africa, climate change and environmental pollution are affecting ecosystems. Furthermore, climate change and environmental pollution cause poverty, land degradation, waste and littering, health hazards and urbanisation (Darkoh 2009: 96). There is a need for an effective strategy which will be able to curb carbon emissions thereby saving the environment not only for benefit of the present generation but for future ones as well.

Climate change means a change in the state of the climate that can be recognised (DEA 2018: 9; see also Klein 2015; Change 1990: 289). This can be done, for example, by using statistical tests or by changes in the mean or the variability of its properties that persist for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or land use.

Greta Thunberg, a climate change activist, states that "people are suffering. People are dying and dying ecosystems are collapsing. We are at the beginning of a mass extinction, and all you can talk about is the money and fairy tales of eternal economic growth"[8]. Climate change

[8] See the Summit for more information: https://www.youtube.com/watch?v=KAJsdgTPJpU.

is an ongoing dilemma, which is affecting the weather leading to the warming of the earth. South Africa is also experiencing serious negative impacts of climate change, which in turn affect the natural environment and development of the country. “Climate change is already a measurable reality and along with other developing countries, South Africa is especially vulnerable to its impacts” (Department of Environmental Affairs 2011: 20). Not only does climate change affect the environment but also economic and social development.

Every individual and government must take care of the environment and find the means to sustain it. According to Katie McShane (2016), under conditions of rapid and serious climate change, we will soon be living in very unfamiliar circumstances in which emotional attachments and relationships with others will be less relevant. We have to make a change with regards to sustaining the environment for our own good and also for future generations.

David Le Page, Glen Tyler-Davies and Gillian Hamilton make the point that “how SA chooses to respond to climate change and its impact on the country will affect economic growth and social development for decades to come, yet climate change remains side-lined by the government and key sectors that are most vulnerable to its effects” (2019). Climate change in South Africa is a vast impediment and requires more attention and practical adaptation strategies for fauna and flora survival. South Africa has implemented some laws such as the carbon tax to help curb environmental pollution and climate change. According to Donald Brown:

> An ethical approach to climate change would limit GHG emissions by law at levels necessary to prevent human-induced climate change harms to people and ecological systems. For instance, many governments have established legal requirements on the percentage of renewable energy required of electricity providers, a policy response that does not rely on pricing carbon. An ethical approach to climate change is based on different justifications for reducing change harms than some economic approaches (2010: 1).

Thus, an ethical approach to mitigating climate change entails that the persons responsible for human-induced climate change harms (such as carbon emissions) take responsibility for the damage they cause to the environment and, by so doing, not harm others. Even laws and environmental policies have to highlight the importance of the environment and that both

human beings and the environment need each other. The approach creates change in the way things are done to protect and preserve the environment. All national governments have a duty to make arrangements that reduce GHG emissions from their region and ensure their country's fair share of safe global GHG emissions as per the United Nations Framework Convention on Climate Change (UNFCC) and the Paris Agreement.

In view of the above, the important questions to ask are: What is the UNFCC? What is the Paris Agreement? The UNFCC "entered into force on 21 March 1994. Today, it has near-universal membership. The 197 countries that have ratified the Convention are called Parties to the Convention. Preventing 'dangerous' human interference with the climate system is the ultimate aim of the UNFCCC" (UNFCC 2020). The key objective of the UNFCC is to reduce anthropogenic interference and it is also about promoting sustainability rather than sustainable development. In a similar vein "At COP [Conference of the Parties] 21 in Paris, on 12 December 2015, Parties to the UNFCCC reached a landmark agreement to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future" (2020). This means that the countries that are part of the UNFCCC had an agreement to decrease the rate of climate change. The reason why it is called the Paris Agreement it is because this agreement was made in Paris.

The main aim of the Paris Agreement is to "reinforce the universal response to the danger of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius" (UNFCCC 2020). In addition, the agreement aims to increase the capability of countries "to deal with the impacts of climate change, and at making finance flows consistent with low GHG emissions and climate-resilient pathway" (UNFCCC 2020). This agreement offers support for developing countries to also be part of keeping the planet clean. The Paris Agreement requires that all the countries involved in the convention to make their greatest efforts through nationally determined contributions (NDCs). With the NDCs, countries can set different goals which will work best for them and they have to present these to the UNFCCC. All countries included in the Paris Agreement have to provide frequent reports on their level of emissions as well as their implementation efforts.

As a participant, South Africa is obliged to compose a set of NDCs that outline the country's role in achieving the universal goals of lowering or cutting national GHG emissions and adapting to the impacts of climate change (United Nations 2015). South Africa's goals, as outlined in its NDC document, are:

> • **Goal 1:** Develop a National Adaptation Plan, and begin operationalization as part of implementing the NCCRP for the period from 2020 to 2025 and for the period 2025 to 2030;
>
> • **Goal 2:** Take into account climate considerations in national development, sub-national and sector policy frameworks for the period 2020 to 2030;
>
> • **Goal 3:** Build the necessary institutional capacity for climate change response planning and implementation for the period 2020 to 2030;
>
> • **Goal 4:** Develop an early warning, vulnerability and adaptation monitoring system for key climate-vulnerable sectors and geographic areas for the period 2020 to 2030, and reporting in terms of the National Adaptation Plan with rolling five-year implementation periods;
>
> • **Goal 5:** Development of a vulnerability assessment and adaptation needs framework by 2020 to support a continuous presentation of adaptation needs; and
>
> • **Goal 6:** Communication of past investments in adaptation for education and awareness as well as for international recognition (DEA 2015: 3-6).

The above goals are set by the NDCs of South Africa and which the country has to follow to reduce the level of its carbon emissions. The Agenda for 2030 for Sustainable Development was implemented alongside the fixed 17 Sustainable Development Goals (SDGs) the same year that the Paris Agreement was agreed upon. The SDGs support the Paris Agreement by specifically highlighting climate change in SDG 13. It commits to "take urgent action to combat climate change and its impacts" and features across many of the other SDGs, because of its cross-cutting nature (UN 2015, Goal 13).

In addition, SDG 13 explicitly indicates aims connected to the strengthening of flexibility and adaptive ability which bring it into direct line with the adaptation goals of the Paris Agreement (UN 2015, Goal 13). In a similar vein, the Sendai Framework for Disaster Risk Reduction 2015-2030, which was implemented on 18 March 2015, states that climate change stands as one of the "underlying disaster risk drivers", and that climate change has the ability

to intensify the seriousness of a disaster (UNISDR 2015: 10). Planning, formulating and organising methods to curb the issue of climate change, which is correlated to building resilience and disaster, are some of the main priorities for the Sendai Framework. South Africa must abide by the goals it has created as part of its way of following the Paris Agreement which is about reducing the high rate of GHG emissions in the country.

2.3.5. The Effect of Environmental Pollution on Human Health

According to National Geographic, like people, animals, plants and entire ecosystems can suffer effects from air pollution (2011). The side effects of air pollution can be long-term (lasting for a lifetime) or short-term. The short-term air pollution effects include irritation of the eyes, nose and throat as well as upper respiratory infections, headaches, nausea and allergic reactions. Long-term exposure can lead to long-lasting respiratory disease, heart disease and lung cancer. Katye Altieri and Samantha Keen state that:

> Developing countries like South Africa have a heavy reliance on fossil fuels, resulting in productivity losses and mortality due to high concentrations of air pollution, namely, fine particulate matter (PM). A recent IGC study indicates that 7.4% of all deaths in South Africa in 2012 were due to chronic exposure to fine PM, costing the country up to 6% of its GDP. High rates of TB and HIV/AIDS infection mean there is a critical need for South Africa-specific studies on the association between air pollution and mortality (2019).

The impacts of air pollution threaten human health and can even lead to death. South Africa is highly dependent on the burning of fossil fuels to generate electricity. This dependency results in huge amounts of carbon being emitted into the atmosphere which in turn results in the air quality being affected. Human health is also affected and this can lead to chronic diseases and, at times, to death. The World Health Organization (WHO) also points out that "the health effects range from increased hospital admissions and emergency room visits to increased risk of premature death" (2020). Air pollution thus "costs" in terms of lives lost as well as humans' well-being. When looking at the effects of air pollution worldwide, the WHO has detailed that "an estimated 4.2 million premature deaths globally are linked to ambient air pollution, mainly from heart disease, stroke, chronic obstructive pulmonary

disease, lung cancer, and acute respiratory infections in children" (2020). A carbon tax may be the solution to the negative impact that emissions have on the health of human beings.

2.3.5.1. Respiratory Disorders

A respiratory disorder is one way in which air pollution can affect humans. Most pollutants enter the human body via the airways and the "respiratory system is in the first line of battle in the onset and progression of disease resulted from air pollutants" (Ghorani-Azam, Riahi-Zanjani and Balali-Mood 2016: 5). Much depends on the amount of inhaled pollutants and their accumulation in the target cells in terms of the level of harm done to the respiratory system. Air pollution is considered to be the major cause of asthma and cancer. Asthma is a respiratory illness that is likely to develop as a result of being exposed to air pollutants (Stoner, Anderson and Buckley 2013: 176). Both adults and children are vulnerable if exposed to high amounts of air pollutants in an area.

2.3.5.2. Cardiovascular Dysfunctions

Based on the numerous epidemiologic and experimental studies, it has been proven that the exposure to air pollutants can cause cardiac-related illnesses (Nogueira 2009: 715-733; also see Andersen *et al*. 2012: 320-325; Snow *et al*. 2014: 83-93). Air pollution changes the white blood cells count.

2.3.5.3. Neuropsychiatric Difficulties

Toxic pollutants affect the nervous system which comprises neurological difficulties and psychiatric disorders (Ghorani-Azam, Riahi-Zanjani and Balali-Mood 2016: 5). The toxins released into the air damage the nervous system causing some neurological difficulties that may have devastating consequences. Psychiatric disorders, on the other hand, may manifest in aggression and/or antisocial behaviours. New research has shown that the combination of air pollution and neurobehavioral hyperactivity causes age-inappropriate behaviours and criminal activity (Newman *et al*. 2013: 731-736; Haynes *et al*. 2011: 1243-1248).

2.3.5.4. Long-term Complications

Takashi Nakano and Taiichiro Otsuki define long-term complications as "chronic, lasting for years or the whole life and can even lead to death" (2013: 144). The skin of the human body is the organ that is most exposed. According to Adel Ghorani Azam, Bamdad Raihi Zanjani and Mahdi Balali Mood, "skin is the body's first line of defense against a foreign pathogen or infectious agent and it is the first organ that may be contaminated by a pollutant" (2016: 6). The skin is the largest unprotected organ in the human body that is the first to fight against pollutants. Lowell Goldsmith states that "the skin is a target organ for pollution in which the absorption of environmental pollutants from this organ is equivalent to the respiratory uptake" (1996: 176). The damage that pollutants cause to the human skin is equivalent to the damage caused by pollutants that are inhaled. This means that the pollutants that are inhaled and the pollutants that are absorbed by the skin cause the same amount of damage to the health of humans.

The next human organ that gets affected by the pollutants is the eye. "The eye is a neglected vulnerable organ to the adverse effects of air suspended contaminants even household air pollution" (West *et al*. 2013: 5378-5398). The eye is exposed just like the skin but the eye is more vulnerable to the contaminants that are present in the atmosphere. The eye is important in that we need it to see what is going on around us. In a similar vein, Ghorani-Azam, Riahi-Zanjani and Balali-Mood state that "chronic exposure to air pollutants increases the risk for retinopathy and adverse ocular outcomes" (2016). This in turn leads to the long-lasting eye disease. Some studies have indicated that the dry eye syndrome and irritation of the eyes resulting from pollution are some of the main incidences that lead to blindness (Rozanova, Heilig and Godnic-Cvar 2009: 205-215).

The throat and the nose also get affected. According to Anna Almendraia, "pollutants can affect cardiovascular health by hardening the arteries and increase the risk of heart attack and strokes, and there is even emerging evidence that air pollution may be linked to mental health conditions and degenerative brain diseases such as Alzheimer's disease, Parkinson's disease and schizophrenia" (2018). These are the diseases that one gets through air pollution. Furthermore, "other conditions associated with high levels of air pollution include

emphysema and, as well as lung cancer" (Almendraia 2018). These conditions may even lead to death in the long run. Human and animal health are important for survival. We need to have clean air quality for survival as we need clean oxygen to breathe in. Air that is filled with toxins is not good as it affects the oxygen that we breathe; hence, in this case, we will be breathing both oxygen and toxins.

As outlined above, research by scientists shows strong evidence that high levels of pollution negatively affect the health of humans. According to Carrie Breton, "a growing number of correlative studies have shown that when people move to cleaner regions, or when air pollution levels decrease, health outcomes improve"[9]. Breton, an environmental health scientist from the University of Southern California's (USC) Keck School of Medicine, explains that "USC's Children's Health Study has studied the long-term effects of air pollution on children over the past 25 years and found that kids who move to areas with lower levels of pollution have improved lung function". This means that the people (including children) who live in areas that have low levels of pollution do stand a better chance of not getting sicknesses which are pollution-related.

2.3.6. The Effect of Pollution on the Environment

The environment gets affected in numerous ways due to the pollution and the toxins that are in contact with it. The ozone layer is affected in that it depletes due to the toxins that pierce through it. Given that the ozone layer is being affected, the climate has changed to the point that there is acid rain which negatively affects the wildlife. In view of the above, the gradual depletion of the ozone layer, the effect of acid rain, and the negative impacts of environmental pollution on wildlife are discussed below. Another issue is plastic pollution which will also be discussed.

[9] For more information see: https://www.huffpost.com/entry/what-air-pollution-does-to-your-body_n_5a1a7f47e4b064948074da5f?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAHsps4afqtesDfPL-UGzKGGAehUZ8_YxaoHkqoAFZzXfZnQ7wGRrZrxQpDmJzmk_rsFULJFry3I1LPV76_MfXBWecxljYmPX0TEfuk6wS58lmTIcaFbRlAzyqdCPrjQNpQmAZubhSw4JPfqhggBb1P19wlEIMF2EJW7sSjwUmGH0

2.3.6.1. The Ozone Layer Depletion

The environment gets impacted severely due to pollution and this leads to it being degraded. According to Ahmad Ashfaq and Pratiksha Sharma:

> The stratosphere of the atmosphere has ozone (O_3). Ozone is known to absorb the Ultraviolet (UV) rays present in the sun's radiation and protects us from the harmful effects of the UV rays. However, hydrocarbons such as the chlorofluorocarbons (CFCs) destroy the ozone molecules which deplete the ozone layer. Ozone holes have been detected in the atmosphere which permits the UV rays to reach the earth's surface. The harmful effects of the UV rays are visible in countries such as Australia and New Zealand where the rate of skin cancer is higher than the other regions of the world (2012).[10]

Without the ozone layer to protect the planet from the heat of the sun the earth becomes more heated leading to the ice cap melting. Stephen Gardiner (2011) in his work titled *A Perfect Moral Storm, the Ethical Tragedy of the Climate Change,* argues that climate change must be understood as a moral problem. Climate change is partly because of the depletion of the ozone layer. The increase in the heating of the globe results in the melting of the polar ice caps and this leads to the rise of sea levels. The absorption of CO2 in the planet's atmosphere has increased during the past century (Keeling and Whorf 1997). Excessive amounts of CO2 in the atmosphere has bad consequences for the environment and humans. Too much CO2 in the atmosphere makes it hard for humans and animals to breathe as there is less oxygen available. CO2 is one of the most significant greenhouse elements and appears to be the major contributor to climate change which then results in the depletion of the ozone layer (Balasubramanian 2017: 33-37; also see Garrington 2017; National Geographic 2019). As noted above, without the ozone layer to protect the planet from the heat of the sun the earth becomes more heated leading to the melting of the ice caps.

The CO2 that is being released on the environment affects the flora, fauna and humans. Once it affects these entities, it means that many aspects of the ecosystem can also be affected. The CO2 that is being released firstly disrupts the carbon cycle leading to increasing greenhouse

[10] For further readings go to: www.tutorvista.com.

effects. Environmental pollution also affects the food chain. For example, carbon pollution leads to the alteration of the ocean's chemistry which slows its ability to uptake CO2 thereby making it more acidic and harming shellfish and other aquatic life that we depend on for food. Gardiner states that the greenhouse effects are a direct outcome of air pollution (2018: 61). Thus, the huge amounts of CO2 that get released into the atmosphere are due to the burning of mainly fossil fuels.

2.3.6.2. Acid Rain

Acid rain is a consequence of air pollution which can be detrimental to the environment and it can also have negative effects when it comes into contact with human skin. Ashfaq and Sharma underscore that:

> Sulphur dioxide and nitrogen oxides react with water in the atmosphere producing sulphuric acid and nitric acid. These acids come down along with the rain. This phenomenon is called acid rain. The pH of acid rain varies from 3-6. The composition of acid rain is sulphuric acid, nitric acid and weak carbonic acid. Its adverse effects on the environment include: causes respiratory and skin disorders, affects the productivity of plants by damaging the leaves, enters the soil and affects the soil, pH and causes leaching, enters the ground and river waters which causes harm to the aquatic life, causes damage to marble and thus damages buildings and monuments (2012: 1).

Acid rain has negative effects on the environment in that once the rain touches the soil it (the soil) becomes damaged due to the acidic particles in the rain. It is important to note that the soil is a non-renewable resource and, if not damaged too badly, it takes time to recover from the damage. When the soil gets damaged it also affects the plants because of the rise in the pH level which causes wilting and leaching. The growth of the plant is affected and, in some cases, the plant dies. Acid rain also affects marine life as the rain contains acids which may deplete the oxygen in the water making it hard for marine life to survive. Due to its acidity, the rain also affects infrastructure like buildings and monuments.

2.3.6.3. Wildlife

Wildlife "is burdened by toxic pollutants coming from the air, soil, or the water ecosystem and, in this way, animals can develop health problems when exposed to high levels of

pollutants. Reproductive failure and birth effects have been reported" (Manisalidis *et al*. 2020: 11). Just like humans, animals get affected by the high levels of pollutants in the environment. Poor air quality in the form of a lack of oxygen (which animals breathe in) affects the respiratory systems of the animals. As for marine life, once the water is full of toxins, oxygen is depleted, and marine life gets affected and possibly dies.

2.3.6.4. Marine Life

According to the National Aeronautics and Space Administration (NASA), "about 30 percent of the carbon dioxide that people have put into the atmosphere has diffused into the ocean through the direct chemical exchange"[11]. This means that the CO2 that is expelled to the atmosphere and caused by anthropocentric actions goes directly into the oceans via chemical exchange. NASA further explains that "dissolving carbon dioxide in the ocean creates carbonic acid, which increases the acidity of the water. Or rather, a slightly alkaline ocean becomes a little less alkaline. Since 1750, the pH of the ocean's surface has dropped by 0.1, a 30 percent change in acidity". The water in the oceans, therefore, become acidic and as a result, the marine life gets affected. With acidification, the water gets warmer and this temperature change also affects the aquatic animals and plants.

2.3.6.5. The issue of plastic pollution

According to the World-Wide Fund for Nature (WWF), "plastic is one the most persistent pollutants on Earth" (2019). This is because plastics also contribute to GHG emissions. Furthermore:

> Almost all plastic is derived from materials (like ethylene and propylene) made from fossil fuels (mostly oil and gas). The process of extracting and transporting those fuels, then manufacturing plastic creates billions of tonnes of greenhouse gases. For example, 4% of the world's annual petroleum production is diverted to making plastic, and another 4% gets burned in the refining process (WWF 2019).

[11] See the article at: https://earthobservatory.nasa.gov/features/CarbonCycle/page5.php#:~:text=Eventually%2C%20the%20land%20and%20oceans,carbon%20cycle%20impact%20each%20reservoir.&text=Excess%20carbon%20in%20the%20ocean,putting%20marine%20life%20in%20danger.

Plastics manufacturing is an issue as it not only affects marine life and humans but also increases carbon emissions. Plastics SA highlights that "South Africa currently recycles 21% of plastics consumed in the country (including plastics exported for recycling), while the remainder is disposed of in landfills" (2016a). Disposed plastics are the ones that are harmful to the environment. With that in mind "between 15 000 and 40 000 tonnes of plastic is carried to the oceans from South Africa per year" (Verster and Bouwman 2020: 1). Marine life gets affected as plastics in the oceans "provide the largest natural carbon sink for greenhouse gases, plastic leaves a deadly legacy. It directly chokes and smothers a host of marine animals and habitats and can take hundreds of years to break down" (WWF 2019).

One may ask how plastic pollution contributes to the global issue of climate change. To answer this the WWF points out that "sunlight and heat cause the plastic to release powerful greenhouse gases, leading to an alarming feedback loop. As our climate changes, the planet gets hotter, the plastic breaks down into more methane and ethylene, increasing the rate of climate change, and so perpetuating the cycle" (WWF 2019). Plastic pollution is as much of a problem as any other carbon-based pollution. As South Africa only recycles 21% of its plastics, more fossil fuels will be needed to produce more plastics. This will lead to an increase in GHG emissions which will not help in mitigating climate change and lowering environmental pollution.

2.3.7. The Effect of Environmental Pollution on the Economy

Environmental pollution harms the economy. According to Sipho Kings, "air pollution kills 20 000 people in South Africa every year, costing the economy nearly R300 million" (2016). Kings further explains that "besides the cost of missing work, people also have to spend money staying healthy by buying things such as asthma medication. This cost is also carried by the state" (2016). South Africa is a developing country. Many people live below the poverty line and, as such, they go to public hospitals where the state provides the medication needed. In other words, the state pays for their hospital bills. According to the Averda South Africa, "it is estimated that 7.4% of all deaths in South Africa can be attributed to polluted air, which costs the nation 6% of its gross domestic product (GDP)" (2019). Due to the effects of air pollution, a lot of money is spent on medication for sick people. An example is asthma

medication for those people that have respiratory problems. Millions are spent in getting asthma medication to hospitals and clinics to help the people of South Africa who suffer from the condition. Doing so, therefore, affects economic development as the state has to spend nearly R300 million on asthma medication alone.

2.4. Conclusion

This chapter has highlighted the literature that is relevant to the dissertation. The literature reviewed included journal articles, books and websites. The key point noted in this chapter is that carbon emissions have been identified as an important cause of environmental pollution leading to the issue of climate change. The problem of GHGs has put the world on alert. South Africa has implemented carbon tax legislation as a means to curb and mitigate the impacts of climate change and environmental pollution and to lower its carbon footprint. However, the country still largely depends on burning fossil fuels to generate electricity. This causes major damage to the environment leading to the air quality being affected and to a higher carbon footprint. This in turn this leads to climate change which affects many aspects of the environment.

This chapter thus evaluated what scholars have said about environmental pollution and climate change. It presented the literature review thematically. The chapter first defined and discussed environmental ethics and the African view of environmental ethics. It then discussed Segun Ogungbemi's understanding of the environmental crisis. Third, it discussed environmental pollution, the different types of pollutants (highlighting the different categories of environmental pollution) and the effects of environmental pollution on humans and non-humans including the issue of climate change.

Chapter Three follows. It provides an overview of carbon tax starting with a definition of carbon tax and then proceeds to discuss the carbon tax policy in South Africa.

Chapter Three

An overview of Carbon Tax

3.0. Introduction

The previous chapter comprised an ethical overview of environmental issues as reflected in the literature. More specifically environmental pollution and climate change were discussed. This chapter focuses on a mechanism to help minimise such pollution and climate change, namely, a carbon tax. The chapter discusses what carbon tax is and then examines the carbon tax policy in South Africa.

3.1. What is Carbon Tax?

Joseph Aldy, Eduardo Ley, and Ian Parry state that "the alternative instruments most favored by economists for controlling emissions of GHGs are CO2 taxes and systems of tradable CO2 permits" (2008: 1). Economists maintain that carbon pricing, mainly using the method of a carbon tax, is the climate policy that has the smallest fee system to reduce GHG emissions. According to Kimberly Amadeo, "a carbon tax is a fee that a government imposes on any company that burns fossil fuels. The most widely discussed are coal, oil, gasoline, and natural gas" (2019: 1). A carbon tax aims to reveal the actual costs of carbon emissions. A carbon tax is a "market-based approach to confining emissions within a specified budget" (Garnaut 2007: 10). Taxation can take place at various points, from the processing point up to the point of combustion just before the CO2 is discharged. According to Ian Parry:

> While addressing climate change by reducing greenhouse gases, carbon taxes can also generate more immediate environmental and health benefits, particularly by reducing deaths that result from local air pollution. They can also raise significant revenue for governments, revenue they can use to counteract economic harm caused by higher fuel prices (2008).

The above are some of the benefits of a carbon tax. Another example is that carbon tax revenue can be used to fund productive investments to accomplish the United Nations Sustainable Development Goals (UNSDG), which focus on reducing poverty, environmental degradation and inequality. The carbon tax is calculated per ton; each and every CO2

emission is measured and one then pays for it per ton. Every company is required to file and report on the amount of carbon they emit into the environment.

Patrick Criqui, Mark Jaccard and Thomas Sterner state that carbon tax is seen by most economists as the central dimension of any climate policy (2019: 6280). An indication that carbon tax may be effective in weakening carbon pollution, Margery Stapleton, Helena Lenihan, Sheila Killian, Breda O'Sullivan, and Kemmy Business maintain that carbon tax can be "effective in influencing taxpayer behavior" (2006: 23). The inference from this quote is that a carbon tax is a good step towards sustainable development because the assumption is that the tax generated will assist in shifting the behaviour of carbon emitters.

Ethicist Michael Sandel, in his book titled *It's Immoral to Buy the Right to Pollute,* argued that "relying on putting a price on carbon to achieve a government's obligations is ethically problematic without regard to the details of the pricing scheme" (1997: 20). The main question is: Can we pay back the non-renewable resources? An ethical approach to climate change also requires that polluters should pay for the harms and damages they create as well as the costs associated with reducing the pollution (Brown 2010: 3). Carbon tax schemes ignore the duty of GHG emitters to compensate those who have been harmed by their GHG emissions. The amount of the tax owed is based on the amount of money needed to reduce GHG emissions and, as mentioned, compensation of those harmed is disregarded.

3.2. Carbon Tax Policy in South Africa

Melissa Strydom and Carmen Bradfield indicate that "carbon tax is South Africa's most far-reaching and substantial response to climate change to date" (2019: 1). According to the National Treasury, "the primary objective of the carbon tax is to reduce greenhouse gas (GHG) emissions in a sustainable, cost-effective and affordable manner" (2019: 1). This is so because the emission of GHGs due to CO2 emissions and the burning of fossil fuels, is one of the factors behind climate change and climate change is considered as one of the biggest challenges facing humankind.

Extreme carbon emissions are recognised as an essential cause of global warming (Meinshausen *et al*. 2009) and the issue of GHG effects has drawn global attention. Climate

change is a long-term concern that compels substantial mitigating action involving complex interactions between environmental, economic, social, technological, and political processes (Sathre and Gustavsson 2007). In order to limit national emissions of GHGs, the South African authorities proposed the introduction of a carbon tax policy from January 1, 2015.

This policy, which is in accordance with the Kyoto Protocol to which South Africa is a signatory, aims to limit the emission of GHGs and halt the trend of climate change and environmental pollution. According to the World Wide Fund for Nature (WWF):

> A carbon tax is a way for government to put a price on carbon emissions, and to shift the costs from society to those companies that are creating the emissions. The more a company emits, the more tax it must pay. The more action a company takes to reduce its emissions, or if it is by nature low carbon, the lower its tax (2019).

The policy above was signed into law by the South African President, Cyril Ramaphosa, in May 2019. This law is important in South Africa as it is a first step towards curbing the issue of carbon emissions and to limit the effects of environmental pollution which, in turn, lead to the ongoing issue of climate change.

A carbon tax is a tax on CO2 emissions which are caused by the combustion of fossil fuels. Michael Fakoya explicates that "in South Africa, a carbon tax is a tax per ton of CO_2, since CO_2 is the substance of interest and not the carbon itself" (2013: 40). Taxing CO2 per ton is for the effective raising of revenue whilst ensuring that the emission of CO2 is reduced.

According to the National Treasury, "the Carbon Tax Act gives effect to the polluter-pays-principle for large emitters and helps to ensure that firms and consumers take the negative adverse costs (externalities) into account in their future production, consumption and investment decisions" (2019: 1). A carbon tax encourages companies to start looking for new approaches on how they can operate with carbon clean technologies. This will not only benefit the present generation but future generations as well.

3.2.1. Government and Carbon Tax

As noted above, the carbon tax law is new in South Africa and, therefore, it requires the

government to be at the forefront. Jane Andrew, Mary Kaidonis and Brian Andrew support this, asserting that "indeed the carbon market needs government legislation, regulation and related infrastructure to be established" (2010: 614). It is the government that needed to develop legislative measures to set up a carbon tax on measurements of GHGs. The authors further state that "government intervention is required to ensure the fundamental legitimacy of market-based approaches to emerging social and environmental issues" (Andrew, Kaidonis and Andrew 2010: 614). The presence of the government is important as there is a need for the management, monitoring and control of the amount of damage that the carbon does to the environment. The management, monitoring and control assist in the integration of the environment, the economy and the society for improved sustainable development.

3.2.2. Carbon Tax and Customers

The purpose of a carbon tax policy is to lessen CO2 emissions from the use of fossil fuels, especially on electricity and transport fuel consumption. The policy aims to offer incentives for consumers and organisations to find alternatives for those goods with high carbon concentrations and to move towards goods with low carbon concentrations (Creedy and Sleeman 2006). Customers pay the tax in the form of a customer price index (CPI). They pay through the goods and services they purchase. The South African government accentuated that the carbon tax policy will increase the price of energy because energy, as an essential good in production and household consumption, contributes significantly to the carbon emissions footprint. A carbon tax can be considered as "backsliding" because it can cause harm that is out of proportion to low-income recipients and marginalised families (Callan *et al*. 2009). According to Michael Fakoya:

> This means that a carbon tax-induced price changes will give rise to excess burdens on the poorer and low-income earning households, as well as impose adverse impacts on the distribution of government welfare programmes. A higher price increase for carbon-intensity goods, which form a larger proportion of these households' budget, can lead to increased inequality among the groups within the economy (2013: 38-39).

Fakoya is of the view that the implementation of a carbon tax policy leads to most companies escalating the prices of their goods and services and this affects marginalised people. The prices that are passed on to customers will have a negative impact as they will be a burden

to low-income recipients and also to poor households. South Africa is a developing country and many people live in situations that are below the poverty line. Thus, in view of the above, the questions that come to mind are: As ethical agents what are our duties towards environmental health? Is it ethical for companies to increase the prices of carbon-intense goods? Does this mean that the marginalised must not play any part in contributing to the lowering of carbon emissions?

As ethical agents, we all have to take responsibility for our actions whether we are living below the poverty line or not. When it comes to environmental pollution and working towards sustainable development, no-one should be side-lined. If one pollutes the environment, he or she should be held responsible for the damage caused to the environment. Fakoya further argued that:

> Policymakers need to consider whether it is beneficial to implement a carbon tax policy that would lead to job losses, further impoverish the poor through high CPI, provide producers opportunity to adapt to the new tax liability by shifting the burden to the consumer rather than innovate and invest in low carbon technologies (2013: 35).

Fakoya argues that policymakers should consider jobs and the poor before implementing a carbon tax policy. He also suggests that a carbon tax should provide producers some time to adapt to the new tax charge or responsibility through a high customer price index (CPI). The producers will adapt by shifting their burden to consumers instead of quickly shifting and investing in low carbon technologies. An implication of this is that consumers will bear the burden of indirectly paying the tax for the company. This appears to be unfair to the consumers and questions the company's initial consideration of customers who are poor. The company should seek a balance or broker a deal between them and the consumers concerning the carbon tax payment. In this situation, both the company and the consumers will contribute or have a part to play in achieving sustainable development for the benefit of future generations. Consequently, it is necessary to ask the question: Is a carbon tax an ethical strategy for South Africa to meet its commitment to reducing GHG emissions?

There is a problem with a carbon tax policy being used as a means to curb environmental pollution and climate change. The problem lies in the fact that the policy is focused more on

firms and not on individuals. As noted in the discussion above, individuals (referred to as customers), pay their carbon tax in the form of a CPI. Given that as individuals we produce emissions directly, I am inclined to think that individuals should be charged directly since a carbon tax policy is a direct measure to, as mentioned, curb environmental pollution and climate change. I would like to underscore that my intention is not to determine the measure or extent by which individuals should be taxed but rather to argue that individuals should be taxed directly.

The National Treasury, referring to the carbon tax policy paper on reducing GHG emissions and facilitating the transition to a green economy, stated that:

> The aim of the proposed carbon tax is to correct the existing prices of goods and services that generate excessive levels of anthropogenic GHG emissions so that it reflects the social costs of such emissions. GHG emissions accumulate in the atmosphere, which means that current emissions will contribute to the stock of emissions and so exacerbate the greenhouse effect (2013: 15).

The policy seeks to change the behaviour of firms and customers with regard to sustaining the environment. This is done by taxing the emitters for their anthropogenic emissions in the form of a social cost. The GHG emissions not only affect human beings but the flora and fauna as well. The carbon tax policy is a market-based regulatory measure that is used to control the behaviour of both firms and customers. It seeks to internalise exterior costs allied with extreme GHG emissions by regulating relative prices in order to imitate the social costs of carbon-intensive goods and services. An efficient tax requires that the tax base be as broad as possible, covering as many GHGs and sectors as is practically feasible. A carbon tax is designed to discourage high carbon emissions in industrial and household activities so as to promote efficient carbon reductions throughout the economy.

3.2.2.1. The Meaning of the Polluter Pays Principle (PPP)

Section 24 of the South African Constitution (1996) states that everyone has the right to:

> (a) an environment that is not harmful to their health or well-being, and
>
> (b) to have the environment protected, for the benefit of present and future

> generations, through reasonable legislative and other measures that:
>
> (i) prevent pollution and ecological degradation,
> (ii) promote conservation, and
> (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development (1996).

In South Africa, persons have the right to an environment that is clean and protected. The National Environmental Management Act (NEMA) has been designed in the context of the Constitution. The NEMA is an umbrella of other environmental laws and promotes sustainable development. Most importantly, the Act promotes the polluter pays principle (PPP). The key objective of the PPP is the conservation and sustainability of the ecosystem. According to Oversea Nabileyo, "the principle is a measure aimed at the prevention of pollution and environmental degradation" (2009: 9). This is indicated in Section 24(b) (ii) of the Constitution. Section 24 guides the government in adopting procedures that guarantee that the remediation of ecological harm takes place. Section 2(4) (p) of the NEMA represents the PPP and stipulates that: "the costs of remedying pollution, environmental degradation and consequent health effects must be paid for by those responsible for harming the environment" (1996). The PPP is a vital foundation of environmental commandments.

The PPP was encompassed in the *Rio Declaration* as Principle 16 (Heath and Environmental Linkages Initiative (HELI) 2020). The principle highlights that the cost passed on to society and the environment by pollution must be acknowledged by the polluter. The PPP is usually recognised as an economic principle intended for customer protection (Nabileyo 2009). The motive for describing it as an economic principle is because the principle has cost implications for the polluter. The principle can also be useful when enforcing sanctions for unlawful conduct or commanding the right methods to restore a certain environmental resource to its natural state. The PPP also functions as a guide to the conduct of possible contaminators. Nabileyo further underscores that:

> The elements of wrongfulness are crucial in the expansion of liability to novel situations, but section 24 of the Constitution may facilitate new developments in the environmental field, which may provide a technique for internalising environmental and other social costs into production processes and other activities in the implementation of the polluter pays

> principle. In fact, liability rules in relation to environmental pollution are still evolving at both national and international levels. Section 28 of NEMA refers to the polluter pays principle. It is accordingly the objective of this study to examine the environmental liability provisions as included in section 28 of NEMA as well as the role of the polluter pays principle (2009).

The PPP provides a system which the polluters have to abide by and covers the social and environmental costs in monetary terms. The rules on environmental pollution are evolving from the national level to the international level. Many countries are now fighting for environmental sustainability and protection. In simple terms, the principle is about the payment made for damage done to the environment by a polluter. Given this, the questions which come to mind are: When we consider this principle, can we really pay for the damage that we caused to the environment? How much needs to be paid so that the damaged natural resources can recover?

The PPP proposes that it is the polluter's responsibility to implement prevention and control measures as a way of paying for the damage he/she has caused to the environment. This is done regardless of "whether these costs are incurred as a result of the imposition of some charge on pollution emission or are debited through some other suitable economic mechanism" (Nayibeni 2009). The polluter must bear the consequences of the damage that they have caused to the environment in that they have to take an ethical responsibility in making sure that the environment is kept clean and sustained. The PPP is more of an economic instrument that stipulates inducements which govern the behaviour of polluters and it also enables the polluter to know their duties towards the environment.

3.2.3. Design of the Carbon Tax Policy in South Africa

In South Africa, the carbon tax policy is designed differently to other countries which have implemented such a policy. Since it is a new policy, it is designed according to phases and within these phases, different approaches are applied. This is discussed below.

3.2.3.1. Phases

According to the National Treasury, the "carbon tax will initially only apply to scope 1 emitters in the first phase. The first phase will be from 1 June 2019 to 31 December 2022,

and the second phase from 2023 to 2030" (2019: 1).[12] Mark Hewitt corroborates this when he says that "the third phase is expected to be effective from 2031, with no sunset clause currently enacted" (2019). This, therefore, means that there are three phases and, in these phases, different methods and principles will be used for the GHG emitters to be able to pay the tax. The first phase will last for four years and from there the second phase will start and last for eight years, after which the third phase will follow. It has not been stated how long the third phase will operate for.

The above will be achieved by placing a uniform price of R120 per ton of CO2 emissions, regardless of the emissions source, whether from electricity production or fuel consumption from transportation (Government Gazette 2019). Since a carbon tax would lead to higher prices for a carbon-intensive organisation's goods and services, development and investment in innovative and efficient renewable energy and carbon sequestration or other technologies would be a potentially rewarding venture. This, therefore, means that organisations need to increase their spending on research and development costs for cleaner energy and technology.

3.2.3.2. Measuring emissions

In South Africa, the amount of carbon tax is measured differently from other countries that have implemented carbon tax policies. In South Africa:

> Emitters will instead have the option to use the 'emission factors' established by the Intergovernmental Panel on Climate Change. These are factors that give an approximation of greenhouse gasses emitted depending on how much fuel was combusted, or product was produced. Over time, more accurate domestic emission factors will be developed for use in South Africa. [13]

Whilst having a joint capacity over the threshold, when one's actions are subjected to a carbon tax, one is required to only pay tax on the actual emissions. However, emissions are

[12] For more on this go to: www.treasury.gov.za.

[13]For more information see: https://www2.deloitte.com/za/en/pages/tax/articles/what-the-new-carbon-tax-means-for-SA-industry.html

both difficult and expensive to accurately measure. This in turn raises an ethical question: Who determines or monitors if the emissions are measured correctly? The domestic emissions cannot be accurately measured, and this makes it an ethical issue as we all have to take responsibility for the sustainability of the environment.

3.2.3.3. In what way is the Carbon Tax Liability Calculated in South Africa?

The South African Revenue Service (SARS) states that "the first phase has a carbon tax rate of R120 per ton of carbon dioxide equivalent emissions" (2020). The rate will rise yearly and according to the National Treasury, the rate will be "by inflation plus 2 per cent until 2022, and annually by inflation thereafter" (2019: 3). This means that the price or percentage that is expected to be paid by the emitters will increase as the years go by. The SARS states that "important industry specific tax-free emission allowances varying from 60 percent to 95 percent … will come into effect in a modest net carbon tax rate varying from R6 to R48 per ton of carbon dioxide equivalent emission" (2020). This aims to offer existing emitters sufficient time to change their actions to green and sustainable technologies through investments in renewables, various low-carbon measures and energy efficiency.

3.2.3.4. Allowances

The new carbon tax policy comprises several arrangements which are meant to reduce the carbon emissions burden. Included in these arrangements are various "allowances" in the first phase. These include allowances for fossil fuel combustion, industrial process emissions, fugitive emissions, trade exposure, performance, carbon budgeting and carbon offsetting (Deloitte Digital 2019; Carbon Tax Bill 2018: 9 and National Treasury 2018). These allowances provide aid to companies and firms so that they are not impacted by the carbon tax policy immediately. According to Deloitte "60 percent allowance for all emissions and an additional 10 percent allowance for process and fugitive emissions. There are four additional allowances which taxpayers can access depending on whether they meet the necessary requirements" (2019). This means that the taxpayers get a 60 percent allowance for the emissions that they cause plus another 10 percent for the methods they use to reduce the emissions. Other allowances that follow are based on whether the polluters do what is expected of them. The four most significant allowances are:

> The first is the trade exposure allowance of up to 10 percent, which is dependent on how trade exposed the sector is in which a company operates.
>
> The second additional allowance is the performance allowance, in terms of which you can claim a 5 percent allowance if your processes are less emission intensive than a benchmark.
>
> The third, the carbon budget allowance, similarly provides for an allowance for those who have voluntarily participated in the development of a carbon budget with the Department of Environment, Forestry and Fisheries (DEFF). Department of Environment, Forestry and Fisheries (DEFF) is in the procedure of developing a carbon budget system and intends to make it mandatory for large emitters to have a carbon budget under the National Climate Change Bill. Alignment between these two mechanisms is still under review to avoid a double penalty.
>
> Finally, the carbon offsets allowance makes provision for an allowance for those that invest in emission reducing projects. Projects that reduce emissions in South Africa, but are not directly subject to carbon tax, may be able to register the emissions reductions as carbon offsets. These can then be purchased by carbon taxpayers and retired to reduce the amount of emissions they are liable to pay tax on (Deloitte 2019; Carbon tax bill 2018: 9 and National Treasury 2018).

These allowances will, primarily, offer some relief from the carbon tax. However, it is not clear at this stage as to how long they will persist. The government has specified that "the impact of the carbon tax will be reviewed before the next phase is implemented (2023) and changes to rates, thresholds and allowances made thereafter" (National Treasury 2018: 1). The allowances are awarded to the carbon taxpayers who comply with the rules and regulations of the policy and the aim of which is to lower the impacts of the carbon emissions. This means that although the new carbon tax policy is embarking on a fairly low price or percentage, the intention is to increase the price or percentage over time. These increases could eventually prove to be burdensome in the later stages.

According to Deloitte[14], "the allowances, as well as a rebate for the Environmental Levy for fossil fuel electricity generation and a renewable energy premium, is intended to neutralize the impact of the carbon tax on Eskom" (2019). While these allowances are categorised into phases, electricity prices may be significantly affected by the carbon tax policy. However,

[14] See: www.deloitte.com

all things considered, it is clear that the motive of the policy is that environmental responsibility becomes the new normal for South Africans. With this in mind, firms should begin to look for new innovative ways to decrease their level of carbon emissions in order to avoid the risk of penalties in the future.

3.3. Conclusion

The chapter briefly explored what carbon tax is and what it means in the South African context. It further explained and discussed the structure of the policy in terms of the South African context. By doing so, it provided a deeper understanding of the policy including aspects such as allowances, phases and how emissions are measured. The main reason for the chapter was, therefore, to offer an understanding of the carbon tax policy from the South African point of view.

The following chapter (Chapter Four) focuses on the theoretical framework. The ethical theories that guided the study, namely, environmental stewardship and sustainable development will be discussed. Environmental stewardship and sustainable development are both used as a lens to understand environmental pollution and climate change and to evaluate carbon tax as a means to reduce GHG emissions from an ethical perspective. The theories are used to analyse and investigate carbon tax as a means to reduce environmental pollution and climate change. Similarly, they are used to recommend what ought to be done.

Chapter Four

Theoretical Framework

4.0. Introduction

The previous chapter discussed the carbon tax (policy) in South Africa. The main aim of the chapter was to explain what carbon tax is and to explain the views of different scholars who have engaged on the subject. Building on from the previous chapter, the current chapter comprises the theoretical framework. In this chapter, I discuss the theories that guided the study. Carbon tax as a strategy that has been implemented in South Africa to lower GHGs will be viewed through the lens of the ethical theories of sustainable development (SD) and environmental stewardship. The reason for this is to ethically interrogate the payment of a carbon tax as a means to reduce GHG emission in South Africa. The theories aim to support and show that we have a responsibility to sustain the environment. I will, therefore, use these theories to describe the current situation we are facing because of climate change and environmental pollution. I will also prescribe a way forward.

This chapter is divided into three sections: The first section looks at the ethical theory of sustainable development and the South African understanding of the concept. The second section explores the ethical theory of environmental stewardship. The third section briefly discusses the connection between sustainable development and environmental stewardship. The chapter ends with a conclusion.

4.1. The Ethical Theory of Sustainable Development

In this section, I discuss the general idea of sustainable development and emphasise the importance of long-term impacts on the development processes. To achieve this, I will define the ethical theory of sustainable development, discuss how the term sustainable development came about and the complexities of the theory. The section underscores the numerous positions and viewpoints of the scholars who have written about the theory. Also, in this section, the pillars, principles and methods of the theory are discussed in the light

of a carbon tax payment as a means to reduce GHG emissions in South Africa. Finally, the section highlights the arguments for and against the theory.

4.1.1. Sustainability and Development

Sustainability and development are two fundamental terms constitute the ethical theory of sustainable development. According to Sharachchandra Lele, "development and sustainability could be in the juxtaposition, where both could have possible counterproductive effects, while neoclassical economists emphasize that there is no contradiction between sustainability and development" (1991). In a similar vein, Wolfgang Sachs states that "there is no development without sustainability or sustainability without development" (2010: 28). What the above ideas show is that the two terms work interchangeably there will not be development without sustainability and vice versa. Even though the two terms mean different things when separated, when combined they are powerful. Each is discussed below.

According to Joe Remenyi, "development is a process whose output aims to improve the quality of life and increase the self-sufficient capacity of economies that are technically more complex and depend on global integration" (2004: 22). This means that the modern understanding of development aims at improving the quality of life through economic growth and technological advancement. According to Sikandar Tangi (2005), the main aim of development is to create a stimulating environment where people will adore and have a healthy, safe, long and innovative life. Sharachchandra Lele defines development as a "process of targeted change, which includes goals and resources to achieve these goals" (1991: 609). Alan Thomas states that "development involves the positive changes that society has experienced throughout history, and still experiences" (2004). On the other hand, Richard Sharpley asserts that development "outlines the plans, policies, programmes and activities undertaken by certain institutions, governments and other governmental and non-governmental organizations" (2009: 30). The most recognised development guide is the Human Development Index (HDI) that assimilates diverse kinds of socio-cultural, economic, ecological and political development (Willis 2005; see also United Nations Development Programme (UNDP) 2015; World Bank (WB) 2015).

The term sustainability is defined as "a capacity to maintain some entity, outcome, or process over time" (Jenkins 2009: 380). This simply means that sustainability is preserving an entity without damaging the natural state of the entity or exhausting the resources that the entity depends on. This definition of sustainability is a general understanding of the term and, given this, the "meaning can be placed analogously to all human activities and business processes" (Klarin 2018: 69-79). Concurring with the overall meaning, everything we do as humans concerning the environment and business involves sustainability. The term has the capacity, in its numerous variations, to not include the exploitation of the environment but rather incorporate a longstanding healthy and safe approach to it. In a similar vein, Jenkins states that "Natural systems enable people to live and support the outcomes of human activities, therefore sustainability can hardly be considered without an ecological aspect" (2009; see also Sachs 2010; Shiva 2010).

4.1.2. Sustainable Development: Defining the Theory

The awareness of sustainability has been present for more than 30 years and it has been developed by the International Union for Conservation of Nature (IUCN) in 1963 (Adams 2006; see also IUCN 1980). The Brundtland report describes sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987: 43). In a similar vein, Remigilus Ciegis and Dalla Streikiene argue that "sustainable development merges two urgent goals, namely ensuring appropriate, secure, and healthy lives for all people which is the goal of development; and living and working in accordance with bio-physical limits of the environment which is the goal of sustainability" (2005: 7). This means that when considering development in an area one must consider the carrying capacity of the environment and reflect on the impact the development may have on the environment. It further means that when, for example, one wants to develop a company's machinery, one must consider the amount of GHGs released into the atmosphere by the machinery. This is because too many toxins in the atmosphere cause tremendous damage not only to the environment but also to the society and the economy.

When we connect sustainable development with the carbon tax policy, we will notice that

the aims of both are not far apart. Just like sustainable development, the carbon tax policy is also used as a means to guide people to change their behaviours by developing strategies which will be environmentally sustainable. However, sustainable development comes across as difficult to apply in the modern world. This is because the theory is multidisciplinary. It can be used in different fields including geography, ecology, public policy and politics. As such, sustainable development has numerous definitions and means different things to different people. Robert Repetto defines sustainable development as:

> The concept that current decisions should not damage the prospects for maintaining or improving living standards in the future...This implies that our economic systems should be managed so that we live off the dividend of our resources, maintaining and improving the asset base so that the generations that follow will be able to live equally well or even better (1985: 10).

In terms of the above definition, sustainable development stresses that the present generation must consider the wellbeing of future generations when developing policies and other kinds of development activities. Repetto argues that the decisions that we make today must not hinder future generations from living a healthy lifestyle. Contributive decisions (as opposed to undesirable ones) which will assist in improving future generations' lifestyles are needed. Thus, any development strategy adopted should be mindful of future generations so that they can also live healthy and clean lives.

As noted above, sustainable development is defined differently by different scholars. Table 1 below provides a sequential outline of the meaning of sustainable development from 1987 to 2015.

Table 1: Sequential outline of the meaning of sustainable development from 1987 to 2015.

Author and Year	Meaning of Sustainable Development
WCED 1987	"Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs".
Pearce *et al*. 1989	"Sustainable development implies a conceptual socio-economic system which ensures the sustainability of goals in the form of real income achievement and improvement of educational standards, health care and the overall quality of life".
Harwood 1990	"Sustainable development is an unlimited developing system, where development is focused on achieving greater benefits for humans and more efficient resource use in balance with the environment required for all humans and all other species".
IUCN; UNDP and WWF 1991	"Sustainable development is a process of improving the quality of human life within the framework of carrying capacity of the sustainable ecosystems".
Lele 1991	"Sustainable development is a process of targeted changes that can be repeated forever".
Meadows 1998	"Sustainable development is a social construction derived from the long-term evolution of a highly complex system – human population and economic development integrated into ecosystems and biochemical processes of the Earth".
PAP/RAC 1999	"Sustainable development is development given by the carrying capacity of an ecosystem".
Vander-Merwe and Van-der-Merwe 1999	"Sustainable development is a programme that changes the economic development process to ensure the basic quality of life, protecting valuable ecosystems and other communities at the same time".
Beck and Wilms 2004	"Sustainable development is a powerful global contradiction to the contemporary western culture and lifestyle".
Vare and Scott 2007	"Sustainable development is a process of changes, where resources are raised, the direction of investments is determined, the development of technology is focused and the work of different institutions is harmonized, thus the potential for achieving human needs and desires is increased as well".
Sterling 2010	"Sustainable development is a reconciliation of the economy and the environment on a new path of development that will enable the long-term sustainable development of humankind".
Marin *et al*. 2012	"Sustainable development gives a possibility of time unlimited interaction between society, ecosystems and other living systems without impoverishing the key resources".
Duran *et al*. 2015	"Sustainable development is a development that protects the environment because a sustainable environment enables sustainable development".

Source: Klarin (2018).

The Brundtland Commission developed the concept of sustainable development. Centred on the report, *Our Common Futures* (1987), the Brundtland Commission (also known as the World Commission on Environment and Development (WCED)) described sustainable development as:

> Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development is a process of change in which the exploitation of resources, the direction of investment, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations (WCED 1987: 43-46).

The above definition has been used by many reviewed studies to describe what sustainable development means. These studies include: United Nations General Assembly (1987: 43); Michael Grubb *et al*. (1993); John Dernbach (1998); Jonathan Harris (2000); Pontus Cerin (2006) and Hannah Stoddart (2011). The description gives an idea of what sustainable development is about and emphasises the importance of long-term consideration in development strategies. This means that in any development strategy we choose to use we must not be myopic; rather, we should deliberate the long-term consequences of our actions. The Brundtland Commission outlined the social, economic and environmental concerns that are present within modern society and emphasised the importance of sustainable development.

One thing that the definitions in Table 1 above have in common is the need for the preservation of the environment. Furthermore, the definitions also consider the three pillars of sustainable development, namely, the environment, the economy and the society. The environment, society and economy ought to be integrated and balanced and one must not supersede the other. This is to ensure the wellbeing of both present and future generations. These definitions and that of the Brundtland Commission provide a framework or guidelines for how development activities should be conducted. However, the fears raised by the Brundtland Commission not only concern the economy, society and the environment, but also ethical issues. For example, the relationship between present and future generations; the expression of fears around unrestrained forms of economic

development; and the connection between societies and ecosystems can all be understood in the realm of ethical discourse. It is important to underscore that sustainable development assimilates economic, social and environmental policies into the modern development paradigm.

According to Ernst Conradie, "sustainable development has become a value which serves as an important corrective against expansionists' notions of economic growth that disregard the environmental impact of such economic activities" (2008: 36). Stone Carpenter concurs stating that "current practices, whether taken out of necessity or choice, can irreversibly alter human and natural environments, closing off options for future generations and potentially threatening the viability of the biosphere for human life itself" (1998: 275). Given this, I am inclined to think that the only way that we can preserve the environment for the present and future generations is through embracing sustainable development. This includes the integration of the three pillars of sustainable development. This integration is needed to come up with well-polished solutions for such development.

As outlined above, an important aspect of the theory of sustainable development is that it includes different pillars, namely, society, the economy and the environment in order to achieve sustainability. Lele argues that "the phrase sustainable development covers a complex range of ideas and meanings" (1991: 608). Sustainable development does not only look at the present situation but sees the need to sustain the environment for future generations as well. Thus, the integration of the pillars and other components is important to develop solutions that will help everyone and every discipline. The pillars are discussed in detail below.

4.1.3. The Three Pillars of Sustainable Development

According to the Brundtland Commission, sustainable development represents an integration of the three pillars. It highlights the importance of interdependence that occurs between these pillars and, consequently, it does not prioritise one pillar over the other. Sustainable development recognises and emphasises the integration of the three pillars for a good outcome. The framework is demonstrated in numerous distinct ways and this study looked at the framework in the form of a Venn diagram as illustrated in Figure 1below.

Figure 1: Three Pillars of Sustainable Development.[15]

The figure above highlights the three pillars and in each circle of the pillar, there is a brief explanation of what the pillar is about. More detail concerning each of the pillars follows.

4.1.3.1. Environment

The first pillar (circle) in Figure 1 is the environment. The environment pillar looks at the natural resources used and ensuring that there are environmental management and pollution hindrance (of water, air, and land) to ensure they are preserved. The natural resources from the environment are valued and they need to be protected from exploitation and extinction (Bartelmus 1994). Jonathan Harris maintains that "an environmentally sustainable system must maintain a stable resource base, avoiding over exploitation of renewable resources or environmental risk functions; and the depletion of non-renewable resources only to the extent that investment is made in adequate substitutes. This includes the maintenance of biodiversity, atmospheric stability, and other ecosystem functions not ordinarily classed as

[15] Source: https://images.app.goo.gl/FdgguFoddV4ni3CC6.

economic resources" (2000: 5). This means that a system of environmental sustainability is about environmental protection and ensuring that the environment is kept in its natural state.

According to the International Institute of Environment and Development (IIED), the "development process, if it is to yield lasting results, has to safeguard life-support systems; use renewable resources within their regenerative limits; and respect the capacity of ecosystems to absorb and break down wastes" (2002: 19-20). An example to support this statement is the implementation of a carbon tax policy. Such a policy is there to change the behaviour of polluters and for them to seek new green machinery which lessens the damage which carbon emissions cause to the environment. A carbon tax policy is a sustainable development strategy to decrease the impacts of carbon emissions. An important question to ask is: Can sustainable development assist carbon tax in decreasing the emissions rate?

Sustainable environmental development means that there is the preservation of the environment through the management of the air, land and water quality as well as better strategies to effectively manage waste and pollution. It also includes respect for and protection of fauna and flora and ensuring that there are sustainable measures taken to protect the natural resources. Environmental sustainability, therefore, poses challenges to policymakers to formulate policies that not only benefit human beings but that, considering the importance of the environment, benefit the environment too.

4.1.3.2. Economy

The second pillar (circle) in Figure 1 is the economy. As indicated in the figure, sustainable economic development encompasses economic profit, growth, cost savings and lastly, research and development. Sustainable economic development necessitates "acknowledging natural capital scarcity while producing a continual supply of goods and services" (Bartelmus 1994). Peter Bartelmus is of the view that sustainable economic development is about taking into consideration or recognising that natural capital has some shortcomings when producing goods and services. According to the IIED, the economic pillar "uses the market to signal the relative scarcity of goods and services and creates a robust economy that can serve as the foundation for social and environmental progress"

(2002: 19). This means that sustainable economic development is guided by appropriate policies and regulations and fair distribution and access to resources. “The economic sustainability is where most businesses feel they are profitable. But profit cannot trump the other two pillars, social and environment, which can conduct in parallel with business management. Activities that fit under the economic pillar include compliance, proper governance and risk management”[16]. What this shows is that the economic pillar is where businesses operate and within it exists the profit motive. Be as it may, the economic pillar does not outmanoeuvre the social and environmental sustainability pillars. The economic pillar is mostly about compliance, risk management and proper governance of the economy.

4.1.3.3. Society

The third pillar in Figure 1 is the society. The social sustainability pillar is about equal opportunities, education, community and standard of living. It can also be said that social sustainability is about “identifying and managing business impacts on people. The quality of a company’s relationships and engagement with its stakeholders is critical. Directly or indirectly, companies affect what happens to employees, workers in the value chain, customers and local communities, and it is important to manage impacts proactively”.[17] This means that the social sustainability pillar is about the impacts that the economy and the environment have on people. Thus, the social pillar may further be described as “development towards improving the quality of life – for example, equality, freedom, health, security, and education; while staying within the limits of environmental carrying capacity” (Bartelmus 1994). Jonathan Harris corroborate this view when he says that “a socially sustainable system must achieve distributional equity, adequate provision of social services including health and education, gender equity, and political accountability and participation” (2000: 6). The social pillar of sustainable development is about the

[16] For more information see: https://www.redalpi.com/web/sustainability/.

[17] For more information see: https://www.unglobalcompact.org/what-is-gc/our-work/social

improvement of people's lives via fair access, delivery of basic services and equitable development.

The social pillar is people-centred and it "maintain[s] the stability of social and cultural systems, including the reduction of destructive conflicts" (Munasinghe and Mc Neeley 1994). This pillar encompasses the ethical elements of social justice and socio-economic fairness. Social justice in this case fights the inequality between the rich and poor when it comes to the standard of living. According to Warner Keith Douglas, the "lifestyles of the wealthiest and the poorest pose the greatest threat to the integrity of the earth's life support systems. The wealthiest consume vastly more than their fair share of resources (more than the planet can provide for everyone), while the poorest have no alternative but to use resources in a short-sighted way" (2009: 6). What this means is that social distribution of natural resources differs as rich individuals get more access to resources compared to poor individuals as they do not have the wealth to acquire even basic services. This pillar of sustainable development poses a challenge to the rich to also consider the poor and marginalised and stand in solidarity with them. The social pillar decreases the gap between the poor and rich through investments in education, health and food (to lessen food insecurity). This, therefore, provides a better chance of life and opportunities for the poor whilst guaranteeing them protection from exploitative practices.

4.1.3.4. The Intersection of the Pillars

Figure 1 above also shows the relationships between the different pillars, for example, the intersection between the environment and economic pillars. The intersection between these two pillars creates environmental-economic (enviro-economic) relations. These relations include energy efficiency and subsidies or incentives for the use of natural resources. Similarly, the intersection of the economy and society (eco-society) pillars creates economic-social relations like business ethics, fair trade and workers' rights. Lastly, the intersection between the society and environment pillars creates socio-environmental relations, and through this, we get to have environmental justice and environmental stewardship. The intersection of all three pillars represents sustainable development (referred to as sustainability in Figure 1). Sustainable development is, therefore, where all

three pillars interact equally. The equal interaction that exists between these three pillars protects the environment and encourages a healthy lifestyle and society whilst striving for a stable economy. Sustainable development involves a change of behaviour from people and it limits environment exploitation in order to preserve the environment for future generations.

The Brundtland Commission pointed out that one cannot look at economic development issues without considering the environmental and social issues (WCED 1987: 30). In a similar vein, sustainable development is "a common currency that unifies environmental, social and economic values and links today's choices to tomorrow's consequences" (Projet de Societe 1995). This means that it involves the integration of economic prosperity, environmental protection and social fairness. Consequently, the three pillars are interdependent and equally support sustainable development. Sustainable development does not only focus on the green economy, but it includes the growth of both natural resources and humans. With that said, the environment is not an independent pillar – it depends on the society and the economy for protection and preservation. Given the above, the aim of sustainable development is, therefore, to avoid or mitigate social imbalances and environmental destruction whilst guaranteeing economic growth.

4.1.4. The Meaning of Sustainable Development in the South African Context

According to the Department of Environmental Affairs (DEA), "in response to the sustainable development agenda, South Africa has adopted the National Framework for Sustainable Development (NFSD)" (2008). The purpose of sustainable development in South Africa:

> is to express the national vision for sustainable development and indicate strategic interventions to re-orientate South Africa's development path in a more sustainable manner. The growing stress on environmental systems and natural resources from economic growth and development strategies were

> explicitly acknowledged. The NFSD commits South Africa to a long-term programme of resource and impact decoupling[18]

The aim of a sustainable development theory is similar everywhere in the world and that is to sustain the environment whilst taking into consideration the society and the economy. The NFSD in South Africa was put in place to follow the agenda of sustainable development, that is, to preserve the environment for future generations. The NFSD acknowledges the growing emphasis on preservation of the natural environment, human development and economic growth. It also considers the integration of the environment, economy and society. The difference is that South Africa's sustainable development is presented in a nested paradigm. According to the DEA, "South Africa aspires to be a sustainable, economically prosperous and self-reliant nation that safeguards its democracy by meeting the fundamental human needs of its people, by managing its limited ecological resources responsibly for current and future generations, and by advancing efficient and effective integrated planning and governance through national, regional and global collaboration" (2018). Figure 2 below shows how South Africa's sustainable development is implemented.

[18] For more information see:
https://www.environment.gov.za/sites/default/files/reports/environmentoutlook_chapter2.pdf

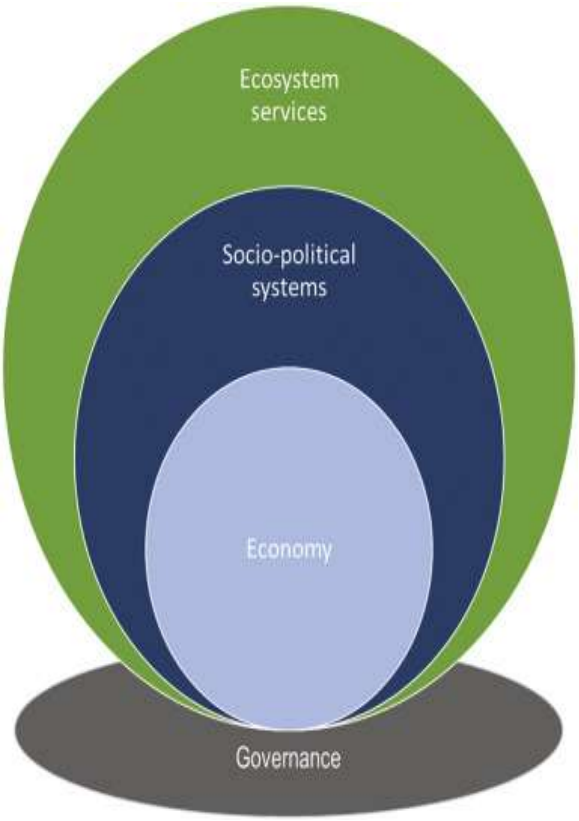

Figure 2: Nested Egg Approach.[19]

Figure 2 portrays the sustainable development theory in the South African context. It signifies the correlation between the environmental systems, the socio-political systems, the economic systems and governance, with the latter being the base (of the egg). Each component in the diagram is equally distributed. As can be seen in Figure 2, the economy pillar, socio-political systems and ecosystem services are integrated one above the other. Governance, as the base, holds all the systems (pillars) in a genuine regulatory framework. According to the DEA, "sustainability implies the continuous and mutually compatible integration of these systems over time. Sustainable development means making sure that these systems remain mutually compatible as the key development challenges are met through specific actions and interventions to eradicate poverty and severe inequalities" (2008). The DEA points out that sustainable development requires that the systems are equally harmonious as the focus is on tackling development challenges. Figure 2 shows

[19] Source: https://images.app.goo.gl/y3i8JkKtBJQK6WJ27.

that the economy, socio-political system and the environment are suitably interconnected to provide for sustainable development.

Governance, as the base of the framework (or egg), provides the foundation and also serves as a guide for stakeholders at every level of governance – from global to provincial to local level. According to Francis Fukuyama, governance can be defined as the "government's ability to make and enforce rules, and to deliver services, regardless of whether that government is democratic or not" (2013: 3). The DEA argues that "the nested model of sustainability also shows the role of a governance system that can provide leadership and systematic and strategic guidance, as well as a sanction when required. This role is necessary to ensure fair allocations of responsibility and obligation when it comes to the environmental and developmental spheres".[20] In terms of Figure 2, the DEA underscores that governance, as the base, provides guidance and serves as the leader when necessary and when some development has to be done.

All in all, Figure 2 illustrates the sustainable development theory and how the different components or systems relate to one another. In South Africa sustainable development is further described as:

> A developmental process which is grounded in three developmental elements namely economic, social and environmental elements. Their interdependence forms a holistic approach to development, and subsequently they are viewed as the three pillars forming the basis of sustainable development. The governance framework of South Africa sustains this structure (Moosa 2002: 8).

What the above means, and as previously noted, is that the framework is made up of three pillars which include the society, the environment and the economy. The society pillar looks at the livelihoods of people within society. The environment looks at the laws and policies relating to the environment, the way the environment is treated and the importance of sustaining it. The economy looks at the economy of the country. I am therefore inclined to think that the three pillars are important for a better development strategy for every

[20] For more information see:
https://www.environment.gov.za/sites/default/files/reports/environmentoutlook_chapter2.pdf

discipline as each pillar needs the other. Against this backdrop, William Mark Adams states that "the three 'pillars' cannot be treated as if equivalent" (Adams 2006: 4). He argues that these pillars are different, and they cannot be treated as equal components. In response to Adam, I do believe that as much as the pillars appear to be different, they are interrelated and need to be combined in order to develop effective strategies or solutions to sustainable development.

4.1.5. Critique of the Sustainable Development Theory

This section discusses the arguments in support and against the sustainable development theory. I will begin with the arguments in support of the framework followed by those arguments against it.

4.1.5.1. Arguments in Support of the Sustainable Development Theory

Sustainable development has many strengths, but I will restrict myself to a few arguments in support of sustainable development. The three pillars that comprise sustainable development are strengths as they make sustainable development powerful. Jonathan Harris corroborates this when he says that "they satisfy the criterion set forth earlier by the Brundtland Commission for a powerful, easily grasped concept which can have wide applicability. If we could move closer to achieving this tripartite goal, the world would be a better place" (2000: 6). The three pillars are important for genuine sustainable development. Jonathon Porritt argues that "sustainable development is the only intellectually coherent, sufficiently inclusive and potentially mind-changing concept that gets even half-way close to capturing the true nature and urgency of the challenge that now confronts the world. There really is no alternative" (2001: 4). This means that sustainable development is able to change human behaviour for future generations to also benefit from the natural resources that we have.

Sustainable development is an important tool that can combine different sectors to devise a powerful solution. According to the IIED:

> Some decisions advance all the goals identified by sustainable development simultaneously: they improve material well-being for this generation, spread

> that well-being more equitably, enhance the environment, strengthen our ability to manage problems, and pass on enhanced stocks of capital to future generations. Other decisions will result in both gains and losses. If the gains are great enough and the losers can be compensated, the decision should be to proceed. This is the zone of trade-offs and requires an agreed mechanism for reaching a decision. 'No-go' decisions – A final group of decisions may go past some widely accepted limit, such as destroying critical natural capital or transgressing fundamental human rights. If these conditions hold, the decision should be to not proceed (2002: 22).

What the above simply means is that solutions that sustainable development put forward empower the improvement and the well-being of the present generation, as well as take into consideration future generations. In other words, the benefits that the present generation gets from sustainable development apply to future generations. If the solutions affect the present generation negatively then, consequently, the future generations will also be negatively affected. The above quotation by the IIED highlights that solutions or decisions can be placed in three categories: The first is the "win-win" solution, the second is the "trade-off" solution, and the third part is the "no-go" solution. The "win-win" solution means that both generations win. The "trade-off" solution means that there must be an agreement between the three pillars first before arriving at a solution. Finally, the "no-go" solution means that the solutions may cause some damage not only to the environment but to the economy and society. Therefore, this kind of solution is a "no-go", meaning that there is no need to proceed with the decision-making. The above helps ensure that correct or good decisions relating to sustainable development are made.

Sustainable development is widely known and used by various scholars. It has also been implemented by many countries in the world including, amongst many others, France, Sweden and Finland. Drexhage and Murphy are of the view that "The nearly universal adoption of sustainable development as a guiding principle is in part due to its flexibility because it allows various stakeholders to adapt the concept to their own purposes" (2010: 9). This means that sustainable development is adopted by different patrons and they use it in a way that suits them. For example, South Africa adopted sustainable development in its NFS and follows its agenda. Furthermore, the International Council for Local Environmental Initiatives (ICLEI) points out that "Over 6400 local governments in 113 countries were involved in local Agenda 21 activities in 2001" (ICLEI 2002: 4). Also, in

line with the aforementioned, the United Nations General Assembly refers to "the widespread acceptance of sustainable development as evidenced by the adoption of sustainable development strategies by 106 national governments in 2009" (2010: 11).

According to the Brundtland Report, "our global future depends upon sustainable development; it depends upon our willingness and ability to dedicate our intelligence, ingenuity and adaptability and our energy to our common future. There is a choice we can make" (1987). This means that our future depends on our moral behaviour. Thus, everything that happens on this planet is based on the moral decisions that we make. Each and every individual, therefore, are required to take into consideration the fact that they are moral agents and that their decisions are important in terms of having a common future.

4.1.5.2. Arguments Against the Sustainable Development Theory

As much as sustainable development is regarded as the best tool to use for development in any form, it has its weaknesses. According to Mohammad Reza Salamat, "out of the three dimensions of sustainable development economic growth, social development and environmental protection the main challenge, in my view, originates from adequately and effectively attempting to secure the environmental and social dimensions, so as to ensure the 'integration' of the latter with economic growth" (2016: 3). Salamat thus stresses the importance of economic growth and the challenge of integrating it with the environmental and social pillars or dimensions. His reason for emphasising the economy "is because economic growth remains the primary objective of all governments and policy-makers, by virtue of their mandated responsibilities" (Salamat 2016: 3). Salamat is of the view that given the concept of sustainable development and the integration of the three pillars, economic growth is the main aim for all governments and policymakers.

In addition to Salamat, Oscar Nudler argues that "economic growth requires expansive industrialization, which in turn accounts for the rapid depletion of resources, pollution of air and water, emission of hazardous gases, and use of toxic chemicals which eventually lead to environmental disorders such as resource scarcity, global warming, ozone depletion" (1986). This means that the economic benefit can have a negative impact on the environment. In this case, not only will the environment be affected but society as well.

Furthermore, “economic growth has been the framework used by developed countries in attaining their unprecedented levels of wealth, and it should be no surprise that major developing economies are following the same course” (Drexhage and Murphy 2010: 6). This means that economic growth is more important to developing countries as sustainable development appears to be seen in a more theoretical as opposed to practical light. The main concern of developing countries is economic growth. This links back to Salamat’s argument stressing the importance of economic growth. The main concern is that developing countries develop or grow their economies and disregard the other pillars. This will lead to sustainable development being mere theoretical as opposed to being practical.

Sustainable development seeks to cater to the present and also for the needs of future generations. According to Ingmar Lippert, “sustainable development should not be defined based on the idea of ‘needs’ or ‘options’ but discuss in how far it is acceptable in a certain historically, socially, and culturally shaped context to cut options for future generations normatively” (2014: 27). What this means is that sustainable development should not look at the needs or options for future generations, but rather focus on how it will in a historically, socially and culturally shaped context affect the options for future generations. Not everyone thinks that future generations even have options. This is probably because it is said that future generations “lie outside of our moral community because they cannot act reciprocally” (Golding 1972). In the same vein, Jeffrey Gaba underscores that “no future humans are now present to assert whatever moral claims they might have” (1999: 263). This means that future generations have no moral rights that they can claim as “since they do not exist, they cannot formulate them” (Lippert 2014: 27).

4.2. The Ethical Theory of Environmental Stewardship

Environmental stewardship is another theory that reinforces this study, particularly from an ethical perspective. The idea of environmental stewardship was acknowledged by the public in the 1960s. This is evident in the works of scholars like Rachel Carson (*Silent Spring* 1962), Aldo Leopard (*A Sand Country Almanac* 1966) and Garret Hardin (*The Tragedy of the Commons* 1968). The importance of this theory in environmental ethics is

that it provides precise, rational, and moral respect and care to natural resources or, rather, the natural world.

4.2.1. What is Stewardship?

According to Robin Attfield, stewardship "involves being a trustee or guardian of goods such as time, money or other resources, and has in recent times been applied to the human responsibility for the care and management of the natural world" (2015: 1). In other words, stewardship is about being a caretaker and accepting responsibility. Stewardship is concerned "with the management of human behavior as it relates to the natural world" (Welchman 2012). When looking at stewardship from an environmental perspective it is about "taking responsibility for the environment to protect it from harm, to maintain it to be habitable, to keep its treasures and to preserve it for future generations" (Chirisa 2010: 44). This simply means that stewardship is about taking care, and protecting and preserving the environment for future generations so that they can also have moral rights to a healthy environment.

Stewardship can also be seen from a religious standpoint. According to Attfield, "the association of stewardship with longstanding theistic traditions, whether Jewish, Christian or Islamic, has aroused objections that it is for these reasons an expression of a pre-modern hierarchical, oppressive and/or sexist society" (2015: 7). John Passmore emphasized that stewardship "is everywhere the responsibility of the animate to look after the inanimate and subsequently to the neo-Platonist Iamblichus, who derived from this passage the view that humanity is sent to earth by God 'to administer earthly things' and care for them in God's name" (1974: 28). In a similar vein, Clarence Glacken asserted that the Bible fully supports human stewardship concerning the natural environment (1967: 168). Stewardship requests that we "relook at our attitude towards wealth, economic growth and how we distribute and consume the goods of this earth" (ICBC 2003: 15).

4.2.2. Environmental Stewardship: Defining the Theory

Environmental stewardship can be described as "the responsible use (including conservation) of natural resources in a way that takes full and balanced account of the

interests of society, future generations, and other species, as well as of private needs, and accepts significant answerability to society" (Worrell and Appleby 2000: 263). Similarly, it is described as "responsibly managing activities with due respect for the health of that environment by being the environment's caretaker or custodian" (Department of Environment and Heritage 2005). This simply means that environmental stewardship is about being ethically responsible for the environment. Furthermore, environmental stewardship may be understood as "an ethical responsibility when short-run profit-seeking behavior dictates practices contrary to long-term maintenance of [environmental] quality [of natural resources]" (Sauer *et al*. 2011: 32). It is about taking ethical responsibility when there are decisions to be made, be it short-term or long-term, that may affect the environment.

Environmental stewardship can further be described as "one of the key underpinnings of ecologically sustainable resource use" (Sperling 1997). The theory encourages a change of behavior in terms of the environment and it invites us to take moral responsibility for the environment. The "theory of planned behavior provides a general framework for the relationship between attitudes, beliefs, intentions, and behavior" (Azjen 2001). The theory has a relationship with our attitudes, beliefs, intentions and behavior. In viewing the theory from the African perspective, Samson Gitau explains that "the traditional African concept of nature is a rich one that views humanity as a partner with, other than master over, nature as natural objects and phenomena are regarded as God's revelation" (2000: 4). In Africa, the natural environment is treated with respect as it is seen, as noted above, as God's revelation.

Environmental stewardship "is built on the hypothesis that a person's core values form a foundation of consistent ethical values and goals leading to a set of moral norms and aspirations that influence individual decision making and behavior" (Worrell and Appleby 2000; see also Van Slyke 2007). As humans, we all have a moral duty towards the environment, and this influence our decisions and behaviour. Also, our moral norms, values, beliefs and aspirations as humans are fundamental because they serve as a foundation for our behavior toward the environment in which we live. In light of this, "stewardship theory considers the possibility that, over time, individuals can become

stewards of a particular object or set of objects, and that this can develop based on trust, reciprocity, autonomy, discretion, responsibility, job satisfaction, stability and tenure, reputation enhancement, and alignment of objectives" (Van Putten *et al.* 2014: 4). Each and every individual has the capability of becoming stewards in the sense that we all have those things that we cherish and which we take full responsibility for.

With regard to the environment, there are some types of behaviours which can be regarded as environmental stewardship behaviours. One example of these behaviours is eco-centric attitudes.[21] Eco-centric attitudes "reflect the belief that nature has a value of its own and deserves protection independently of any economic service it may provide, and these conservation-centered attitudes are often predictive of pro-environmental behavior and stewardship in empirical research" (Drake *et al.* 1999; see also Tosakana *et al.* 2010). This kind of behaviour recognises the value of the environment and seeks to protect and respect the environment through conservation and sustainability measures.

4.2.3. Critique of the Ethical Theory of Environmental Stewardship

The subsections below discuss the arguments in support and against the ethical theory of environmental stewardship and in doing so show the strengths and weaknesses of the theory.

4.2.3.1. Arguments in Support of Environmental Stewardship

In light of the various definitions of the theory, it is evident that environmental stewardship guides human behaviour and promotes care for and sustainability of the environment. Jenifer Welchman notes that environmental stewardship is aimed at protecting both present and future generations (2012: 309). Similarly, "stewardship is the responsible use (including conservation) of natural resources in a way that takes full and balanced account of the interest of society, future generations, and other species as well as private needs, and

[21] More of these behaviours can be seen in Robert Jones and Riley Dunlap (1992) work titled the *Social Bases of Environmental Concern: Have they changed over time?*, Also, more about the behaviour can been seen in the works of Riley Dunlap and Kent Van Liere (1978) in an article titled *The "New Environmental Paradigm",* and Ian Reeve (2001) in an article titled *Australian Farmers' attitudes on rural environmen*tal *issues 1991-2000.*

accepts significant answerability to society" (Worrell and Appleby 2000: 269). The theory about preserving the environment, taking care of the environment, and taking moral responsibility towards the environment is not only for the present generation but also for future generations.

According to Attfield, "faced with a loss of species of an almost unprecedented kind, adherents of environmental stewardship will support measures of preservation, and in some cases restoration" (2014: 16). This means that the theory helps with the protection of the environment as it supports the measures and methods of restoring the natural environment. The theory is needed because:

> the ethic of environmental stewardship creates an opportunity to reframe the way in which environmental problems are viewed and addressed. Rather than discussing environmental problems in conservative, conventional and often overly technical terms, we can view them as opportunities for improving efficiency, engaging in problem-solving, and sustaining clean water, clean air and other natural resources (Environment Protection Act 2005: 10).

The theory produces opportunities that aid in ensuring that environmental problems are addressed in a different sustainable way. This, therefore, provided the time and space to come up with good and ethical solutions that can help with environmental problems. The theory does not discuss problems, rather it puts forward solutions that can be implemented to ensure that the environment is preserved not only for the present but also for future generations. Corroborating this view, Munyaradzi Felix Murove elucidates that "our interests should be linked to the interests of others so that we contribute positively towards those who will exist in the future" (2005: 211). The theory encourages individuals to realise their moral obligations and responsibilities towards the protection of the environment.

4.2.3.2. Arguments Against Environmental Stewardship

Clare Palmer states that the "stewardship of the natural world, whether Christian or otherwise… remains profoundly anthropocentric and un-ecological, legitimating and encouraging increased human use of the natural world" (2006: 75). She is of the view that environmental stewardship still encourages superiority over the environment whether as a Christian or otherwise. This superiority is based on the decisions we make on how we want

to treat the environment. Looking at the early traditional stewards, Mary Ann Beavis pointed out that "the image of the steward implies an administrative/managerial model of the church as 'God's House' borrowed from the patriarchal/imperial household, with its hierarchies of master-slave, husband-wife, parent-child, ruler-ruled" (Beavis 1991: 76-77). In a similar vein, Hugh Whelchel states that as much as environmental stewardship allows us to have control over the environment, humankind has misinterpreted its meaning and has, in turn, exploited the environment (2012).

According to Palmer, "the stewardship model represents humanity as God's deputy on earth, for whom, at least in some versions, everything was made; whereas, if we accept Darwinism, humanity is as much a product of evolution as other species are, and the survival of those species involves not human government but their being left alone" (1992). This means that humans are presented as God's deputies, in the sense that we tend to act as managers of the environment. We ethically determine what is the right or wrong action when it comes to the environment. In this case, we are at a more advantaged position when it comes to the environment. Attfield argues that "a range of critics have alleged that stewardship involves human interference with the entire surface of the planet in order to enhance the productivity of nature's resources" (2014: 10). Because humans oversee the productivity of natural resources and the environment, they tend to see themselves as "second-in-command" to God. All in all, Jenifer Welchman emphasises that stewardship is anthropocentric by nature. This is due to the fact that it promotes human values instead of "nature independent of its role in human life" (2012: 307).

4.3. The Link between Sustainable Development and Environmental Stewardship

Sustainable development and the ethical theory of environmental stewardship have a connection which is based on the idea that "environmental stewardship is about keeping

what we have while sustainable development is about getting what we need".[22] Both are about sustaining and protecting the environment and also considering future generations in current decision-making. Sustainable development and environmental stewardship address the individual and cooperative moral behavior in that they challenge our responsibilities and also our obligations towards the environment. With that in mind, I am inclined to think that these theories work best together, and with the combination of the theories, one can make decisions concerning the protection of the natural environment without disregarding the economy and society.

The theories are mainly about the protection of the environment to meet the needs of the present generation without compromising the rights of future generations. According to the Port of Virginia "the future of sustainable success requires responsible stewardship of our environment".[23] The two theories assist in environmental planning, managing and control of environmental protection strategies. The connection between the two theories is crucial in that for sustainable development to be successful one has to be a moral steward (or environmental steward). With that in mind "environmental objectives may be a primary motivator for engaging in stewardship" (Bennett *et al* 2018: 605). This means that the objective that we have of lowering carbon emissions may help be the motivator in changing anthropocentric behaviours and moving towards being stewards of the environment.

4.4. Conclusion

This chapter presented the theoretical framework of the dissertation. Specifically, it focused on sustainable development and environmental stewardship. In the first part of the chapter, I began with a discussion of the ethical theory of sustainable development and in doing so the two terms sustainability and development were explained. The theory was broken down into pillars, namely, the environment, society, and economy. These pillars and the intersection between the pillars were explained. Sustainable development in the

[22] For more information see: https://engineerscanada.ca/publications/national-guideline-on-sustainable-development-and-environmental-stewardship#-relationship-between-sustainable-development-and-environmental-stewardship.

[23] For more information: https://www.youtube.com/watch?v=N7OGLWjKU9U&t=31s

context of South Africa was then discussed and this was followed by the arguments for and against sustainable development. In the second part of this chapter, I discussed the ethical theory of environmental stewardship. Here, I explained what environmental stewardship is, the and the arguments for and against the theory. In the final part of this chapter, I discussed the connection between sustainable development and environmental stewardship.

The next chapter will be the analysis. Here, sustainable development and environmental stewardship will be used as the guideline for the ethical interrogation of a carbon tax as a means to reduce GHGs.

Chapter Five

Analysis

5.0. Introduction

The previous chapter focused on the two ethical theories underpinning the study, namely, sustainable development and environmental stewardship. The chapter gave a detailed explanation of sustainable development and environmental stewardship and an understanding of the former in the South African context was also provided. The current chapter will analyse, from an ethical perspective, the payment of a carbon tax as a means to reduce GHG emissions in South Africa. The findings of the research will be analysed through the lens of sustainable development and environmental stewardship. The chapter is divided into two sections: In the first section, I will examine carbon tax through the lens of the sustainable development pillars which were discussed in the previous chapter. I will argue that a carbon tax policy alone cannot repay the damage done to the environment. I will also briefly argue that a carbon tax policy cannot, on its own, curb environmental pollution by stopping people from polluting the environment. In the second section, I will look at carbon tax and the ethical theory of environmental stewardship. The chapter ends with a conclusion.

5.1. Carbon Tax and Sustainable Development

This section places carbon tax within the sustainable development framework. This will be presented under the three pillars which were explained in Chapter Four. It is worth noting that there are both challenges and benefits of a carbon tax to the environment, society and the economy and in this section, I will examine how a carbon tax is a contributing factor to the sustainability of these pillars. I will also examine how the three pillars can strengthen the carbon tax mechanism in terms of the sustainability of the environment. It is acknowledged that the three pillars co-exist with one another.

5.1.1. Carbon Tax and the First Pillar: Economy

Here I examine how sustainability and economic growth can be achieved. Firstly, the idea of a green economy in South Africa comes to the fore. The former president of South Africa, Jacob Zuma, stated in a speech that "ecosystem failure will seriously compromise our ability to address our social and economic priorities… there is significant opportunity for the development of a green economy in Southern Africa, which extends to other parts of the continent" (2010). The idea of a green economy is not new. It can be defined as a "system of economic activities related to the production, distribution and consumption of goods and services that result in improved human well-being over the long term, while not exposing future generations to significant environmental risks or ecological scarcities" (Department of Environment, Forestry and Fisheries 2019). The idea of a green economy has been in existence for some time and has been (and still is) discussed in the context of sustainable development.

The implementation of a carbon tax policy is a way of moving towards a green economy. Hinting at the president's statement, Carla Clamp states that "without a clear direction to the president's green ambitions things may as well go up in smoke" (2020). The statement is true if there is no clear direction when it comes to the implementation of a carbon tax. In addition, there needs to be an understanding of who will, amongst other responsibilities, ensure that the policy is regulated. As much as the implementation of the carbon tax policy in South Africa is a move towards a green economy and a way of meeting the Paris Agreement, the policy should not only be about boosting the economy and proper protocols must be taken. My reason for this contention is that the policy does not specify who will ensure that companies actually lower carbon emissions.

5.1.1.1. Contribution of a Carbon Tax to Economic Growth

As mentioned in Chapter Three, "the primary objective of the carbon tax is to reduce greenhouse gas (GHG) emissions in a sustainable, cost-effective and affordable manner" (National Treasury 2019: 1). The policy's main aim is to reduce the GHG emissions that emitters release into the environment. South Africa has implemented the policy in a cost-effective and affordable manner for the emitters. Mariam Isa states that "critics have argued

that the country cannot afford a tax on carbon emissions at a time when the economy is stuttering, unemployment is at a 15-year peak and business is already burdened by electricity prices that have nearly tripled in real terms in the past decade"(2019).[24] As much as the carbon tax policy is said to be cost-effective and affordable, I think that it might negatively affect the economy to some extent but also, when applied properly, positively contribute to the economy.

Based on the discussion thus far and given that the carbon tax policy is a new law in South Africa, I would like to think that it will help the economy if implemented properly. The carbon tax policy can contribute to the sustainability of the economy and this can be achieved through proper planning and proper utilisation of the taxes collected to strengthen the economy. My reason for this view is that the policy will fail or negatively affect the economy if there is no proper planning as to what the tax will be used for. Like the "usual" tax people pay that is being channelled into education and payment of grants, the carbon tax can be invested or channelled into building the economy or used in some other way that will benefit the people of South Africa. Thus, I am inclined to think that the carbon tax policy will negatively affect the economy if, and only if, there is no proper planning or strategy on how to properly utilise the tax paid to enhance the economy. Should such planning be in place, I believe that the carbon tax will contribute a great deal to the economy of the country.

5.1.2. Carbon Tax and the Second Pillar: Environment

Chapter 2, Section 24 (a and b), of the Bill of Rights, refers to the environment. Several environmental laws were created in 1996 (Constitution of the Republic of South Africa 1996: 11). In 1998, the National Environmental Management Act (NEMA) no. 107 was created. The NEMA was developed for "co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for coordinating

[24] For more information see: https://www.news24.com/fin24/finweek/business-and-economy/will-sas-carbon-tax-lighten-the-load-20190530.

environmental functions exercised by organs of state; and to provide for matters connected therewith" (Government Gazette 1998: 2). The NEMA serves as a guideline for other laws and acts that have followed, and it is there to encourage environmental sustainability.

According to the NEMA, "the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment" (Government Gazette 1998: 14). Regarding a carbon tax, the damage that is done to the environment by the carbon emitters will be paid as a tax. A possible negative consequence of this is the fact that consumers may experience hardships due to an increase in the price of the carbon-induced goods. However, we cannot disregard the damage that carbon emissions have done to the environment and this is why sustainable development is important. Brennan Cotter emphasises that "there are some groups around the world that have shown the beginning steps and give us interesting models, but it will be up to all individual and nations to move towards sustainability…" (2019: 23). Other countries that have implemented a carbon tax such as Canada, Singapore and many others have been successful in doing so. As Ukanga *et al.* point out:

> We, the peoples of the Earth, must find ways to work together to raise the level of our collective consciousness to sustain the dignity of being human. Sustainable development is not about maintaining a good quality of life for just one generation, but rather about passing the ability to realize a good quality of life from generation to generation. Our quality of life is a construct of our existence (2010: xii).

The bottom line is that we all have a moral responsibility and obligation to sustain the environment. Clamp, referring to South Africa, states that "As the 14th largest C02 emitter in the world, with our mainstay industries like electricity, transport and mining producing 80% of our total emissions, climate change is not something we can ignore" (2020). To sustain our environment, we have to lower emission rates either individually or as a company. We have to acknowledge that a lot of damage has been done to the environment because of the release of GHGs and it is, therefore, important that we maintain the environment and take carbon tax seriously. Taking good care of the environment will help in the reduction of a carbon tax and will also help to enhance the quality of life in that the

environment will be a healthy one. A carbon tax is implemented to sustain the environment. However, it is important to question whether such a tax will really sustain the environment, or whether it will only benefit the economy. As much as the emitters will account for the damage, they do to the environment through paying a carbon tax, there is no guarantee of behavioural change as previously stated. One also needs to bear in mind there is no way one can pay back non-renewable resources.

Based on the discussion thus far, it is evident that a carbon tax policy aims at helping to achieve a green and pollution-free environment and that such a policy can contribute to the sustainability of the environment.

5.1.2.1. The Carbon Tax Payment Alone Cannot Repay the Damage Done to the Environment

Environmental pollution and climate change are both existential threats to humanity and different measures have been put in place to curb the threats they pose to the environment. One of the measures, as discussed previously, is the implementation of a carbon tax policy. Here, emitters are expected to pay a particulate amount as a fine based on the amount of carbon they emit into the environment. As stated in Chapter Three, the first phase of the carbon tax is "R120 per ton of carbon dioxide equivalent emissions. This rate will increase annually by inflation plus 2 per cent until 2022, and annually by inflation thereafter".[25] Since we are in the first phase the carbon tax is charged at R120 per ton and there are allowances awarded to the emitters that follow the rules properly. These allowances are there to lower the tax rate to enable emitters to pay the tax. However, this only applies to the first phase because in the second phase rules will be stricter. Mark Hewitt emphasises that "these allowances are, however, limited to a maximum of 95% discount on the rate of tax (currently R120 per ton of C02 equivalent). The effective rate of Carbon Tax is therefore expected to range between R6 and R48 per ton of Carbon Dioxide equivalent of

[25] For more information see: https://www.sars.gov.za/ClientSegments/Customs-Excise/Excise/Environmental-Levy-Products/Pages/Carbon-Tax.aspx.

the GHG emissions during Phase 1" (2019). This is the price that the emitters are expected to pay.

According to Donald Brown, "an ethical approach to climate change requires those who are responsible for human-induced climate change harms to comply with their duty to not harm others without regard to the economic value of costs and benefits of climate change policy responses" (2018). It is worth noting that the price set to be paid by the emitters should not be the main reason why emitters should use cleaner technology because they will still have to pay for it too. The emitters should thus not only focus on economic values and gains but should rather be aware of their moral responsibilities and duties towards the environment. As Brown further states, "proponents of carbon pricing schemes claim that pricing regimes allow those responsible for reducing GHG emissions to achieve reductions at the lowest cost, yet the amount of reductions that a nation is obligated to achieve is essentially an ethical matter" (2018). According to Jeffrey Ball, "policymakers have lacked the spine to impose a high enough price. The result is that a policy prescription widely billed as a panacea is acting as a narcotic. It's giving politicians and the public the warm feeling that they're fighting climate change even as the problem continues to grow" (2018).

Thus, in view of the above, I am inclined to think that there is no right or perfect amount set that can repay (or compensate for) the damage that human-induced actions have caused. There is a possibility that the policymakers who established the carbon tax policy did so with the impression that it would right the wrong by repaying for the damage that humans have caused to the environment. If this is the possible reason for the policy then I think the policymakers are wrong in that no matter the amount of money paid it cannot repay the damage that has already been done to the environment. In other words, no "good enough" price can be set to pay for the damage that has already been done. The damage has been done and no amount of money can undo what has been done. Money cannot rectify everything. For example, the damage that has been done to the ozone layer due to the emission of carbon into the environment cannot be repaid or "fixed" with money. In a similar vein, the melting of glaciers cannot be fixed or repaired with money. However, given that it is our moral responsibility to take care of the environment the payment of a

carbon tax is of paramount importance because it will go a long way, if handled properly, in preventing further damage to the environment. It is our duty to protect and be stewards of the environment for both the present and future generations.

5.1.2.2. The Carbon Tax Policy Alone Cannot Curb Environmental Pollution and Climate Change

Given my argument above that a carbon tax alone cannot repay (or compensate for) the damage done to the environment, my aim in this section is to briefly argue that a carbon tax policy alone cannot curb environmental pollution and it also cannot stop people from polluting.

A carbon tax, in the main, is put in place to "achieve environmental goals at least cost" (IMF 1998). In light of this, policymakers have tried to make the tax affordable to people with the aim of curbing environmental pollution. The policymakers viewed the policy as the most efficient way to cut GHG emissions – "the single most effective mitigation instrument" (IMF 1998). The carbon tax policy in South Africa is meant to lower GHG emissions at a low cost and one that the emitters will supposedly be able to afford. The OECD corroborated this when they underscored that a carbon tax policy will help to lower the negative impacts of carbon emissions. From the above we can deduce that the aim of a carbon tax policy is, in general, to curb environmental pollution

A carbon tax policy does not assure that the behaviour of the emitters will change and that the level of carbon emissions will decrease. Because of this, it could be argued that irrespective of the amount of tax levied against the emitters, their actions would not necessarily change. For the policy to work it is up to the emitters to decide whether they want the change or not. Even if the tax is set at an affordable price this does not mean that people will comply; if people do not comply it nullifies the policy because it cannot work on its own – the policy needs the support people.

Thus, based on the discussion above and the submission in the previous section that a carbon tax cannot repay the damage done to the environment. My reason for this is that a

carbon tax policy does not necessarily "ensure a certain level of emissions reductions" (Summer *et al*. 2009: 1). A carbon tax policy is presented as a working solution but its viability is not assured given that emitters are rational beings capable of making decisions that will favour themselves at the expense of anything, including, for example, the environment. The emitters can decide to pay the tax and continue polluting because they can afford it. Thus, people will keep polluting the environment because it is up to them to decide whether to comply with the policy or not.

5.1.3. Carbon Tax and the Third Pillar: Society

The third (and final) pillar is the society and a carbon tax's contribution to its sustainability is discussed below.

5.1.3.1. Carbon Tax as a Deterrent to Environmental Pollution

According to Godfrey Tangwa, "as human beings, we carry the whole weight of moral responsibility and obligations for the world on our shoulders" (2004: 388). What this means is that it is our moral duty and obligation as members of society to sustain and preserve the environment not only for us now but also for future generations. Given that South Africa is a developing country, the issues of health, education and poverty must be taken into consideration when it comes to development in society.

Based on the discussion thus far it is evident that the carbon tax policy is a new law in South Africa which aims to help society in achieving a green and pollution-free environment. A carbon tax policy can contribute to the sustainability of society and this can be achieved through environmental education. My reason for suggesting this is that with the introduction of a carbon tax policy, policymakers will be required to educate people about the policy given that they cannot introduce something without explaining how it works and its importance. Hence, there is a need to educate people about the policy, environmental issues and their duty towards the environment. Once this is done, there is the possibility that a majority of people in society will play their part in ensuring that they do what they can to achieve a green and pollution-free environment.

Referring to environmental education, Harvey Hurry stresses that "environmental education enforces the awareness of and encourages sensitivity to the economic, social and political environment as well as to the ecological interdependence in urban and rural areas" (1980: 150). Having environmental education helps with acquiring solutions and strategies which can be indigenous to their communities. With environmental education, community members can use their knowledge of the environment to devise solutions to the problems they face in their communities. For example, if they face the issue of air pollution, they can devise ways to lower carbon emissions to achieve a better quality of air. With environmental education, people are more likely to have ideas on how they can work on their own to lower GHGs and strengthen compliance with a carbon tax policy

However, due to the lack of environmental education in South Africa "environmental concerns remain fairly remote and distant" (Conradie 2003: 130) for many South Africans. In terms of the carbon tax, many South Africans do not know what a carbon tax is and why it was implemented in the first place. Thus, when the prices of carbon-based goods like electricity or petrol go up, many people will possibly not understand the reason/s for the increases. The issue of carbon emissions is a serious one in South Africa since we burn fossil fuels to produce electricity. Furthermore, some communities in South Africa still chop down trees to get wood, which is used to make a fire for various purposes. Thus, in the absence of environmental education, domestic carbon emissions will be disregarded in situations such as these.

The implementation of a carbon tax in South Africa was a smart move but it is not going to be as effective as it could be if people are not informed about it or have no (educational) knowledge of it and thus do not see the need for it. The issues of environmental pollution and climate change are not sufficiently emphasised in South Africa. Ernst Conradie explains that "some regard environmental problems as less serious and are confident that technological solutions will in due time become available to resolve existing environmental concerns" (2003: 130). Environmental problems are not given as much attention as they should be as technology is now considered more important than the natural environment. While some people are aware of the effects of environmental pollution they would rather

focus on technology as it is the future. In doing so they disregard the importance of sustaining the environment for the future. Given that technology is the future, it can be used to our advantage by advertising the importance of lowering GHGs. Technology can also be used to lower GHGs when constructed for the service of the environment. Thus, the above are the reasons why environmental education is important.

5.1.4. Issues Relating to a Carbon Tax Payment

In this section, I briefly discuss the issues relating to the payment of a carbon tax as a means of reducing GHG emissions and moving towards a sustainable environment in South Africa. I will restrict myself to three issues which I consider both important and intriguing.

The implementation of a carbon tax is an ethical move towards the sustainability of the environment. It is also a good move towards reducing carbon emissions which will result in lessening climate change and environmental pollution. Furthermore, a carbon tax does not only help humans but also helps and saves animals from extinction. Given that a carbon tax aims to reduce the amount of carbon emissions and to make people responsible for their actions, animals will benefit because the amount of carbon released will be less than before. Thus, we are indirectly helping and saving animals from extinction.

Just like humans, animals also have moral standing with regard to environmental sustainability. Many philosophers have argued for the moral standing of animals. For example, Tom Regan argues that "moral standing should be acknowledged in all 'subjects-of-a-life': that is, those beings with beliefs, desires, perception, memory, emotions, a sense of future and the ability to initiate action" (1983). This means that every component of earth, including animals, must be considered and that there should be the idea of equality between human and animals as there are no species that are superior to the other. Peter Singer argued that "the criterion for moral standing is sentience: the capacity to feel pleasure and pain" (1973). Just as humans feel the negative impact of air pollution, so do animals.

As much as the above sounds good, there are issues regarding the payments of a carbon tax. The first issue is that the payment of a carbon tax alone cannot sustain the environment. Although the payment of a carbon tax seems a smart and ethical move, the payment alone will not help in ensuring environmental sustainability. As Fakoya points out, "South Africa is a developing country with many socio-economic problems ranging from poor economic growth, poverty, unemployment and corruption amongst others. The introduction of a carbon tax is most likely to worsen some of these problems" (2015: 5). Given what Fakoya has to say, there might well be tax-paying defaulters. However, some will not mind paying the tax because they can afford to do so while others might have someone "scrap" the payment for them. Thus, I am of the view that the payment of a carbon tax alone will not help in sustaining the environment. I am not of the view that it will not in any way help; rather, for environmental sustainability, a tax payment needs to be combined with good work and environmental stewardship which come with the idea of individual and communal responsibility and decision-making. It is only when the latter is considered that the payment of a carbon tax can be effective but it cannot work on its own. This leads to the second issue which has to do with the idea of fear in people.

The second issue is the idea that a carbon tax payment will instil fear in people. Because of the many socio-economic problems evident in South Africa, the implementation of a carbon tax payment could result in fear or an increase in fear among people, especially those who will not be able to afford the payment. Complaints from people that cannot afford the payment and are dependent on the systematic emission of carbon (through no fault of their own) in order to survive will ensue. Although the payment of a carbon tax will serve as a deterrent to emitting carbons (which is the third issue), it will come with problems of its own – many people do not know about the payment and many people who struggle to make ends meet (and who are carbon emitters) will not be able to afford it. Fear will thus be instilled in people.

The third issue regarding the payment of a carbon tax, although not far removed from the above, concerns it serving as a deterrent to those polluting the environment. From one perspective, we could argue that it will deter people from polluting the environment.

However, at the same time, some people will use it to exploit others. For example, some business might increase the price of goods, thereby indirectly funding their carbon tax payment from the higher profits they make. Customers, who will be unaware of this, will thus be used as a means for businesses to make their carbon tax payments. Creedy and Sleeman point out that "the prices of the more carbon-intensive goods increase proportionately more than those with lower intensities" (2006: 333-334). This means that the goods that produce more CO2 will be more expensive than those that produce lower intensities of the gas. For example, electricity and petrol will be more expensive than other goods and services that are carbon-free. In light of this, Tim Callan *et al*. emphasise that "since government's carbon tax policy will necessarily increase the price of energy and because energy is a necessary good in production and household consumption, a carbon tax can be considered as regressive because it can cause disproportional harm to low-income earners and poorer households" (2009: 407-409).

Based on the aforementioned, I am inclined to think a carbon tax payment might not deter businesses from polluting the environment given that they can afford the payment by charging their customers more. So, while the carbon tax may deter people, it will not deter everyone, because some people can easily transform it in a way that will benefit them. If that happens, I am apt to think that what matters to these people is the payment, and this should not be the case. As I have discussed before, a carbon tax should not only be about the money but environmental sustainability should be the main focus.

Given the above, it would be a good idea for those behind the implementation of a carbon tax payment to establish a comprehensive system of payment that will cover all those in the country. This is important because if it is not done there is the possibility that businesses which cannot afford the tax might be forced to close. If businesses start closing it will affect the economy of the country leading to an increase in unemployment. Furthermore, a carbon tax can negatively impact low-income households in the form of a higher cost of living due to increases in the price of electricity. An increase in the petrol price would also impact on living costs in the form of higher transport costs, in particular taxi fees. Thus, low-income households would be set back even further in that they will be paying higher prices for

carbon used, the same prices as the rich, despite the latter possibly being responsible for emitting more. This will be taking place in a context in which GHG emissions are not decreasing. Based on this, I am inclined to think that due to the poverty rate in South Africa, a carbon tax policy should have not been implemented; rather, another method should have been considered. As much as the policy is there to lower GHGs, we have to acknowledge that the policy is more about boosting the economy. What this simply means is that irrespective of whether the policy achieves its aim of lowering carbon emissions, the economy will still benefit, and low-income civilians will still be negatively affected. As much as the policy is there to help in achieving sustainable development, I believe that South Africa could come up with a method that is more reasonable and equitable for the country as a whole.

5.2. Carbon Tax and the Ethical Theory of Environmental Stewardship

Environmental stewardship can be a useful tool in terms of individual and company (or firm) decision-making. This is elaborated on below.

5.2.1. Environmental Stewardship and Individual Responsibility for Pollution

According to Daniel Kahneman and Amos Tversky, "the behavior and decision making of a self-interested individual will reflect the higher values placed on goods owned by that individual, referred to as the endowment effect" (1979). Each and every person on this earth has the ability to make decisions that either favour the goods that they own or seek to protect. Jon Pierce, Michael O'Driscoll and Anne-Marie Coghlan give a good example of this. Their example is based on the idea of separating individuals, children and the elderly "from their possessions to illustrate this endowment effect" (2003: 85). They explained that "ownership feelings and 'self-identity' may be tied up with physical objects but also with facets of employment where a person strongly identifies with a particular profession" (Pierce *et al*. 2004). It is, therefore, important to point out that the feelings of ownership

are not narrowed down to private goods only, but they also apply to communal goods. For example, the feelings of ownership also apply to entire ecosystems or landscapes.

The connection between the feelings of ownership and environmental stewardship rests on the core values of an individual's decision-making. The feelings of ownership and environmental stewardship are "built on the hypothesis that a person's core values form a foundation of consistent ethical values and goals leading to a set of moral norms and aspirations that influence individual decision making and behavior" (Worrell and Appleby 2000; Van Slyke 2007). Environmental stewardship, therefore, takes into consideration the fact that there may be a situation where individuals can be stewards of a certain entity or set of entities, and with that in mind, the ideas of responsibility, autonomy, trust, goals, visions and reputation enhancement apply. With the help of environmental stewardship, an individual becomes fully aware and develops the above-mentioned qualities, because he or she values that which he or she has ownership of. As a result, the individual can make decisions that protect what he or she has and, at the same time, take full responsibility for their actions.

Environmental stewardship "provides a general framework for the relationship between attitudes, beliefs, intentions, and behavior" (Azjen 2001). This theory can, therefore, assist in changing the behaviour of emitters enabling them to make good decisions that will help sustain the environment. Each and every person has a responsibility and an obligation to protect the environment. We need the natural environment as much as it needs us to conserve it and we cannot survive without it. As individuals, making good decisions while being aware that we are stewards of the environment, is a good step that would help lower GHG emissions in South Africa. With this in mind, it is important to underscore that individuals, through their beliefs and attitudes, can be good stewards of the environment and that good decision-making about the things that affect the environment could help in reducing GHGs in South Africa. Environmental stewardship can thus promote responsible citizenship in this country.

Considering the discussion above, the question that comes to mind is: Can communal decision-making do a better job than individual decision-making when it comes to the issue of lowering or curbing GHGs? The subsection below responds to this question.

5.2.2. Environmental Stewardship and Community Responsibility

Most decisions made have been thought through and processed individually. A decision that has been processed by an individual and based on values and beliefs is capable of either harming or benefiting a community and the natural environment. Thus, when "such normative values are shared by others, and collective goals overlap, it is shown that there is an increased likelihood of that person acting in the interests of achieving collectively shared objectives" (Van Slyke 2007; Mills and Keast 2010). Samuel Bowles agrees with this when he says that "the likelihood of collective objectives will be greatest where self-interest and normative values align and are shared within a group. Where this is not the case, the opposite may result" (2004). According to Mark Van Vugt, "research on long-term sustainability and stewardship outcomes at a collective level in a common property context shows that this is mediated by several variables such as access to adequate information, information sharing, and engagement" (2009). This means that a communal or collective decision-making method brings out a variety of ideas, information, trust and options that lead to a better decision being made. Furthermore, "trust has an important influence on the acceptance by individuals of the costs borne in the interest of resource sustainability" (Caddy and Seijo 2005). Given this, I am inclined to think that environmental stewardship is grounded on communal mutual understanding of trust and cooperation. With environmental stewardship and consensual communal understanding and decision-making, a carbon tax can be effective as there are information sharing and engagement concerning reducing the level of GHG emissions.

Given that we already know that environmental stewardship "provides a general framework for the relationship between attitudes, beliefs, intentions, and behaviour", it can, therefore, assist in changing the behaviour of community members, enabling them to make good decisions that will help sustain the environment. If individuals in the community become aware that they are stewards of the environment they can work as a collective

group to come up with well-deliberated decisions that will help sustain the environment. With community members being unified, a good decision can be made as different views would be considered before the final decision. This clearly shows that there is a higher possibility of making good decisions as a community than as an individual. Based on this, therefore, I can firmly say that when it comes to the issue of reducing or curbing GHGs, communal decision-making stands a better chance of coming up with better solutions than individual decision-making.

5.3. Conclusion

This chapter aimed to ethically interrogate the payment of a carbon tax as a means to reduce GHG emissions in South Africa. This was achieved by analysing the findings of the research through the lens of sustainable development and environmental stewardship. This chapter was divided into two sections: The first section analysed a carbon tax payment through the lens of sustainable development. Given this, I argued that a carbon tax policy alone cannot repay the damage done to the environment. Also, I briefly argued that a carbon tax policy alone cannot curb environmental pollution and it also cannot stop people from polluting. In the second section, I discussed carbon tax and the ethical theory of environmental stewardship. I examined environmental stewardship in terms of both individual and community responsibility and decision-making.

The next (and final) chapter concludes the study. It comprises a summary of the study, recommendations, the focus for further research, a call to action and a conclusion.

Chapter Six

Summary, Recommendations and Conclusion

6.0. Introduction

The previous chapter comprised the analysis of the research findings. It ethically interrogated the carbon tax policy in South Africa starting with its aims and objectives and the amount that has been set. The policy was thus interrogated in the South African context and analysed using the ethical theories of sustainable development and environmental stewardship. The current chapter is the concluding chapter of the dissertation. It comprises a summary of the chapters that were previously discussed, the recommendations that emerged from the study, a focus for further research, a call to action and a conclusion. The main aim of the study was to ethically examine environmental pollution and climate change and to ethically interrogate the payment of a carbon tax as a means to reduce GHG emissions in South Africa.

6.1. Summary of the Chapters

Chapter One, the introductory chapter, provided an outline of the study. It comprised the objectives, research questions, method and methodology, and a summary of the theoretical frameworks that were used in the study. In doing so the chapter served as a guide to the study. Due to the global pandemic (COVID 19), the study adopted a descriptive and exploratory methodological design and a desktop approach was used to respond to the vital areas of the study. The study is South African based and, as such, it examined the policy from a South African perspective. Finally, the study was motivated by the love I have for the environment and for wanting to make a positive change to the environment.

Chapter Two focused on environmental ethical issues. These environmental issues were, in the main, environmental pollution and climate change. The chapter evaluated what scholars from different academic fields have said about the two issues. The chapter was

arranged thematically. The first section defined and discussed environmental ethics and the African view of environmental ethics. The second section discussed Segun Ogungbemi's understanding of the environmental crisis. The third section discussed environmental pollution, the different types of pollutants (highlighting the different categories of environmental pollution) and the effects of environmental pollution on humans and non-humans, including the issue of climate change.

Chapter Three explored what a carbon tax is and what it means in the South African context. It further explained and discussed the structure of the South African carbon tax policy. By so doing, it provided a deeper understanding of the policy including aspects such as allowances, phases and how emissions are measured. The main reason for the chapter was, therefore, to offer an understanding of a carbon tax policy from the South African point of view.

Chapter Four comprised the theoretical framework. The theories that guided the study were discussed, namely, sustainable development and environmental stewardship. The chapter began with a discussion of the ethical theory of sustainable development and in doing so the two terms sustainability and development were explained. From there, the theory was broken down into three pillars, that is, the environment, society, and the economy. These pillars and the intersection between them were explained. The chapter then discussed sustainable development in the South African context. This was followed by a discussion of the ethical theory of environmental stewardship. The theory was explained and the arguments for and against the theory were provided. The final part of the chapter discussed the connection between sustainable development and environmental stewardship.

Chapter Five consisted of the analysis of the findings. This chapter was an important one in that it ethically analysed and interrogated carbon tax as a means to reduce GHG emissions in South Africa. This was achieved by analysing the findings of the research through the lens of sustainable development and environmental stewardship. The chapter was divided into two sections and in the first section, carbon tax was examined through the lens of sustainable development. I examined each of the three pillars separately starting with the economy and then moving on to the environment and society. Section two looked

at carbon tax through the lens of environmental stewardship. In this section, I examined how individual and community decision-making strategies could help in promoting responsible citizenship. The chapter, as with previous chapters, ended with a conclusion.

Chapter Six comprises a summary of the study, the recommendations and a conclusion. It starts with a summary of the study. The content of each chapter of the study is briefly outlined including the main aim/s of each. The next section is the recommendations – these are solutions that the study thinks can be applied. The recommendations serve as a means to encourage South African citizens and the government to take environmental sustainability seriously. A focus for further research and a call to action are then made and a conclusion brings the study to an end. The conclusion is important in that it explains whether the study was able to answer the ethical research questions asked. It also indicates whether the objectives of the study were met.

6.2. Recommendations

Climate change and environmental pollution are global problems that need to be addressed and mitigated, and the new carbon tax policy implemented by the South African government will help in lowering GHG emissions. The implementation of a carbon tax can be successful if there is a mutual understanding between South African citizens and the government. However, the findings of this study have revealed that environmental education may be one of the main things that is needed by South African citizens. With that said, there can be environmental campaigns that can be prominent and effective (such as the coronavirus (COVID 19) campaigns), and that are available to all citizens and open to everyone. Campaigns that will focus on environmental awareness using all sorts of communication platforms are needed.

6.2.1. Environmental Education/Awareness

For the sake of these recommendations, education and awareness are used interchangeably. I recommend that the government works together with community leaders to implement environmental awareness campaigns that will communicate knowledge on the importance of sustaining the environment. These campaigns should also educate people on new laws

concerning the protection of the environment, for example, the newly implemented carbon tax policy. People should be educated about it so that when the prices of the carbon induced goods (such as electricity and petrol) increase, they can understand why that is happening.

The reason why community members are needed is that they can help with obtaining and communicating indigenous knowledge relating to the environment and its sustainability. With the use of community leaders, a lot can be achieved as African people respect and listen to their elders and chiefs. The indigenous knowledge system is a traditional way that African people pass down knowledge, not only in rural areas but also in some urban areas as well. For example, information is passed down through folktales, proverbs and storytelling. This kind of knowledge is usually used by the community members because it is in a language that is spoken by them and thus easier to comprehend. With the aid of indigenous knowledge, both younger and older generations will know about the importance of sustaining the environment.

Focus groups would also be of help in educating people about the importance of the environment. With the aid of focus groups, people will be able to understand what carbon tax is all about and be able to ask questions about it. Focus groups are important in that they are intimate and more knowledge can be passed on via the use of small groups. A carbon tax is one of the strategies that has been implemented to lower carbon emissions. Focus groups would be able to assist in obtaining other solutions to how carbon emissions can be lowered. As much as a carbon tax is one of the solutions implemented, more can be done about the issues of climate change and environmental pollution.

6.2.2. Research Focus

In light of what has been discussed in the dissertation, it is evident that what has been discussed is only a part of a larger discourse on environmental pollution, climate change and carbon tax. It would thus be good for researchers to continue to engage on issues concerning carbon tax and its connection with environmental pollution and climate change. This is because the topic is of great importance to the world at large. Thus, more research could be done on the above-mentioned ethical environmental issues and their link with a

carbon tax. Furthermore, I think that a carbon tax policy can be researched from the perspective of any discipline or field of study.

6.2.3. Time to Take Action

According to Greta Thunberg, "we have had 30 years of pep-talking and selling positive ideas, but I am sorry it doesn't work because if it would have the emissions would have gone down by now… and yes we do need hope of course we do but one thing we need more than hope is action".[26] This is true because there is no longer time to be talking positive ideas – we know what the problem is and what causes it. Action is now needed as are solutions that will not only be on paper but that will be practical too. I have to say that South Africa took the moral step in implementing a carbon tax; now we all have to take action to lower the effects of carbon emissions not only for ourselves but also for future generations.

6.3. Conclusion

As noted previously, South Africa has been ranked as the 14th largest CO2 emitting country in the world. Therefore, the country has to be guided by ethical and justice strategies that work towards lowering carbon emissions. The implementation of a carbon tax is an ethical step that will help to reduce GHGs for the sustainability of the environment. As environmental stewards, a lot can be done to reduce carbon emissions. Each and every person can take full responsibility in ensuring that the environment is sustained for both present and future generations. Environmental stewardship is important because it can help in sustaining and caring for the environment. It can also help us become more aware of our environment, forcing us to take full responsibility for whatever decisions we make concerning the environment and its sustainability. As environmental stewards, our attitude to the environment will change and we will develop a deeper moral responsibility that can contribute to ensuring a sustainable environment. Importantly, the idea of stewardship can help in our understanding of how crucial the environment is and why we should respect it.

[26] See the interview on https://www.youtube.com/watch?v=H2QxFM9y0tY accessed on 20 June 2020.

A carbon tax is an ethical step that South Africans have taken in meeting their commitment to reducing GHG emissions. With the implementation of a carbon tax, I believe that emitters can be held responsible for the pollution caused to the environment. If a carbon tax is taken seriously, the polluter will pay irrespective of whether they agree to do so or not and, because of this, they will be forced to change their attitudes and beliefs towards the environment. A carbon tax will not only benefit the present generation but future generations as well, as they will have, given the current situation of environmental pollution and climate change, an improved and good quality of air. Thus, if the above is taken seriously, not only will South Africa be meeting the commitments of the Paris Agreement and the Nationally Determined Contribution (NDC) but it will be resolving the issues that climate change and environmental pollution cause. A carbon tax takes into consideration every aspect of life, from the environment and the economy, to society. If the carbon tax policy is correctly implemented and taken seriously, it can help in boosting the economy and lowering climate change and pollution. If the above is achieved there is a great chance that improved air quality will result.

A carbon tax alone cannot ensure the sustainability of the environment. However, given that South Africa is still a developing country struggling to keep the economy together, I do think it is important to underscore that the tax is a good, important and ethical step towards the reduction of GHG emissions in South Africa and is certainly better than doing nothing at all. Although I accept that as much as a carbon tax is a good strategy for mitigating climate change, environmental pollution and reducing GHGs, it is possible that such a tax might cost the country more than what it bargained for. Whether the carbon tax does so or not depends on how it is implemented. Thus, it is the responsibility of everyone, as environmental stewards, to work towards the sustainability of the environment for all inhabitants, including biotic and non-biotic organisms.

Lastly, this study has responded to the objectives outlined in Chapter One. It has ethically analysed and evaluated the carbon tax policy as a means to reduce the GHG emissions in South Africa. The study has met the objectives by first defining what environmental pollution is. It then looked at the consequences of environmental pollution including the global ethical environmental issue of climate change. The effects that these environmental

issues have on the biotic and non-biotic organisms were examined. Lastly, the study explored how the ethical theories of sustainable development and environmental stewardship can strengthen the carbon tax policy thereby leading to the sustainability of the environment.

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Appendix 1: Proof of Editing Letter

Athol Leach (Proofreading and Editing)

31 Park Rd
Fisherhaven
Hermanus 7200
Email: atholleach@gmail.com Cell: 0846667799

5 December 2020

To Whom It May Concern

This letter serves to confirm that I have edited the following Master's Dissertation (Ethics) by ZAMA NONKULULEKO MASONDO (216046979):

"Environmental Pollution and Climate Change: An Ethical Interrogation of the Payment of Carbon Tax as a Means to Reduce Greenhouse Gas Emission in South Africa"
The document has been edited in terms of grammar, spelling, punctuation and overall style. In doing so use was made of MS Word's "Track changes" facility thus providing the student with the opportunity to reject or accept the changes made. Please note that while I have checked for consistency of the in-text referencing in terms of format, I have not checked references as they appear in the Bibliography for either completeness (in terms of bibliographic information) or consistency of format.

The tracked document is on file.

Sincerely
[redacted]

Athol Leach
(MIS, Natal)