A critical analysis of green economic policies in South Africa

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List of Abbreviations

AFOLU	Agriculture, forestry and other land use
AFRICEGE	African Centre for a Green Economy
ANC	African National Congress
APB	Alliance for Brazil
ASMARE	Association of Collectors of Paper, Cardboard and Reusable Material
ATLAS	Climate Change Adaptation, Thought Leadership and Assessments
BRICS	Brazil, Russia, India, China and South Africa
BRT	Bus Rapid Transit
CEM	Centre for Environmental Management
CEMPRE	Compromisso Empresarial Para Reciclagem
CO_2	Carbon dioxide
COGTA	Department of Co-operative Governance and Traditional Affairs
CONNEPP	Consultative National Environmental Policy Process
CRED	Centre for Research on the Epidemiology of Disasters
DAFF	Department of Agriculture, Forestry and Fisheries
DBSA	Development Bank of Southern Africa
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
DoE	Department of Energy
DST	Department of Science and Technology
DTI	Department of Trade and Industry
DWS	Department of Water and Sanitation
ECA	Environmental Conservation Act
EDD	Economic Development Department
EIA	Environmental Impact Assessment

EPWP	Expanded Public Work Programme
E-waste	Electronic Waste
GDP	Gross Domestic Product
GEC	Green Economy Coalition
GGEI	Global Green Economy Index
GHGs	Greenhouse Gases
GNI	Gross National Income
GVA	Gross Value Added
IBGE	Brazilian Institute of Geography and Statistics
IDC	Industrial Development Corporation
ILO	International Labour Organization
IPAP	Industrial Policy Action Plan
IPCC	Intergovernmental Panel on Climate Change
IPEA	Instituto de Pesquisa Economica Aplicada
IRP	Integrated Resource Plan
IWMP	Integrated Waste Management Plan
KEQs	Key Evaluation Questions
LCP	Law on Public Consortia
LTMS	Long Term Mitigation Scenario
MEC	Minerals-energy complex
NCCRP	National Climate Change Response Policy
NCCRWP	National Climate Change Response White Paper
NCCS	National Climate Change Strategy
NCE	New Climate Economy
NDP	National Development Plan – Vision for 2030
NEM:WA	National Environmental Management: Waste Act
NEM:WAA	National Environmental Management: Waste Amendment Act

NEMA	National Environment Management Act, 59 of 2008
NGOs	Non-Governmental Organizations
NGP	New Growth Path
NPC	National Planning Commission
NPSW	National Policy on Solid Waste
NSSD	National Strategy for Sustainable Development and Action Plan
NT	National Treasury
NWIR	National Waste Information Regulations
NWMS	National Waste Management Strategy
OECD	Organisation for Economic Co-operation and Development
PAGE	Partnership for Action on Green Economy
PNAD	National Household Sample Survey of Brazil
PNMA	National Policy on the Environment
PNRS	National Solid Waste Policy
PNSB	National Policy on Basic Sanitation
R$	Brazilian Real
REIPPPP	Renewable Energy IPP Procurement Programme
Rio+20	United Nations Conference on Sustainable Development
SACN	South African Cities Network
SAWEP	South African Wind Energy Technology Programme
SAWPA	South African Waste Pickers' Association
SELUR	Sindicato das Empresas de Limpeza Urbana no Estado de São Paulo
SLU	Public Cleansing Agency
SWH	Solar water heater
SWHP	Solar Water Heating Programme
SWHs	Solar Water Heaters
TIPS	Trade and Industrial Policy Strategies

UCS	Union of Concerned Scientists
UN	United Nations
UN Data	United Nations Statistics Division
UN-DESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
WML	Waste Management License

CHAPTER 1:
A CRITICAL ANALYSIS OF GREEN ECONOMIC POLICIES IN SOUTH AFRICA

ABSTRACT

Contemporary capitalism and the neoliberal discourse it often perpetuates have, over the past few decades, led humanity to experience many different systemic crises. This dissertation will be aimed at highlighting one systemic crisis that threatens to annihilate humanity's very existence – the climate crisis. Although the recognition of pressing ecological concerns is becoming more conventional (outside of the environmental sciences realm), the global response to the climate crisis thus far remains vastly inadequate, and a general sense of urgency regarding rapid and extensive climate change mitigation is sorely lacking. Both nationally and internationally, more can be done in relaying how crucial it is for all countries, developed or developing, to break ground on this issue, and address it accordingly – which is what this dissertation intends to do. The main aim of this dissertation, therefore, is to further investigate and highlight this issue by analysing South Africa's green economic policy response to the climate crisis. Research on this particular topic is crucial, not only in a broader sense to mitigate the climate crisis, but also to initiate important dialogues on the matter within the South African policymaking sphere.

Keywords: climate crisis, ecological economics, green economy, green economic policy, South Africa

1.1 OVERALL INTRODUCTION TO THE STUDY

As a direct result of the vast accumulation of economic growth, and the accompanying unrelenting power that wealth yields whilst striving for opulence, the Earth's natural systems have been ravaged (Pilling, 2018). As such, humanity is facing an unprecedented climate crisis. The Earth is currently experiencing a 1.2 °C increase in planetary temperature, with increases starting at the time of first industrial revolution (Satgar, Cherry & Adam, 2018). Additionally, atmospheric levels of carbon dioxide (CO_2) were recorded to have surpassed 415 parts per million in 2019, which is the highest level that has ever been recorded since the evolution of humankind (Dockrill, 2019). These are the latest in a dire series of climatic thresholds being

breached by a human society that refuses to relinquish the conveniences afforded through the exploitation of the Earth's natural resources.

These statistics and a recent spike in climatic disasters occurring worldwide, coupled with the fact that the human population is very likely to exceed ten billion in only a few decades, certainly stress the immense importance of urgent and extensive climate change mitigation (Jackson, 2017). Unfortunately, the window of opportunity for effective action is extremely narrow – two or three decades at the very most is estimated (Ceballos, Ehrlich & Dirzo, 2017). Thus, the time for radical policy action is now: as mounting climate science evidence shows, a thriving global society is dependent on the stable functioning of Earth's systems (Griggs, 2013). Ultimately, if humanity is to avoid irreversible damage being done to basic Earth-system processes, a collective, widespread effort is needed to drastically reduce CO_2 levels. This, however, can only be done if we recognize the importance of the issue at hand, as well as the severity of the impacts that it will have, if we do not.

Certainly, the severity of the climate crisis will be felt more profoundly in low-income and developing countries that are already plagued with a multitude of socioeconomic challenges (Adaptation, Thought, Leadership and Assessments (ATLAS), 2018). Inevitably so, the climate crisis will threaten development and trigger worldwide humanitarian crises; thus creating and deepening prevailing inequalities and injustices. Moreover, sixteen countries within Africa have recently been identified as being exceptionally vulnerable to climatic disasters (Nintereste, 2018). Accordingly, the climate crisis cannot be considered an 'elitist' issue; it has become a humanitarian concern that elicits catastrophic consequences for developing and developed countries alike (Shahbaz, Mahalik, Shah & Sato, 2016).

The most recent and comprehensive report on climate change (based on the assessment of approximately 6000 peer-reviewed publications, alongside insights from hundreds of scientists) published by the Intergovernmental Panel on Climate Change (IPCC) (2018) explicitly states that the effort to inhibit anthropogenic[1] global warming within the 1.5 °C Paris Agreement limit will require global net emissions of greenhouse gases (GHGs) to be approaching zero by the year 2050. However, it is projected that humanity only has until the year 2036 before the increase in global

1 Anthropogenic phenomena explain humanity's impact on the environment (McRae, 2019).

temperatures exceeds 2 °C – a change in temperature at which 17 of 37 irreversible ecological tipping points, at the very minimum, will have been breached (Satgar *et al.,* 2018). The difference between an increase of 1.5 °C and 2 °C is remarkably large in how it impacts the environment; for example, a 0.5 °C difference would imply that the length of droughts would double, the occurrence of extreme climatic events would be more than twofold, and all the Earth's coral would vanish (IPCC, 2018).

The climate science consensus is thus clear; carbon-driven economic growth and carbon-centric energy production have to be eradicated in order to prevent changes in planetary temperatures from overshooting 1.5 °C. Currently, however, GHG emissions are certainly not slowing down and the widespread use of carbon capital is ever-increasing, having reached an all-time high in 2018 (Harvey, 2018). It is therefore of the utmost importance that attempts to curb climate change be rigorously enacted throughout all disciplines. It is, however, especially necessary for the economics discipline to be engaged in this topic; after all, economic forces have long been identified as being the major driver of the massive current CO_2 problem (Oswald & Stern, 2019). Additionally, economics has influenced the world as we know it more so than any other social sciences discipline; capitalist activities, political discourses and countless institutions (banks, finance ministries, governments and the like) have all been indefinitely shaped and permeated by the economic sciences discipline (Fourcade, Ollion & Algan, 2015).

Moreover, and very importantly, economists play a pivotal role in guiding the policy framework that will influence the investment decisions of the future (Oswald & Stern, 2019). As action on climate change is arguably the greatest current challenge for public policy, it is quintessential that the profession lead in the field of climate change mitigation efforts (Oswald & Stern, 2019). Despite all of this, however, the economic sciences discipline remains largely removed from engagements regarding the climate crisis; for example, the Quarterly Journal of Economics, the most-cited journal in economics, has yet to publish an article on climate change (Oswald & Stern, 2019). This dissertation, therefore, aims to address this general lack of engagement by economists, specifically by analysing South Africa's green economic policy response to the climate crisis.

1.1.1 Problem statement

South Africa's contribution to increases in hazardous GHG emissions, quite contrary to other African countries (and other developing countries in general), has been paramount. The latest available data on CO_2 emissions indicates that South Africa's CO_2 emissions had almost tripled from 1975 to 2014 (from 185 202 thousand tons to 489 772 thousand tons respectively) (United Nations Statistics Division (UN Data), 2017). Accordingly, South Africa is placed firmly amongst the top twenty countries in the world that emit the most CO_2 emissions per year (Union of Concerned Scientists (UCS), 2019). Furthermore, the South African oil conglomerate, SASOL, has recently been identified as one of the top 100 fossil fuel companies linked to 71% of global industrial GHGs (Bloom, 2019). Hence, on the cusp of a climate emergency, it is imperative that a better overall understanding is gained regarding the current green economic policies of South Africa. Currently, however, a critical synthesis regarding the literature on green economic policies in South Africa is sorely lacking.

This dissertation, therefore, will be critically analysing the South African policy response to the crisis and the literature that has been influential in the construction and adaptation of the various green economic policies within the country. An enhanced knowledge and better understanding of the current green economic policies in South Africa is of significant importance within the current climate crisis. Moreover, South Africa's green economic policy landscape is immensely complex and fragmented. Numerous departments and institutions govern over a myriad of policies and plans, which makes the matter of obtaining a coherent, all-encompassing understanding of South Africa's green economic policies exceedingly difficult; once more reiterating the significance of this study. This dissertation will therefore consist of two separate research articles in order to answer the broader research question at hand; what is the scope and depth of green economic policies in South Africa?

In order to answer this broader question, this dissertation has been divided into two articles. The research question of the first article seeks to understand what the state of green economic policies is in South Africa. This addresses the scope of green economic policies in South Africa and as such, the first article will consist of a systematic literature review regarding the literature on green economic policies in

South Africa. Having engaged in a preliminary review of the literature, one specific policy sphere warranted further investigation: South Africa's waste management policies. Article 2 therefore addresses, in depth, a specific green economic policy by examining how South Africa's waste management policies compare with Brazil's waste management policies.

This green economy policy was deemed vital and pertinent as the waste sector within the country is predominantly based on unsustainable, polluting waste disposal methods. In 2017, South Africa generated 42 million tons of waste, of which only 11% was diverted from landfills (Department of Environmental Affairs (DEA), 2018). Additionally, according to the DEA (2019), for every 38 million tons of waste, only 7% is reused or recycled. Moreover, within the waste management policy framework exists a paramount, yet squandered, opportunity to incorporate the informal economy, in the form of waste pickers, into South Africa's green economic transition. As an inclusive approach to sustainable development is integral to the success of green economic policy within the country, the importance of this topic cannot be overstated, as it presents a stepping stone for policymakers to initiate an integrated approach to green economic policy development. In order to compare international best practice in this regard, it will be necessary to embark on a comparative case study analysis of South Africa's policy approach in relation to Brazil's, a country known for its best practice in integrated waste management practices, within the second article of this dissertation.

1.1.2 Research objectives

1.1.2.1 Primary objective

The primary objective of this dissertation is to determine the scope and depth of South Africa's green economic policies.

1.1.2.2 Secondary objectives

For the study to achieve its primary objective, these two theoretical objectives are pursued:

- Conduct a systematic literature review on the literature surrounding South Africa's green economic policy, and critically analyse any forthcoming insights garnered from the review.
- Conduct a comparative case study analysis, comparing Brazil's renowned waste management sector with that of South Africa's, in order to determine the best practice for greening the waste management sector.

1.2 Theoretical perspectives

In order to better ground the work of this dissertation, it is useful to briefly engage with the underlying theoretical foundations that have informed both articles. The specifics of these theoretical contributions will be discussed in more detail when applicable within the articles. However, these theoretical contributions have elicited rigorous debate, and as such, it is necessary to be clear on what the point of departure for this dissertation is, as this has informed the subsequent analysis.

1.2.1 Ecological economics

In the long and particularly winding history of the development of economics, the emerging environmental concerns were, for the most part, regarded as inevitable negative externalities; left for other sub-disciplinary specialists to address (Spash, 2011). At the opposite end of the spectrum, ecological economics analyses the sustainability of current economic and social systems and the consequent effects of these on the earth's natural systems (Costanza, Daly & Bartholomew, 1991). The precise definition of ecological economics, as in the case of numerous other economic concepts, is difficult to pinpoint, as general agreement of such has not yet been reached (Ropke, 2004). However, many academics recognize that ecological economics, in its simplest form, distinguishes the many interdependent ways in which economies and markets are inadvertently intertwined with ecological issues, and places ecological matters at the forefront of issues relating to economic development.

Ecological economics is a trans-disciplinary field of economics, which can be traced to its origin well back in the 1800s (Fischer, Hasell, Proctor, Uwakwe, Ward-Perkins & Watson, 2018). However, it was not until the early 1990s that ecological economics truly gained ground and became more pertinent in several mainstream

economics journals (Spash, 1999). This particular branch of economics gained prominence at the time mainly because most populist economic concepts were proving to be inadequate in their ability to address rising global ecological catastrophes (Costanza *et al.,* 1991). Only in recent years, however, have the effects of increased ecological degradation been felt more severely, as the push for economic activity has risen, alongside exceedingly little consideration for the environmental impacts of pursuing unrelenting economic growth. This has meant an increased recognition of the significance of ecological economics. Indeed, American economist, William Nordhaus, won the 2018 Nobel Memorial Prize in Economic Sciences for his influential work on ecological economics.

Being a trans-disciplinary field of economics, the formulation of the foundation of ecological economics consisted of the merging of various different strands of economics, numerous disciplines and contributions from many scholars from different fields (Spash, 2011). Within the current climate, this renders ecological economics as being a particularly instrumental branch of economics; for in order to sufficiently tackle the complex, existential threat that the climate crisis embodies, humanity has to look to a field that is both nuanced and rigorous, i.e. trans-disciplinary. By better understanding the various relationships linking economic systems and ecological issues from such a nuanced perspective, academics and policymakers are better equipped and enabled to build a sustainable, truly circular economy, whilst mitigating various environmental concerns and crises (Costanza *et al.,* 1991). This dissertation will thus be utilizing this school of thought extensively as a lens to look through when examining various economic concepts and bodies of literature.

1.2.2 Green growth versus de-growth

Whilst the aim of this dissertation is not to unpack all the various green economic theories and the precise philosophical underpinnings these possess, it is important to note that the green economy can be interpreted in numerous ways, each with vastly different ideologies and consequences for sustainable development. The policies that will be mapped and critiqued within Article 1 overwhelmingly support and promote the green growth trajectory, however, the stance of this dissertation is one that is in support of de-growth for developed countries rather than green growth. As

South Africa is in many respects still a developing[2] country, it is largely accepted that we would adopt a green growth approach (Rodseth, Notten & Von Blottnitz, 2020).

De-growth theory, in essence, refers to significantly reducing the material throughput of economies and consumption rates, which ultimately slows down economic growth (Hickel, 2020b). Hickel (2019) states that only when doing so, can society truly transition to clean energy, and fully decarbonize all polluting industries. This argument is echoed by many, including the most recent IPCC (2018) report (a report based on the assessment of around 6 000 peer-reviewed publications, alongside insights from hundreds of scientists). It should be noted, however, that de-growth cannot be equated with a recession, as there are very fundamental differences between the two concepts (Hickel, 2020b). De-growth is an actively pursued and coherent policy initiative that aims to decrease environmental impacts, improve inequality, and advance social well-being (Hickel, 2020b). Recessions, on the other hand, are not planned, and do not target any of the objectives that de-growth pursues (Hickel, 2020b).

As South Africa has not adopted a de-growth approach, this dissertation has assessed South African policies on their attempts to ensure green growth. A de-growth trajectory is not an expected position for South Africa to take as a developing country. De-growth theory does acknowledge that this is a path that needs to be prioritized by developed countries in order to "buy time" for developing countries to ensure that their economic growth results in increased economic development (Hickel, 2020b). The consideration of de-growth is, however, still important for South African policymakers, as the statistics above have shown. Being ranked within the top 20 emitters of CO2 per year means that we find ourselves in the position of needing to question how soon the de-growth debate becomes relevant to our future economic policy proposals (UCS, 2019).

The concept of de-growth, a radical alternative to current sustainable and non-sustainable development paths, is thus to be contrasted with green growth to highlight the broader debates on ecological economics. This has implications for

[2] It should be noted here that there is an ongoing debate surrounding the classification of South Africa as a developing country, as it is a middle-income country which possesses various characteristics of a developed country, for example, the sophistication of the country's financial markets. However, South Africa is mostly still regarded as being a developing country, due to high instances of poverty, widespread unemployment and an extremely high inequality rating (World Bank, 2018d).

South African policymakers who need to consider the importance of a de-growth approach going into the future.

Of the many notions related to the green economy, green growth has been gaining the most popularity (Hickel & Kallis, 2019). Within this theory, persisting, increasing economic growth is considered to be achievable within our planet's limited natural resources. Therefore, it is no surprise that this particular theory is so popular worldwide; its promise to combine both green and economic objectives is certainly very alluring (Antal & Van Den Bergh, 2016). This theory advocates that, through technological advances driven by humanity's knack for innovation, economic activity will eventually be able to decouple from natural resources and carbon emissions (Mathai, de Oliveira & Dale, 2018). Within this narrative, policies such as high carbon prices for fossil conglomerates, deep decarbonization, energy efficiency standards, the phasing out of fossil fuel subsidies and increased support for low-carbon innovation are promoted, which will ultimately decrease carbon emissions (World Bank, 2012a; OECD, 2011b).

Green growth, although valuable in certain aspects, is often regarded as merely another instance where capitalism has been propagated as the only way forward (Mathai *et al.,* 2018). De-growth, by contrast, defies the usual discourse and asserts that a different, more radical developmental path is the only way forward. This theory maintains that in order to realistically combat the current climate crisis, nations would have to actively 'de-grow' their economies. This would require a fundamental shift in economic, political and social interactions, but it is important to grapple with this as we consider the already dire consequences of the climate crisis and how soon South Africa may have to interrogate its stance on this debate.

1.2.3 Institutional economics

Once more, an important springboard for the analysis within the two articles covered by this dissertation is an underpinning of institutional economics. Within institutional economics theory, the most well-known definition of an institution entails that it comprises the rules of the game in society, or in other words, the manmade constrictions that permeate human interaction and behaviour (North, 1992a). As economic policies are in essence rules by which various agents should play, this

type of theoretical understanding is valuable in assessing which institutions exist to promote green growth in South Africa, and which do not.

Institutions are generally self-sustaining and salient, combining formal rules (such as sanctions, property rights and codes of conduct) and informal rules (such as societal customs, cultures and traditions) (Meijerink, 2011). Economists who ascribe to this theory maintain that the differences found in countries' economic development trajectories are mainly due to the differences found between countries' institutions, whether they be formal or informal (Acemoglu, Johnson & Robinson, 2005). Institutions create the entire structure of society payoffs; a society will thrive if the appropriate policies are established and well maintained, for example. In the instance of green economic policies, the institutional argument would be that if the appropriate institutions (rules) exist and are implemented, then a thriving society, through the pursuit of green economic growth, could be fostered.

Institutions also influence the 'players' of the game, i.e. organizational structures, but can also in turn be influenced by the agents within these organizations, commonly referred to as the 'agents of change' (North, 1992b). These organizational players can take the form of political organizations and economic organizations, for example. The evolution of institutions, therefore, is certainly not a linear process.

Economic outcomes, for example, are shaped by economic institutions as they influence the incentives of and the limitations on the various different economic players (Acemoglu *et al.,* 2005; North, 1992a). Economic institutions may benefit different groups/individuals in various ways to varying degrees; hence, conflict often exists over the consequential decisions economic institutions result in taking (Acemoglu *et al.,* 2005). More often than not, however, these conflicts are resolved in favour of those who possess superior political power (Acemoglu *et al.,* 2005). Political power, and the different ways in which it is structured and distributed, is influenced by political institutions as well as the allocation of resources (Acemoglu *et al.,* 2005). However, the allocation of resources (and in the instance of this dissertation's analysis, the allocation of natural resources) is also influenced by prevailing economic institutions (Acemoglu *et al.,* 2005). This illustrates once more the fact that institutions evolve dynamically.

Utilizing an institutional lens within this dissertation is useful for a number of reasons. Firstly, to better evaluate policies, which are in essence the 'rules of the game'. Secondly, to assess the role the promulgators (players) of these policies have had thus far in establishing and incorporating green economic objectives. Thirdly, to determine which agents of change, i.e. economic/political players, are inhibiting or facilitating South Africa's transition towards a green economy. Lastly, an institutional approach is also useful, given that a plethora of different frameworks, initiatives and policies has evolved thus far, and that numerous agents are currently involved in the green economic transition process. This dynamic policy space requires a dynamic theoretical perspective such as institutional theory, which acknowledges that institutions are not static and malleable to change. Additionally, an institutional underpinning is sufficiently appropriate for Article 2 of this dissertation, given that a more in-depth analysis is made of the particular institutions that govern the South African and Brazilian waste management sectors.

1.2.4 Neoliberalism and the green economy

Neoliberalism, although defined and interpreted in many different ways, is framed within this dissertation as the latest prevailing capitalist paradigm. Neoliberalism, in short, can be described as an economic ideation that encourages free market principles (Brown, 2003). For example, free trade accomplished through economic deregulation and tariff elimination, maximized competition, and monetary and social policies which favour profit and the welfare of businesses with little regard for consequent issues such as poverty, resource depletion, environmental destruction and cultural decimation (Brown, 2003).

Although varying strands of critique have emerged over this popularized concept, this dissertation's main criticism arises from the lacklustre manner in which neoliberal ideologies cast all dimensions of life, including the ecology, in terms of their market value and rationality (Hardin, 2014). In the face of the current climate crisis, neoliberalism is a vastly inadequate economic trajectory, as it promulgates economic stability and prosperity to be above all other socioeconomic, socioecological, ecological and civil liberties (Brown, 2003). Moreover, phenomena such as modern globalization, financialization and individualism are attributed to neoliberal concepts and principles (Hardin, 2014). These phenomena are problematic in the capitalistic

manner in which they have been interpreted and encourages consumeristic behaviour and environmental degradation significantly (Cock, 2014).

Despite concrete evidence (see, for example, Harvey, 2005; Schneider, 2003) that policies influenced by neoliberal discourse has increased social inequality and dampen environmental rights and radical climate change mitigation movements (Cock, 2014), the South African government (alongside numerous other states) still resolutely propagate and abide by neoliberal principles (Leonard, 2018; Bond, 2002). As is discussed in more detail within Section 2.5.3 of this dissertation, neoliberal ideation has seeped into environmental theory regarding the green economy, predominantly in the form of ‘green growth'. The issue of pursuing a neoliberal green economic trajectory is clear; the current climate crisis requires a green economy that encapsulates a new economic paradigm in its entirety (Neusteurer, 2017). The global hegemonic capitalistic world order should be fundamentally altered by green economic efforts, not encouraged, if we wish to mitigate the climate crisis (Neusteurer, 2017).

CHAPTER 2
ARTICLE 1: GREEN ECONOMIC POLICIES IN SOUTH AFRICA – A SYSTEMATIC REVIEW OF THE LITERATURE

ABSTRACT

This article aims to strengthen green economic policy research within South Africa by offering a systematic literature review of existing research in green economic and environmental policy literature. As climate change is recognized by the United Nations (UN) as the most significant human development challenge of the 21st century, research on climate-change mitigation efforts, i.e. green economic policy, is currently pivotal (Davis-Reddy & Vincent, 2017). Doing so is vitally important, as the literature review shows that green economic policies in South Africa are fundamentally fractured and thus associated with a lack of coherence, making it exceedingly difficult for policymakers in particular (as well as researchers and civil society) to drive an agenda towards a green economic transition. By making use of a systematic literature review method, 54 empirical and non-empirical studies were mapped and analysed, spanning more than two decades. The article concludes by

identifying a new research agenda that is informed by the systematic literature review and makes proposals for moving forward policy research on the green economy. In particular, greater research attention should be given to the following identified themes: 'over-dependency on brown development', 'continued commodification of nature' and 'lack of integrating the informal economy'. By mapping and critically analysing the literature on policy research that has been undertaken to date, this review provides a platform for enhancing the integration and implementation of the diverse green economic policies in South Africa.

Keywords: systematic literature review, green economic policy analysis, green economy, ecological economics, South Africa

"This is not a book about doom and gloom. It is a book about hope. It's about how we can shift from an economy that's organized around domination and extraction to one that's rooted in reciprocity with the living world. But before we begin that journey, it's important that we grasp what is at stake. The ecological crisis happening around us is much more serious then we generally assume. It's not just one of two discrete issues, something that could be solved with a targeted intervention here and there, while everything else carries on as normal. What's happening is the breakdown of multiple interconnected systems – systems on which human beings are fundamentally dependent." (Jason Hickel, 2020a:3-4).

2.1 INTRODUCTION

To echo the sentiments of Dr Jason Hickel, this ecological crisis, which affects everyone, can certainly not be confronted by South Africa only when it is deemed convenient enough to do so. Whilst South Africa has made some progress towards acknowledging the monumental economic and ecological challenges that stand before us, this article has found that South Africa's green economic policies are not built upon an understanding that this crisis must be approached through the lens of "multiple interconnected systems". As is demonstrated in the literature review which follows, our fractured green economic policy response is indicative of that and will be further analysed throughout this article.

The climate crisis and its myriad dangers and unpredictability are upon humanity – indefinitely for the time being. Reputable climate science thus far has confirmed that

the combined suddenness and speed of climate change are changing the operating boundaries of planet Earth significantly, making the conditions for sustaining human life extremely challenging (IPCC, 2018). As a result of excessive, unrelenting human activity, spurred on by the dominant social paradigm, i.e. neoliberalism, increases in hazardous GHGs (such as carbon dioxide (CO_2), methane and nitrous oxide) have skyrocketed (Harvey, 2018; Murray, 2015). Consequently, the Earth is currently experiencing a 1.2 °C increase in planetary temperatures over those experienced during the first industrial revolution, which commenced in 1760 (Satgar *et al.,* 2018). Consequently, serious ecological tipping points are kicking in; the world is seeing the rapid melting of glaciers and the ice pack in the Arctic and Antarctic (releasing unconceivable amounts of methane – arguably the most deadly GHG), severe ocean acidification and rising sea levels (Satgar *et al.,* 2018).

As a result, an alarming increase in the occurrence of extreme climatic disasters has been recorded, which have impacts upon millions of people as well as their livelihoods every year (IPCC, 2014). Moreover, many fragile, life-sustaining ecosystems have been destroyed and substantial amounts of biological diversity have been lost; an estimated 50% of all animal species are extinct, and the number of remaining species are dwindling severely (Ceballos *et al.,* 2017). It is worth mentioning that these statistics are only a few of the recorded disastrous effects brought on by climate change; the likely repercussions (economically and environmentally) of a 1.5 °C total increase in global temperatures are both vast and severely underestimated, due to limited data on, and understanding of, the matter (IPCC, 2018). Furthermore, and most alarmingly so, a recent study (Raftery, Zimmer, Frierson, Startz & Liu, 2017) found that humanity has a mere 5% chance of keeping increases in global temperatures from exceeding 2 °C, which once more reiterates the true urgency of effective climate action.

Moreover, numerous scientific studies and evidence (see, for example, Davis-Reddy & Vincent, 2017; Conway, van Garderen, Deryng, Dorling, Krueger, Landman, Lankford, Lebek, Osborn, Ringler, Thurlow, Zhu & Dalin, 2015; Leichenko & O'Brien, 2002) point to African countries as being more severely impacted upon than most by the realities of climate change, which is attributable to high levels of vulnerability and very low adaptive capabilities. Although the continent contributes less than 5% of

global carbon emissions, it will suffer the worst repercussions in the continued absence of sufficient adaptation responses (African Union Commission, 2015). Additionally, Africa is considered to be the poorest region in the world; approximately 40% of Africans live on below USD1.90 a day (Donnenfeld, 2020). These added developmental challenges, coupled with the region's climate-vulnerability, will intensify the impacts of climate change and exacerbate existing inequality, immensely.

Southern African[3] countries, specifically, are even more vulnerable to climate variability than the rest of the continent and, like most African regions, are plagued by pronounced inequalities and extremely high poverty rates (UN, 2012). The region has become known for its highly variable rainfall, prolonged droughts and frequent flash floods (Spear, Haimbili, Angula, Baudoin, Hegga, Zaroug & Okeyo, 2015). Increasing occurrences of climatic shocks and disasters have recently left many Southern African countries in complete disarray; levels of high devastation are very challenging for low-income countries to recover from, as they are left with little resources, alongside an unconceivable amount of economic damage to repair. For example, the recent climatic disaster in Mozambique, Cyclone Idai, severely impacted upon the country's already struggling economy; infrastructure worth over one billion US dollars was destroyed and over one hundred thousand homes, alongside at least one million acres of crop fields, were completely devastated (Reid, 2019).

Within the Southern Africa region, the agriculture industry plays a major role in the livelihoods of approximately 75% of the population (World Bank, 2000). However, Southern Africa is one of the most drought-vulnerable regions in the world; 41% of worldwide drought disasters have been recorded in Africa (Centre for Research on the Epidemiology of Disasters (CRED), 2015). As water availability is fundamental to the success of crop yields, the impact of the continued exacerbation of the climate crisis will be consequential within the region (Dilley, 2000). Thus, in order to reduce vulnerability and increase resilience, drastic and extensive mitigation efforts, alongside robust adaptation action, are crucially important (Davis-Reddy & Vincent, 2017).

3 Southern Africa is defined here as the sixteen member countries comprising the Southern African Development Community (SADC).

The complex and trans-boundary nature of climate change thus requires coordinated, expansive regional cooperation and effective action within the Southern Africa region (Barnard, 2014). The mainstreaming of policy, legislation, strategies and regulatory frameworks geared towards climate change mitigation is therefore quintessential. Green economic policy, specifically, has a major part to play in both climate change mitigation and in meeting the development needs of people (Stafford & Faccer, 2014). The concept of the green economy is a point of departure for restructuring current developmental discourses that do not acknowledge the complex interlinked relationship between natural capital and economic development (Stafford & Faccer, 2014). The green economy is an imperative framework for all economic activity in the midst of the climate crisis. It brings effect to the concept of sustainable development, and requires coordinated, sweeping action and decisive commitment from governments, the private sector, and general society.

The aim of this article, therefore, is to analyse the prominent, defining literature that is informing the ways in which green economic policies are both formulated and implemented within South Africa. This is not only to assist in the vital task of mitigating the current climate crisis, but also to determine the lie of the land of the current state of South Africa's various green economic policies. Within this article, the standard United Nations Environment Programme (UNEP) (2011) criterion will be used to evaluate South Africa's green economic policy framework, i.e. one that promotes a low-carbon, resource-efficient and socially inclusive economy[4].

Thus far, however, despite the clear climate science reiterating the urgency of the matter, South Africa's green economic policies seem to be massively fragmented and isolated across various different disciplines and numerous institutions within the country (Parr, Swilling & Henry, 2018; Mauger & Barnard, 2018; Organisation for Economic Co-operation and Development (OECD), 2011a; Kotzé, Nel, du Plessis & Snyman, 2007). The challenge of attaining a coherent, all-encompassing understanding of South Africa's green economy policy sphere is therefore immense. Although many novel and comprehensive policy documents (i.e. the National Climate Change Response Policy (NCCRP) and the National Environmental Management Act (NEMA)) have been established in an attempt to reform the green economic

4 The green economy is a multifaceted concept, containing numerous discourses and vastly different ideologies. The conceptualization of this term will therefore be discussed in more depth within Section 2.3.2 of this article.

policy sphere, numerous of these have yet to come to fruition (Parr *et al.,* 2018; Centre for Environmental Management (CEM), 2004).

This article concedes that, in general, translating policy into action is quite a daunting undertaking, more so for a developing country such as South Africa; faced as it is with an overwhelming triple developmental challenge of unemployment, poverty and inequality (Montmasson-Clair, 2012; Spalding-Fecher, 2002). However, it is the argument of this article that a rigorous mapping, synthesis and analysis of the relevant literature is required to initiate some progress towards ensuring the proper integration and implementation of green economic policies within South Africa. Moreover, it is specifically essential to additionally assess and critique the literature that is influencing and determining the current green economic policies and frameworks within South Africa, in an attempt to analyse their effectiveness in transitioning the country into a state of enhanced sustainability. The success of green economic policies in the task of mitigating climate change largely stems from the actions that these policies propose, and thus, the literature that has brought about these proposed actions (DEA, 2014).

This article will conduct a systematic literature review that aims to deliver a cohesive synthesis of the literature surrounding South Africa's current green economic policies. Moreover, the systematic literature review will critically analyse the current qualitative and quantitative studies and findings pertaining to South Africa's green economic policies. A platform is needed for this review to inform policy and provide useful guidance to policymakers and stakeholders. This review will also contribute towards monitoring practitioners and evaluating existing green economic endeavours and programmes, assist in fostering sector-wide coordination, and identify research gaps and areas that require further investigation. Given the South African government's apparent current lack of urgency surrounding the climate crisis and radical climate change mitigation policy transformation, this article will endeavour to reiterate the importance of such measures being taken sooner rather than later. So far, within a South African context, no such comprehensive synthesis of this specific literature has been completed. Moreover, a critical engagement with this literature has, to our knowledge, not been conducted. This article will therefore be an important step towards providing a much-needed focus for this research agenda.

Based on the contextualization and explanation set out above, the research question for this article asks: “what is the state of green economic policies in South Africa?”

2.2 RESEARCH METHODOLOGY

Systematic literature reviews aim to provide rigorous and structured synthesized findings/summaries of research evidence, and the exact processes and steps taken in conducting the review are methodically outlined and specified (Stewart, 2014). Systematic reviews are typically used by decision-makers, in this instance, policymakers (Bryman, 2012). A systematic literature review is particularly useful for policymakers in the instance where vastly contradicting evidence/discourses in an area of research are present (Bryman, 2012). As this is the case with regard to South Africa’s green economic policies, a systematic review was deemed fitting. There are various approaches for conducting a systematic review, and this article will make use of the ‘narrative synthesis’ method. This particular method is deemed appropriate for reviews which aim to use mainly qualitative summaries (Barnett-Page & Thomas, 2009).

This article will thus be based entirely on qualitative research, using existing published secondary sources, i.e. green economic policy literature. A systematic literature review was chosen for this article, as it is a non-empirical approach that is in line with the non-empirical objectives of this study (Mouton, 2011). Moreover, this particular method was chosen as the research question of this article is intended neither to validate any specific relationship between various empirical variables nor to determine any instance of causality between these variables. Again, this research question seeks to ask, what is the state of green economic policies in South Africa? Thus, neither a quantitative nor a mixed-methods approach would meet the specific research objectives of this study. A qualitative analysis that a systematic literature review embodies was chosen as the most appropriate and insightful approach in answering the research question at hand, identifying the themes within the literature, and assisting in future research endeavours.

Furthermore, a systematic review was chosen, rather than the study of one influential piece of literature on green economic policy, as the latter generally offers a more narrow and restricted insight into the understanding of a specific problem. As

has been emphasized, the nature of the climate crisis is such that there are many interconnected systems at play, therefore calling for analysis that considers the complexities in the various green economic policies. As such, a systematic literature review is less likely to misrepresent the balance of research evidence and/or to highlight only one side of a pressing policy issue (Davies, 2015). A systematic literature review allows for the synthesis of knowledge in such a way that will reduce the influence of any particular errors that single studies are prone to (Yu & Magaya, 2017). Additionally, given the many systemic challenges that South Africa faces in policy implementation, alongside the fact that several studies (see Yu & Magaya, 2017; Bryman, 2012; Mallett, Hagen-Zanker, Slater & Duvendack, 2012) have reiterated the viability of systematic reviews in improving the general policymaking sphere, it seems only logical that the increased use of systematic reviews could assist South African policies to gain more rigour.

Moreover, a systematic literature review was deemed appropriate for this study, as opposed to a standard literature review (more commonly known as a traditional narrative review), primarily for two reasons. Firstly, a systematic literature review tends to suppress any particular biases and set notions that the researcher might be prone to, in an attempt to ensure that the research remains as thorough, transparent and reflective as possible (Bryman, 2012). This is done by adopting explicit, set procedures in the process of reviewing the literature, as opposed to a standard literature review which does not necessitate these predetermined procedures (Bryman, 2012; Teing, 2007). Secondly, a systematic review approach is deemed more appropriate and valuable for decision-makers, particularly policymakers (but this can include researchers, elected officials, and civil society), in that the approach is generally vastly more balanced and evidence-based than a traditional literature review is (Bryman, 2012). It is to be noted, however, when analysing literature as vast and differentiated as green economic policies, that some level of value judgement will invariably be present, even if it is mitigated by presenting various competing perspectives in the systemic review.

Additionally, this systematic literature review will not only encompass a general mapping and synthesis of the relevant literature, but will also critique the literature in its effectiveness for facilitating a green economy. Thus, this article will not overtly

claim complete neutrality, but will rather attest to a balanced approach in analysing the literature.

2.3 APPLICATION OF THE SYSTEMATIC LITERATURE REVIEW PROCESS

The five-phased methodological model as proposed by Vom Brocke, Simons, Niehaves, Plattfaut and Cleven (2009) was adopted for the literature search process. The model comprises the following phases (in chronological order): defining the scope of the review; conceptualizing the topic; conducting the literature search process; analysing, synthesizing the literature; and, lastly, identifying a new research agenda.

Below, each of the four steps involved in conducting the systematic literature review itself are outlined. In each step, the application to green economic policies in South Africa is then discussed in detail. Section 2.7 addresses the fifth and final step of the systematic literature review only after the critical analysis has been completed, as this analysis invariably is needed in order to identify a new research agenda.

2.3.1 Step 1: Defining the scope of the review

The first step entails explicitly stating the intention of the review in order to clearly define the focus of the review, determine the goal that the review intends to fulfil, and identify the audience whom the review aims to address (Bryman, 2012; Cooper, 1988). The main purpose of this article in undertaking a systematic literature review is to establish the current lie of the land regarding South Africa's progress in formulating, adopting and implementing green economic policy. The review will additionally critique the efficiency of the various identified policies and relevant influential literature in its ability to enable the policymaking sphere to initiate and sustain a transition towards a green economy within South Africa. The audience of this literature review are thus all stakeholders with an interest in the subject matter, e.g. policymakers, researchers (both in the public and private sphere) and civil society.

2.3.2 Step 2: Conceptualizing the topic

Within this step, both prominent and less prominent theories and definitions pertaining specifically to the study are conceptualized, and the topic at large must be sufficiently disaggregated, in that uninitiated readers may gain an enhanced insight into the particulars of the study (Zorn & Campbell, 2006; Torraco, 2005). In the systematic literature review of Article 1, these theories are already embedded in the analysis, but a more thorough discussion of these theories can be found below. This is to indicate the theoretical foundations that were drawn on in the iterative process of using a method to continuously inform the final systematic literature review.

2.3.2.1 The green economy

The concept of a green economy first emerged with Pearce, Markandya and Barbier's (1989) publication entitled *'Blueprint for a Green Economy'*. It was only after the 2009 financial crisis, however, that the concept of a green economy was posited as a radical but necessary global developmental practice (Georgeson, Maslin & Poessinouw, 2017). The green economy can be defined as a sustainable development path aiming to induce both an improvement in general human well-being and social equity, whilst minimizing environmental risks and ecological scarcities (Stafford & Faccer, 2014). Moreover, at the core of the conceptualization of the green economy lies the recognition that economic development and environmental policies cannot be two isolated concepts (Barbier, 2013).Within this article, the widely known UNEP (2011) definition will be used as a criterion to evaluate South Africa's green economic policies; i.e. policies that promote a low-carbon, resource-efficient and socially inclusive economy.

The green economy concept has since its discovery transformed into a much broader policy framework, particularly since the United Nations Conference on Sustainable Development (Rio+20) in 2012 where the importance of the concept in playing a more central role in international policy debates was recognized (Damon & Sterner, 2012). As it is such a broad, multifaceted concept, many different interpretations and ideologies span the green economic sphere. The following four discourses will be discussed below (there are undoubtedly many more relevant conceptualizations, but an exhaustive summary of these is outside the scope of this

article): ‘green revolution’, ‘green transformation’, ‘green growth’ and ‘green resilience’. Each of these four discourses has vastly different points of departure, and varied policy implications; thus, their disaggregation is of importance.

The ‘green revolution’ discourse is typically considered as being the first interpretation of the green economy (Death, 2014b). The concept first emerged in the 1940s, and was exceedingly popular amongst many environmentalists at the time, up until the late 1970s (Patel, 2013). This particular ‘branch’ of the green economy is certainly the most radical, as it advocates for an extensive, revolutionary transformation of the entire economic and political system, and within general society. This discourse infers that only in doing so, will humanity be able to prosper whilst coexisting with the Earth’s natural limits and ecological virtues. This discourse has also brought about various other drastic alternatives to the current economic trajectory, including de-growth, steady-state economics and prosperity without growth (see, for example, Hickel, 2019; Pilling, 2018; Clapp & Dauvergne, 2005). Within this theory, the shift from orthodox economic growth and similar contemporary trajectories is not only seen as a necessity, but as a progressive shift towards a more resilient, inclusive society (Barry, 2012).

The second manifestation of the green economy is that of a ‘green transformation’; this discourse places much emphasis on the achievement of sustainable development in order to realign current growth and development paradigms (World Commission on Environment and Development, 1987). This particular dialog maintains that the basic aspects and notions of the current global system, i.e. modern capitalism, is adequate in facilitating ‘green’ changes in economic, political and societal systems (Death, 2014b). Within this discourse, therefore, economic growth is deemed the overall driver of progress still, and the environment remains an exploitable commodity, primarily for the use of furthering human development. Invariably, there are linkages between this particular discourse and that of ‘green growth’. Death (2014b) clarifies the matter by distinguishing the ‘green transformation’ discourse as such; the issue of social and intergenerational justice, equity and redistribution is of particular importance within this theory, and economic growth is thus viewed as being merely a means rather than an end.

The third discourse is that of the popular concept – green growth. The main point of departure within this discourse is that, as a result of the inefficiency of the current economic system, opportunities in the form of green markets have arisen that should be capitalized upon (World Bank, 2012a). The idea of 'cleaner' growth thus emerged; growth that is not reduced or hindered in any form, but growth that essentially focuses on the new markets, services and consumption habits which emerged as a result of environmental concerns (Death, 2014b). Lastly, the fourth discourse, 'green resilience', is regarded the least radical of the various green economic discourses. The main essence behind this discourse is merely to keep to the current status quo, by means of putting cautionary and reactionary measures in place (Death, 2014b). These include climate adaptation schemes, disaster relief campaigns, resilient agricultural practices, and building independent local economies.

2.3.3 Step 3: Conducting the literature search process

Within this step, studies relevant to the scope and purpose of the review were gathered. The following search criteria were decided upon: the studies collected should be confined to pieces of literature that have been published or translated in English; only studies pertaining to South Africa should be included within the review, as this is line with the research question; and, lastly, the literature gathered should be limited to post-apartheid publications, i.e. 1994 and onwards. The literature has been confined to this specific timeline primarily for the reason that environmental policies adopted before 1994 were white-dominated and disregarded poor and dispossessed South Africans entirely (Hamann, Booth & O'Riordan, 2000). Moreover, the varieties of literature that were analysed were not only confined to purely academic works alone, but included reputable grey literature[5]. Grey literature can make vital contributions to a systematic review as it may provide valuable information not found within commercially published literature or academic research that is not behind paywalls (Adams, Hillier-Brown, Moore, Lake, Araujo-Soares, White & Summerbell, 2016). Grey literature, thus, reduces publication bias, increases a review's comprehensiveness, and ensures a more balanced picture of the available evidence (Paez, 2017). Furthermore, green economic policies as identified by the South African Department of Environmental Affairs (DEA) were used

5 Grey literature refers to publications that are not controlled by commercial publishing organizations. Examples of grey literature include reports, working papers, government documents, white papers and evaluations.

as an initial guideline within this article when it was being determined which policies to include/exclude within the review. As the major organization driving green economic policies in South Africa, this was a relevant starting point to begin the mapping of the most prominent policies.

The literature search was conducted through various electronic databases in collecting the relevant literature, for example the North-West University's online library, EBSCOhost, JSTOR, Juta, ResearchGate, Scopus, ScienceDirect, Sabinet Online, Sage Journals, Springerlink and Google Scholar. The following basic research terms were used for searching the title, abstract, key words and content of the literature: 'green economic policy', 'green growth policy', 'green policy', 'ecological policy' and 'environmental policy', combined with 'South Africa'. Additionally, the following terms were used in combination with the term 'South Africa' in order to refine the search process with regard to specific policy documents within South Africa: 'Integrated Resource Plan', 'New Growth Path', 'Industrial policy action plan', 'Green Economy Summit report', 'National Strategy for Sustainable Development and Action Plan', 'Consultative National Environmental Policy Process (CONNEPP)', 'Environment Conservation Act', 'National Environmental Management Act (NEMA)', 'National Climate Change Response Policy (NCCRP)', 'South African Draft Carbon Tax Bill (2016)', 'Green Economy Accord 2011', 'Energy Efficiency Accord 2005', 'Global Change Grand Challenge National Research Plan', 'National Framework for Green Building 2011', 'National Biofuels Industrial Strategy 2007', 'Climate Change Policy Framework for State Owned Companies', 'National Forests Act (Act 84 of 1998)', 'The White Paper on Renewable Energy (2003)', 'National Biogas Strategy' and 'Integrated Energy Plan 2010'.

The initial search and filtering process yielded 212 possible studies. After scrutinising the collected papers, and the exclusion of those that did not fit the inclusion criteria or were not policy-focused, a total of 42 studies remained. Some pieces of literature were excluded as these were not focused on South Africa specifically, but rather on the general Southern Africa area (sometimes referred to as SADC). The 42 studies that were found were then investigated, and after assessing these, additional articles were found arising from the original 42 studies, which then totalled up to 54. A full itemization of each of the 54 articles can be found in Appendix 1.

After an assessment of the various studies, some key themes emerged. As the identification of themes is considered to be one of the most essential aspects in qualitative research, a description is set out hereafter of the theme discovery methods this article made use of, and the themes themselves (Ryan & Bernard, 2003). The themes were identified by using an 'inductive approach'; themes are induced from the data, in this case the reviewed literature (Ryan & Bernard, 2003). Firstly, two major themes were identified, splitting the literature regarding the current state of South Africa's green economy into those that exude enthusiasm over South Africa's performance in transitioning to a green economy, and those that are apprehensive over South Africa's green economy policies.

Thereafter, the following three sub-themes were identified within the overall 'enthusiastic' theme (a table outlining these themes can be found in Table 2.1). The first sub-theme was 'comprehensive green economic policy framework', the second 'enables a transition to a low-carbon society' and the third 'promotes socioeconomic development'. Lastly, five sub-themes were identified within the major theme of the apprehensive literature. These sub-themes can be found in Table 2.2. The first sub-theme is 'policy incoherence', second 'policy implementation challenges', third 'continued commodification of nature', fourth 'socioeconomic dependency on "brown" economic development', and finally, 'lack of integration of the informal economy'. It should be noted, however, that the identified themes are not perfectly neat divisions; there are various interlinkages present between the various themes, but the overarching contribution of each of the pieces of literature analysed falls into the themes that have been mapped below.

2.3.4 Step 4: Analysing, synthesizing and critiquing the literature

2.3.4.1 Mapping the current state of South Africa's green economy

Vastly contradicting accounts have emerged over the past few years regarding the level and depth of South Africa's engagement with the green economy. To more clearly demonstrate some of the present tensions and contradictions regarding the status of South Africa's green economy, the relevant literature has been divided into two major themes. The first major theme will engage the literature that, for the most part, has analysed South Africa's performance in transitioning towards a green

economy in a relatively positive way. This first major theme that I have identified through the method of this systematic literature review is what I have titled 'the enthusiastic literature'. The second major theme I have identified in the literature argues that exceedingly little or varying progress has been made in progressing South Africa's green economy. I have titled this second major theme 'the apprehensive literature'.

2.4 FIRST MAJOR THEME: ENTHUSIASTIC LITERATURE RELATING TO SOUTH AFRICA'S TRANSITION TO A GREEN ECONOMY

Only 15 papers of the 54 pieces of literature analysed, on the whole, firmly asserted a positive outlook regarding the current trajectory of South Africa's transition towards a green economy. Although some of the reviewed enthusiastic studies conceded that a few issues remain regarding policy formulation and implementation, these concerns were nonetheless outweighed by the amount of sound, stringent green economic policies and legislative mechanisms these studies attest South Africa to possess. While these studies undoubtedly contain numerous arguments, the three sub-themes discussed below consistently emerged during the analysis of the enthusiastic literature.

Table 2.1: Themes identified within the enthusiastic literature

Major theme: "Enthusiastic" literature		
Sub-theme 1: Comprehensive green economic policy framework	Sub-theme 2: Enables a transition to a low-carbon society	Sub-theme 3: Promotes socioeconomic development

Source: Author's own framework

2.4.1 Sub-theme 1: Comprehensive green economic policy framework

In order to gain some degree of historical perspective to the advent of South Africa's current green economic regime, this section commences with one of the most dated studies analysed within this systematic review. Rabie's (1999) article points to the

South African government's noteworthy dedication at the time (shortly after the end of the apartheid era) to reform discriminatory, white-dominated environmental policies and practices. The environmental reform processes that followed in the late 1990s garnered much praise in the studies by Montmasson-Clair (2012), Earthlife Africa (2009) and Rabie (1999) as these exuded inclusivity, transparency and offered a generous scope for public participation. The reform processes eventually led to the formation of a consultative process now known as the Consultative National Environmental Policy Process (CONNEPP), which subsequently led to the publication of the National Environmental Management Act, 107 of 1998, (NEMA) – the first 'umbrella' piece of national environmental legislation (Bray, 1999; Rabie, 1999). The study by Bray (1999) found NEMA to be on par with international environmental standards at the time, and described NEMA as a transformative, landmark statute, promising to catapult the environmental affairs of South Africa into a state of enhanced clarity and rigour.

Since then, the impetus for action on climate change has increased significantly, and the establishment of numerous green economic policies and enterprises within the country have consequently soared, spearheaded by different role-players; i.e. the business community, various governmental departments, commissions and, in some instances, the Presidency itself. Additionally, the Partnership for Action on Green Economy (PAGE) (2017) found that all nine provinces and all key sectors in the South African economy are actively playing a role in the green economy, to varying extents. The studies by Rabie (1999), Odeku and Meyer (2010) and PAGE (2017), however, point to the South African government as being the main actor in proactively driving extensive climate change mitigation efforts.

The study conducted by PAGE (2017), identified an incredible 357[6] green economic initiatives within South Africa, and of these, a total of 32 were identified as enshrining environmental sustainability[7]. Additional studies (PAGE, 2017; Montmasson-Clair, 2012; Odeku & Meyer, 2010) attest not only to the sheer quantity[8] of green economic policies within the country, but also maintain their quality as well, describing South

6 Although the report initially identified a total of 667 green economy initiatives within South Africa, only 357 were earmarked for further analysis.

7 It is to be noted that, within the report, no further explanation is given as to which criteria these 32 initiatives met to be labelled as such particularly.

8 Although most of the reviewed studies within this section express only enthusiasm of the sheer number of green economic enterprises, PAGE (2017) and Montmasson-Clair (2012) ultimately concede that the large amount of green economic policy, frameworks, strategies and acts within the country makes navigating the policy sphere particularly challenging.

Africa as an African leader in terms of its climate mitigation and adaptation policies. The various papers analysed throughout this section typically base the quality of green economic policies on whether or not a policy promotes a truly green economy, making use of the popular UNEP (2011:1) definition of a green economy as one which is “low carbon, resource efficient, and socially inclusive”. Additionally, current green economic initiatives are frequently labelled as being ambitious, innovative, sufficiently practical and entirely implementable (PAGE, 2017; Montmasson-Clair, 2012; Odeku & Meyer, 2010).

2.4.2 Sub-theme 2: Enables a transition to a low-carbon society

South Africa, being the most industrialized country within Africa, emits the most GHGs on the continent, and ranks 14th amongst the world’s largest emitters of GHGs (Earthlife Africa, 2009). The country’s energy profile is dominated by the use of fossil fuel-based resources, predominantly coal (Odeku & Meyer, 2010). As such, climate mitigation and adaptation strategies within the country revolve mainly around the energy sector (Odeku & Meyer, 2010). As South Africa is party to numerous international obligations, such as the Kyoto Protocol and the 2015 United Nations Framework Convention on Climate Change (UNFCCC) (more commonly referred to as the Paris Agreement), the country has put in place sweeping policies and frameworks to reduce its GHG emissions (Montmasson-Clair, 2012). Due to the combined effect of the carbon tax and the extensive renewable energy programme inaugurated at the time, GHG emissions within the country were expected to gradually decline (Odeku & Meyer, 2010).

Some green economic policies, however, were singled out as being particularly well designed and pertinent in transitioning South Africa into a low-carbon economy. The 2011 Renewable Energy IPP Procurement Programme (REIPPPP) (a programme affiliated with the Integrated Resource Plan (IRP 2010-2030)), for example, was highlighted by the Department of Energy (DoE), National Treasury and the Development Bank of Southern Africa (DBSA) (2017), PAGE (2017), Nhamo and Mukonza (2016) and Eberhard, Kolker and Leigland (2014) as a widely successful green economy initiative, having had a significant impact on greening the energy

sector within the country[9]. The programme has garnered much attention locally and internationally, and investments received from the private sector amount to a considerable R201.8 billion (PAGE, 2017). Since the commencement of its first operational project, more than 16 991 GWh of renewable energy have been generated from over 150 projects (DoE, National Treasury & DBSA, 2017).

Moreover, the studies by Nhamo and Mukonza (2018; 2016) and Szewczuk (2012) reveal the success of numerous renewable energy initiatives that focus on the promotion of solar and wind energy specifically; aptly so, considering South Africa's abundance of these particular natural energy resources (Montmasson-Clair, 2012; Never, 2011). Alongside the IRP, the Integrated Energy Plan, the National Energy Act and the White Paper on Renewable Energy are commended specifically in deploying wind and solar energy initiatives (Nhamo & Mukonza, 2018). The Solar Water Heating Programme (SWHP), Solar Atlas, Solar Park, the solar energy technology roadmap, South African Wind Energy Technology Programme (SAWEP) and the establishment of 22 fully operational onshore wind farms with an energy capacity of 1 876.6 MW are some of the most successful outcomes of these policies (Nhamo & Mukonza, 2018; 2016; Szewczuk, 2012).

As at 2015 (the newest available data made publically available), 4.4 million tonnes of CO_2 has been saved and the wind energy sector produced a net savings of R1.8 Billion since the integration of renewable energy in South Africa (Nhamo & Mukonza, 2018). Moreover, significant progress has been recorded regarding the Industrial Policy Action Plan's (IPAP) renewable energy objectives; around 200 000 solar water heaters (SWHs) had been installed by mid-2012 and a procurement process was initiated for approximately R120 billion's worth of large-scale renewable electricity generation (Montmasson-Clair, 2012). As a result of these policy successes, South Africa is considered to be a leading industrial country with regard to its energy-related policies, and has one of the fastest growing renewable energy markets internationally (PAGE, 2017; Odeku & Meyer, 2010).

As such, most of the studies analysed within this section maintained that South Africa's current green economic approach will most likely result in a substantial decrease in CO_2 emissions, as South Africa's focus has been largely on climate

9 However, PAGE (2017) acknowledged that details surrounding the various projects' target dates, financial matters and reporting and measuring systems were fairly lacking.

change mitigation[10] policy development (Nhamo, 2013; Never, 2011; Devarajan, Go, Robinson & Thierfelder, 2009). As most climate scientists reiterate the importance of climate change mitigation being the main priority of any climate policy, South Africa's green economic trajectory is considered to be heading in the right direction (Dessai & van der Sluijs, 2007). Odeku and Meyer (2010) specifically highlighted and commended two prominent policy documents that exclusively encompass clear climate change mitigation objectives: the 2004 National Climate Change Strategy (NCCS) and the 2008 Long Term Mitigation Scenario (LTMS). Both the LTMS and the NCCS was hailed as placing South Africa at the forefront in global climate change negotiations, as climate change strategies were remarkably rare among developing countries at the time (Earthlife Africa, 2009). Unsurprisingly, other studies point to the recently implemented carbon tax and carbon emissions trading schemes (cap-and-trade programmes) as being the most important mitigation instruments within the country (World Bank, 2016a; Van Heerden, Gerlagh, Blignaut, Horridge, Hess, Mabugu & Mabugu, 2006). An empirical study by the World Bank (2016a) also indicated that the carbon tax would result in an estimated 26–33% reduction of GHG emissions by 2035, compared with business-as-usual levels.

According to Montmasson-Clair (2012), more evident progress of South Africa's transition to a green economy can be seen within the following specific sectors: waste management, biodiversity, water conservation and demand management, and public transport. The study by Baloyi and Masinga (2010) analyses the waste management sector specifically, and refers to the latest 2009 Waste Act as being a landmark piece of legislation that will ensure healthier communities and a cleaner environment. Within the public transport sector specifically, the commitment to green transport systems has clearly been articulated through the rollout of the Bus Rapid Transit (BRT) system and the Gauteng mass rapid transit railway and bus system (Gautrain). The BRT system has, however, received the most funding within the sector; thus, impressive, large-scale transport planning at national and municipal levels has since been initiated (PAGE, 2017). Other pivotal examples of what can be achieved through an expansive and enabling green economic policy framework is the notable establishment of the Green Fund in 2012, being a pertinent catalyst of

10 Climate change *mitigation* policies are more frequently developed within the country as opposed to climate change *adaptation* policies; a pertinent aspect of climate policy nonetheless. Climate change adaptation is generally more reactive and is typically only initiated by the negative consequences of climate change (for example climatic disasters, food shortages, water shortages, and health concerns and challenges).

South Africa's green economic transition (PAGE, 2017; African Centre for a Green Economy (AFRICEGE), 2015). Since its launch, the Green Fund has allocated R1.1 Billion towards a total of 55 green economic ventures (PAGE, 2017).

2.4.3 Sub-theme 3: Promotes socioeconomic development

While South Africa is classified as a middle-income country, it is still a developing country, facing some of the worst socioeconomic development constraints, globally (Rodseth *et al.,* 2020). This has been ingrained by decades' worth of colonialism and institutionalized discrimination. With an unemployment rate of 42.0%[11], extremely high rates of chronic poverty, and possessing the world's highest Gini Coefficient (0.63) and Palma Ratio (10.13), it is imperative that the transition to a green economy must foster human development (Stats SA, 2020; World Bank, 2019c; World Bank, 2018b). The studies by Montmasson-Clair (2012) and Borel-Saladin and Turok (2013b) maintain that several of South Africa's green economic policies will succeed to this end, as these promote growth and have great job creation potential. For example, the study by Maia, Giordano, Kelder, Bardien, Bodibe, du Plooy, Jafta, Jarvis, Kruger-Cloete, Kuhn, Lepelle, Makaulule, Mosoma, Neoh, Netshitomboni, Ngozo and Swanepoel (2011) surmised that the green economy has the potential for providing a total net employment of 98 000 jobs in the short run (i.e. two years), and 462 567 jobs in the long term (i.e. the next 8 years).

Specifically, the 2010 New Growth Path (NGP) was singled out as possessing the most notable green economic initiatives that could assist in furthering economic development (Montmasson-Clair, 2012). As an outcome of the NGP, the 2011 Green Economy Accord was inaugurated, mainly aiming to create 300 000 jobs in the green economic sector (Borel-Saladin & Turok, 2013b). This ambitious goal is substantiated by Montmasson-Clair (2012) and the study further asserts that this amount might well exceed 400 000 in the future. The study by AFRICEGE (2015), on the other hand, found the National Development Plan (NDP) to be the most pivotal policy document in prioritizing and catalysing green socioeconomic development within South Africa, alongside its accompanying strategy, the National Strategy for Sustainable Development (NSSD).

11 The expanded unemployment rate is currently at 42.0%, whereas the official unemployment rate places the country at 29.1%. For a detailed justification regarding the preferred use of the expanded rate, rather than the official (narrow) rate, see Alenda-Demoutiez and Mügge (2019).

Additionally, the 2010 and 2011 iterations of the IPAP were also distinguished for prioritizing green industries and energy-saving industries within its job creation endeavours (Montmasson-Clair, 2012). The 2010 Integrated Resource Plan (IRP) was also identified as prioritizing job creation and improving skills in renewable energy technologies by providing training and awareness in the field (PAGE, 2017). Furthermore, PAGE (2017), alongside the Green Economy Coalition (GEC) (2018), noted South Africa's impressive public employment programmes which aim to create 'green jobs'; 13% (approximately 1 million jobs from 2004 up until 2017) of all the jobs created by the Expanded Public Work Programme (EPWP) are environmentally related (PAGE, 2017). The Working for Water, Working for Wetlands and Working for Forestry programmes form part of the EPWP's envisaged role in facilitating a just, low-carbon and climate-resilient South Africa. However, it is to be noted that these jobs are low paying and of low quality, requiring workers that have minimum skills and offering very little in the way of job security (GEC, 2018).

2.4.4 Enthusiastic literature: Concluding remarks

Although some pressing concerns regarding policy implementation arose within some of the analysed items of literature (Borel-Saladin & Turok, 2013b; Rabie, 1999), especially regarding policies that seem more drastic and far-reaching, it was nonetheless concluded that the success of environmental management depends by and large on sound, stringent policies and legislation, and these studies attest that South Africa has a multitude of these. Indeed, a number of the analysed studies (PAGE, 2017; Nhamo & Mukonza, 2016; Odeku & Meyer, 2010) assert South Africa's key influential role in catalysing the sustainable development agenda and green economic policy development within the African continent, and boldly maintain that this developing country is a global leader in the fight against the climate crisis.

2.5 SECOND MAJOR THEME: APPREHENSIVE LITERATURE RELATING TO SOUTH AFRICA'S TRANSITION TO A GREEN ECONOMY

In many respects, South Africa is considered by the literature in this section to be a poor candidate to be leading a transition to a green economy. The country's economy is characterized by being heavily dependent on coal and mineral extraction industries, inordinate levels of per capita CO_2 emissions have been recorded,

considering the low level of development, and widespread inequality still persists (Rennkamp, 2019; Death, 2014b). Thus, by every criterion of the standard UNEP (2011) definition of a green economy (one that is low-carbon, resource efficient and socially inclusive), South Africa has a long way to go (Death, 2014b). However, it is to be noted that a general consensus regarding the exact criteria for a green economy have not been settled, given the plethora of different studies that have assessed various different green economy definitions, typologies and discourses (see, for example, Georgeson *et al.,* 2017; Death, 2015; Brown, Cloke, Gent, Johnson & Hill, 2014; Borel-Saladin & Turok, 2013a; Bina & La Camera, 2011).

According to the most recent OECD (2017) green growth indicator status report, South Africa ranks amongst the bottom five of 46 countries analysed in terms of its green growth status, and is one of the countries that showed the least overall improvement in progressing towards green growth. Similarly, on the Global Green Economy Index (GGEI), South Africa is positioned at a lowly 91st out of a total of 130 countries (Dual Citizen, 2018). The literature that follows paints the same bleak picture that these statistics do, and point to the various failures of – and challenges faced by – the current green economic policies and frameworks in South Africa. Of the 54 pieces of literature analysed, 39 maintained an exceedingly apprehensive view, and the following five sub-themes described below persistently emerged whilst reviewing the literature.

Table 2.2: Themes identified within the apprehensive literature

Major theme: Apprehensive literature				
Sub-theme 1: Policy incoherence	Sub-theme 2: Policy implementation challenges	Sub-theme 3: Continued commodification of nature	Sub-theme 4: Socioeconomic dependency on 'brown' economic development	Sub-theme 5: Lack of integration of the informal economy

Source: Author's own framework

2.5.1 Sub-theme 1: Policy incoherence

Although a large variety of policy, frameworks and strategies have been amassed in the past two decades and many international pledges have been ratified, South Africa's current pathway of establishing and ensuring a green economy is severely hindered. Certainly, a hindrance in the way of a lack of sound, progressive green economic initiatives is not present within the country; the studies by Averchenkova, Gannon and Curran (2019), Kotzé *et al.* (2007), and Kotzé (2006) concede that, among developing countries, South Africa's green economic framework is one of the most elaborate and groundbreaking. Indeed, the 2018 Green Economy Barometer report states that South Africa has robust policy foundations which have the possibility for shaping a truly prosperous green economy (GEC, 2018). The same report, however, goes on to rate South Africa's green economy progress as a mere five out of ten (GEC, 2018).

The studies by Averchenkova *et al.* (2019), Never (2011), and Kotzé (2006) ascribe South Africa's poor green economic progress mainly to a lack of policy coherence and alignment[12], which is a major systemic issue that prevails within the country, despite over two decades' worth of rigorous policy evolution. Essentially, green economic objectives and the broad developmental goals set out in other pertinent policy documents are not consistently aligned, and are often even in tension with one another (Averchenkova *et al.,* 2019; DEA, 2015). The lack of policy cohesion within the country has resulted in an extremely complex policy landscape, and because of the lack of a concise hierarchy, it is difficult to determine which policies take precedence (Averchenkova *et al.,* 2019; DEA, 2015).

Several studies found that sectoral objectives specifically relating to socioeconomic challenges are more often than not innately prioritized, rather than streamlined in conjunction with green economic policies (Cloete, 2018; DEA, 2015; Giordano, 2014; Faling, Tempelhoff & van Niekerk, 2012). Indeed, the studies by Kalumba, Olwoch, Van Aardt, Botai and Rautenbach (2017) and the DEA (2015) found the priority focus of all three tiers of government to be mainly on economic growth and job creation, with green economic policy often regarded as an added constraint to development initiatives. Mauger and Barnard (2018), GEC (2018), Giordano (2014), and Never

12 This is sometimes referred to as legal/legislative fragmentation.

(2011), therefore, unsurprisingly found that the integration of green economic policy objectives only occurs superficially within other development endeavours, such as public infrastructure and renewable energy programmes.

The study by Giordano (2014) attributes the occurrence of policy incoherence mainly to the fact that the green economy is still predominantly viewed as a sector, and not a cross-cutting opportunity for all economic and social development strategies. As the success of green economic outcomes depends on the unification of economic, social and environmental developmental programmes, policy coherence and consistency is imperative to avoid policy conflicts and contradictions (Cloete, 2018).

Another major attributing factor adversely affecting South Africa's green economic policy coherence is the issue of institutional fragmentation. The mapped literature that follows examines this issue more closely, as various studies within this sub-theme articulate that South Africa's poor green economic performance is unmistakeably due to the nature of the institutional structures manning these operations, which are labelled as being fundamentally disjointed and unable to efficiently coordinate and unify the various novel commitments undertaken thus far (Mauger & Barnard, 2018; Giordano, Hall, Gilder & Parramon, 2011; Kotzé *et al.,* 2007; Kotzé, 2006). Institutional fragmentation or structural fragmentation[13] are frequently mentioned terms within these studies, and refer to the disjointed, complex institutional arrangements and interconnections between the three tiers of government (national, provincial and local) and the various departments existing within these tiers (Kotzé, 2006).

As a result of the complicated maze of institutions within South Africa that mandates and governs different functions of numerous diverse green economic initiatives, environmental governance efforts are not streamlined or aligned (Kalumba *et al.,* 2017; Klausbruckner, Annegarn, Henneman & Rafaj, 2016; Fakir, 1997). This is seen by Kotzé *et al.* (2007) and Kotzé (2006) as the overarching cause of South Africa's inability to translate green economic rhetoric into effective implementation. Kotzé *et al.* (2007), Kotzé (2006), and Fakir (1997) ascribe the fragmentation of the various institutions involved in green economic policy to South Africa's colonial and apartheid past. Due to decades of colonialization, South Africa replicated the

13 Not to be confused with legal/legislative fragmentation (i.e. policy incoherence).

governmental and judicial structures of its former European colonizers, which resulted in a large gap emerging between formal processes and actual practices (Kotzé *et al.,* 2007; Kotzé, 2006).

Averchenkova *et al.* (2019), Chandrashekeran, Morgan, Coetzee and Christoff (2017), Giordano *et al.* (2011) and Kotzé (2006) highlight the two most prominent occurrences of institutional fragmentation within South Africa as vertical fragmentation (fragmentation amongst the different spheres of government) and horizontal fragmentation (fragmentation within and across the different departments). Horizontal fragmentation, however, is identified by Mauger and Barnard (2018), Nhamo (2013), and Giordano *et al.* (2011) as being a particularly challenging manifestation of fragmentation within the country. Of the 32 sectoral departments, 21 are concerned with climate change, although none of these departments, apart from the DEA, view climate change as a priority within their sector, not to mention their most important priority (Giordano *et al.,* 2011).

Moreover, although the DEA is considered to be the custodian for climate change policy (Nhamo, 2013; Giordano *et al.,* 2011; Never, 2011), the study by Kotzé (2006) maintains that a centralized, coordinating mechanism is still lacking within the country. Instead of assuming a catalysing role in steering, planning and coordinating all environmental issues, the DEA has taken on a facilitating position, mostly providing green economic framework guidance[14] (Averchenkova *et al.,* 2019; Klausbruckner *et al.,* 2016; Kotzé, 2006). Additionally, because of the junior status of the DEA, and an accompanying small budget allocation, senior departments that are led by influential officials often eclipse the important role of the DEA (Cloete, 2018). The following departments were identified by Trollip and Boulle (2017), Nhamo (2013), and Never (2011) as taking charge over certain environmental responsibilities: the National Treasury, DoE, Department of Economic Development (EDD), the Industrial Development Corporation (IDC) under the Department of Trade and Industry (DTI), the Department of Science and Technology (DST), the National Planning Commission, and the DBSA.

14 The study by Nhamo (2013) has a slightly contrary view, however, maintaining that the DEA has the widest institutional and individual capacity, alongside a full branch comprising five chief directorates committed to addressing climate change and air quality.

The identification of so many departments is not surprising, due to the cross-cutting nature of both climate change, and climate change mitigation and adaptation strategies. Therefore, the success of green economic policy relies on its integration within many government departments, facilitated by all three tiers of government, across the entire administration as a whole (Covary & Averesch 2013; Giordano *et al.,* 2011). Notwithstanding this, the efficient coalition of these departments is severely hampered because of the lack of a lead agency, designating clear and appropriate institutional mandates and different departmental priorities (Polycarp, Brown & Fu-Bertaux, 2013; Nhamo & Bimha, 2011; Nhamo & Ho, 2011, cited in Nhamo, 2013).

Specific examples of the lack of interdepartmental coordination can be seen within the studies by Rennkamp (2019), Never (2011), and Gilder (2012). The study by Never (2011) specifically notes the strained and disjointed relationship between the DEA and the DoE, highlighting the unequal power relations between the two, mostly due to the monopolistic position of the DoE. The study by Gilder (2012), in the context of carbon taxation and emissions trading, points to the fact that the authority of the National Treasury supersedes that of the DEA when dealing with environmental fiscal reform matters (see also Montmasson-Clair, 2012; Never, 2011). Whilst this hierarchy seems only logical, Gilder (2012) maintains that, because of the vastly different views held by the National Treasury and the DEA regarding the main purpose of these green financial instruments, little clarity remains on pertinent issues such as the application/earmarking of the tax revenue.

2.5.2 Sub-theme 2: Policy implementation challenges

Although the awareness of green economic policy and strategic frameworks is present in national, provincial and local government spheres, implementation within the country has been negligible, thus far. The recent policy gap analysis by the DEA (2014) analysed 56 policy documents in the following five key sectors within the National Climate Change Response Policy (NCCRP): Agriculture, forestry and other land use (AFOLU); Energy; Industry; Transport; and Waste. The analysis only found four relevant implementation plans and two regulations across the five sectors that contain green economic elements (DEA, 2014).

The studies by Moyo (2015) and Hamann *et al.* (2000) found the main hindrance to sufficient implementation to be related to administrative capacity constraints. A lack of staff, technical skills and climate-change knowledge, coupled with a shortage of financial resources to comprehensively fund green economic endeavours, was identified as the most pertinent implementation constraint (Moyo, 2015; Faling *et al.,* 2012; Hamann *et al.,* 2000). Other studies concluded, however, that green economic policy implementation challenges encompass both technical and political elements (Rennkamp, 2019; Trollip & Boulle, 2017). Political challenges relate to lock-in mechanisms[15] (for example, South Africa's MEC), path-dependencies[16] and the vital role the vested interests of important stakeholders (bureaucrats, committees and other interest groups) have in hampering policy implementation, especially when it comes to policies relating to the restructuring of the minerals–energy complex (MEC) (Rennkamp, 2019; Musango, Swilling & Wakeford, 2016; Giordano *et al.,* 2011; Never, 2011).

Other studies (Iroegbu, Sadiku, Ray & Hamam, 2020; Chandrashekeran *et al.,* 2017) maintain that some green economic policies are flawed in themselves, as most lack strong enforcement and compliance dimensions. Green economic policies and regulations, although developed with novel intentions, will remain futile and insignificant, unless accompanied by effective means of enforcement and compliance (Iroegbu *et al.,* 2020). Additionally, in some instances where green economic ventures are in fact implemented, these only occur due to persisting institutional struggles within the country, rather than a move to fulfil environmental objectives (Rennkamp, 2019; Chandrashekeran *et al.*, 2017). As an example of these persistent institutional struggles, the introduction of the REIPPPP was driven mostly by the on-going electricity supply crisis South Africa faces. Although its implementation will decentralize fossil fuel-intensive energy enterprises, the required mind-set or philosophy of sustainable development, which is pertinent to the success of a green economic transition, is clearly missing (Chandrashekeran *et al.*, 2017). In

15 Although there are many manifestations of lock-in mechanisms, and therefore different definitions, the most typical refers to reinforcing mechanisms (corporate capitalism, old technologies) that 'lock-in' determined pathways of economic, technological, industrial and institutional development, eventually leading to path-dependency. As such, it becomes difficult for new, radical pathways to be established (such as the green economic development trajectory) (Klitkou, Bolwig, Hansen & Wessberg, 2015).

16 Path dependency and lock-in mechanisms are two very interrelated concepts, as path dependencies almost always occur as a result of lock-in mechanisms. Path dependency refers to the impact that past events/discourses or self-reinforcing processes have on driving the development of different pathways (economic, technological etc.) (Sydow, Windeler, Müller-Seitz & Lange, 2012).

such instances, it is clear that the promotion of a form of sustainable development that challenges the current structure of South Africa's unsustainable developmental paradigm is unlikely.

The study by Tyler and Gunfaus (2015) ascribes South Africa's green economic policy implementation 'deficit' more specifically to a particular strategy – the LTMS process. This green economic strategy was to assume the role of being the country's agenda-setting policy initiative; instead, the LTMS process has proven to be a major implementation barrier (Tyler & Gunfaus, 2015). The study by Trollip and Boulle (2017), on the other hand, found that the National Climate Change Response White Paper (NCCRWP) constitutes the most technical implementation challenges. This was found to be the result of a host of incomplete, complex policies within the NCCRWP, which do not adequately grasp vital policy linkages and dependencies.

Some studies focused on earlier policy developments (such the 1998 NEMA framework policy) and concluded that South Africa's environmental policy process has been riddled with implementation challenges from the outset (Rossouw & Wiseman, 2004; Hamann *et al.,* 2000). At a pivotal stage for green economic policy development, the succinct and logical sequencing of implementation action was overlooked, and as such, strategic action has been delayed from early on (Rossouw & Wiseman, 2004). Trollip and Boulle (2017) reiterate this view and found that green economic policies within South Africa are often developed and adopted before the policies they depend on are able to facilitate implementation.

Other studies found that the green economic agenda within South Africa remains that of pure conjecture and rhetoric, maintaining that the commitment to the green economy in all three spheres of government is shallow and disjointed (Chandrashekeran *et al.*, 2017; Death, 2014b; Faling *et al.,* 2012). Although the South African government has been vocal and proactive in international fora regarding its dedication towards a green economy, the national sphere lacks a definitive long-term strategy that will ratify these international commitments domestically (Chandrashekeran *et al.,* 2017). As such, the implementation of green economic policies within the country will continue to be negligible. This issue will be engaged with in more depth within Section 2.6 of this article.

2.5.3 Sub-theme 3: Continued commodification of nature

In Death's (2014b) study, four main discourses of the green economy were identified within South Africa, those being 'green growth', 'green resilience', 'green transformation', and 'green revolution', promulgated by different actors to varying extents. Death's (2014b) study, alongside that of Chandrashekeran *et al.* (2017), however, concluded that the predominant notion of the green economy within South Africa is that of green growth, as most green economic ventures entail the establishment of new markets, services and consumption habits. Death (2014b) and Chandrashekeran *et al.* (2017) maintain that it is primarily for this reason that the country has been able to place itself as an influential leader on the global green agenda; internationally, the green growth concept has certainly proven to be the most popular. Its current manifestation within the country, however, is cautioned against by Death (2014b) and Cock (2014), as many concerns and contradictions are present within this particular green economy discourse, which will especially be exacerbated within a developing, highly unequal country such as South Africa. Several proposed, and since adopted, green growth policy actions will have dire environmental and political repercussions. This will become even more problematic, should these policy actions be even more determinately pursued (Death, 2014b).

A major premise that green growth theory relies on is the continued exploitation and commodification of nature, and the pricing of environmental externalities (Death, 2014b; Cock, 2014). Given the influence of questionable, self-serving neoliberal imperatives in dictating the state of financial markets, great concern ought to be given to the discourse that green growth theory perpetuates regarding the financialization of the very ecosystems that sustain humanity (Leonard, 2018; Death, 2014b). The green growth discourse has also been criticized as being merely another form of economic growth; a concept which has continuously failed to dispel the high accounts of poverty and inequality within South Africa, and in fact, often perpetuates further socioeconomic problems (Chandrashekeran *et al.*, 2017; Death, 2014a; Death, 2014b; Cock, 2014).

As green growth is centred on the expansion of markets and the formulation of new technologies, the imperatives of profit will be continuously and innately prioritized, only further exacerbating social and environmental injustices (Leonard, 2018; Foster,

2000). Thus, climate change within this theory is predominantly viewed as an occurrence that brings about new prospects for economic activity that were not previously pursued. Chandrashekeran *et al.* (2017) and Cock (2014) maintain that such a green discourse is exceedingly problematic, as it does not allow South African policymakers to grasp the urgency of the climate crisis and pursue a different developmental path that is more aligned with environmental objectives. As such, existing power structures (for example, dominant approaches to political authority and capital accumulation, i.e. the minerals–energy complex) and neo-liberal thinking within the South African government remains unaltered; hence, the radical restructuring of the economy is unattainable (Chandrashekeran *et al.,* 2017). Additionally, within a neo-liberal green growth developmental trajectory, civil society remains largely excluded from participating in the narrative, and as such, green growth will not foster greater equality (Leonard, 2018; Musango *et al.,* 2016).

2.5.4 Sub-theme 4: Over-dependency on 'brown'[17] development

It has been well documented that the South African economy is carbon-centric and over-dependent on fossil fuel-based energy and transport systems (the largest and second largest sectors in terms of GHG emissions) (GEC, 2018). Coal-fired power plants account for 90% of all electricity generation within South Africa, and the country's CO_2 rate is 43% higher than the global average (GEC, 2018; Earthlife Africa, 2009). Although South Africa made a high-profile commitment to reduce its national emissions to 34% below 'business as usual' levels by 2020 and 42% by 2025, fossil fuel subsidies and investments have not stalled (Death, 2014b). Moreover, the state strongly supports new coal-fired power plants (for example, the Medupi and Kusile power stations) and the public financing for coal mining continues as well as the price regulation for liquid fuels (Burton, Marquard & McCall, 2019; Death, 2014b).

The development of alternatives to carbon-intensive energy production has been underway for several decades now, but this has had little impact on restructuring the current MEC. Even though the REIPPPP initiative is commended as being a successful green economic venture, the energy capacity that has since emerged

17 'Brown' development refers to development that is mostly dependent on polluting, carbon-intensive activities, such as fossil-fuel industries.

from the enterprise accounts for a mere 2.9% of the country's electricity supply (Baker, 2017; Eberhard *et al.,* 2014). The resistance of state-owned Eskom (a monopolistic and disproportionately powerful state-owned company accounting for the bulk of South Africa's emissions) to South Africa's renewable energy industry presents a major challenge to the green economic transition within the country (Leigland & Eberhard, 2018; Baker, 2017; Earthlife Africa, 2009).

Additionally, South Africa faces a number of socioeconomic challenges in transitioning towards a low-carbon green economy, pertaining specifically to that of potential increases in poverty and unemployment in the sectors that are carbon-intensive (Kaggwa, Mutanga, Nhamo & Simelane, 2013). The development of the proper skills and infrastructure that can sufficiently support the green economic transition is pertinent for a successful, inclusive green economy; however, little mention of how such developments will be prioritized is given throughout South Africa's green economic policy framework.

2.5.5 Sub-theme 5: Lack of integrating the informal economy

Another prominent issue within South Africa's green economic policy framework is the lack of effective measures to address the concerns of the informal sector, whilst simultaneously greening the economy (GEC, 2018; Smit & Musango, 2015a; Smit & Musango, 2015b). A key component of the green economy pertains to that of facilitating social inclusiveness; in the case of South Africa, integrating environmental concerns alongside inequality and poverty eradication requires the engagement of the informal sector (Smit & Musango, 2015a; Smit & Musango, 2015b; UNEP, 2011). The exclusion of the informal economy has led to a green economy that has a very narrow conceptualization of the lived realities of most South Africans; thus, further impeding social equity within the country (Smit & Musango, 2015a; GEC, 2018). As the green economy presents great prospects for both sustainable development and poverty eradication, the South African government has squandered a valuable opportunity to intersperse these two critically urgent issues (Smit & Musango, 2015a).

The study by Smit and Musango (2015a) analysed fourteen high-ranking policy documents that relate to the green economy, and found only one document, the NDP, to have sufficiently incorporated and engaged with the informal economy. As

such, Smit and Musango (2015a) concluded that the informal economy is not recognized to be a valuable component within green economic ventures, despite the pertinent role the informal sector has played insofar in greening the economy (see, for example, Godfrey & Oelofse, 2017). The following informal activities were identified as the most notable in facilitating a green economy: subsistence farming, bio-processing, management and trade, waste picking and recycling, waste-to-compost activities, the innovative use of renewable energy, and lastly, rainwater harvesting (Smit & Musango, 2015a). Waste management was specifically identified by Godfrey and Oelofse (2017), Godfrey, Muswema, Strydom, Mamafa and Mapako (2017), and Godfrey, Vozza and Mohamed (2016) as a particularly pertinent sector for facilitating informal green activities (the recovery, reuse and recycling of waste in particular). However, the informal waste sector has not received the necessary acknowledgement and financial support from the South African government.

In addition to providing much-needed green socioeconomic opportunities, the informal economy plays an imperative role in restructuring corporate capitalism perpetuated by modern globalization. This is a crucial task, indeed, if the transition to an alternative economic model, i.e. the green economy, is to be successful within the country (Smit & Musango, 2015b; Dawa & Kinyanjui, 2012; Smith, Stenning, Rochovska & Swiatek, 2008). The informal economy contains many different economic and social dimensions alongside important sociocultural dynamics, which ensures the perseverance and empowerment of cultural identity and employment (Dawa & Kinyanjui, 2012). Therefore, policymaking within this sphere requires a radical rethinking of standardized protocol, which in turn creates a more open and enabling policy environment, being one that will be able to facilitate structural economic change (Smit & Musango, 2015b). Additionally, as the informal economy consists of a mass of disenfranchized individuals, who are amongst the most vulnerable to the effects of climate change, much can be gained from observing the alternatives solutions that the informal economy engages with to better mitigate the climate crisis (Dawa & Kinyanjui, 2012).

2.6 CRITICAL ANALYSIS OF THE LITERATURE

2.6.1 Critical analysis of the enthusiastic literature

Whilst mapping the enthusiastic pieces of literature, a recurrent theme emerged, which somewhat questions the merit of some of these enthusiastic conjectures. The projected 'nation branding' of South Africa as an international leader in sustainable development tend to be the main underpinning of most of these studies' grand claims. For example, South Africa has played host to various prominent environmental conferences (for example the 2011 Durban COP17 Climate Change Conference, the 2010 Green Economy Summit, the 2002 Johannesburg World Summit on Sustainable Development). Moreover, the country possesses a rich natural environment that is protected by many conservation efforts, thus allowing it to be labelled as the economic and political 'gateway to Africa'. In consequence, South Africa has garnered the status of being a global leader on the green economy, despite achieving very little substantial green economic progress, to date (Averchenkova *et al.,* 2019; Chandrashekeran *et al.,* 2017; Death, 2014b).

Moreover, it is evident within the enthusiastic literature that some attention-grabbing pronouncements and rhetoric have become the dominant indicators of the so-called 'greenness' of South Africa's economy. The most common of these pronouncements include (but are certainly not limited to) the Green Economy Accord, the LTMS, South Africa's voluntary ratification to the Paris Agreement, the 2012 Gaborone Declaration for Sustainability in Africa, and the adoption of the 2030 Agenda on Sustainable Development. Whilst the proclamation of South Africa's willingness to undertake these initiatives has certainly attracted a great deal of national and international interest, much of these have simply been branded as political propaganda, having elicited high-profile, yet only temporary, commitments from top politicians (Averchenkova *et al.,* 2019; Death, 2014b). The Green Economy Accord of 2011, a pioneering initiative to create 300 000 green jobs by 2020, for example, has had very little impact on facilitating a green economic transition, yet it remains often cited within many of the reviewed enthusiastic studies as an important and noteworthy undertaking of the South African government towards a green economy (GEC, 2018).

Moreover, when it comes to discourse relating to that of translating policy into action, most of the enthusiastic pieces of literature was found to be vague, at their best. A telling indication of this can be seen within the report by PAGE (2017:18,71,75), for example, in which it is often specified that South Africa's commitment to the green economy is clearly demonstrated in its "policy vision". The lack of effective plans to implement these visions, however, is rarely touched upon within the report. Furthermore, many of the reviewed enthusiastic studies fail to mention that the practical implementability of most green economic initiatives is debatable, considering their drastic nature, coupled with outdated government administrative systems that are unable to facilitate such radical transformative processes (Moyo, 2015; Hamann *et al.,* 2000). Additionally, no mention within the enthusiastic studies is made of the fact that hardly any measurement/indicator systems are in place to monitor the efficiency and progress of the various green economic initiatives, with the exception of the study by Rabie (1999), one of the most dated enthusiastic studies analysed, reiterating the fact that this is a longstanding, unresolved issue (Averchenkova *et al.,* 2019; Cloete, 2018).

Additionally, within these studies, very little attention is given towards the contradictory nature between South Africa's green economic policies and its economic and socioeconomic policies. Although economic/social policies are pivotal within a developing, highly unequal country such as South Africa, the precedence of these policies does nothing to further the green economic agenda within the country, as these policies have been developed mostly according to Northern neoliberal ideologies (Leonard, 2018; Brown *et al.,* 2014). These ideologies have brought about a regime within the country that promotes fossil fuel-based industries and shields corporate conglomerates from having to comply with environmental law and legislation (Leonard, 2018; Brown *et al.,* 2014). Moreover, the studies by Leonard (2018) and Brown *et al. (*2014) point to the fact that South Africa's green economic policies are also based on neoliberal ideation (in the form of the promotion of green growth), and are thus ineffective in truly greening the South African economy, as these policies are aimed first and foremost at economic and socioeconomic development, with any green economic benefits merely being a positive by-product. Indeed, there is a growing body of research that suggests that the green growth interpretation of the green economy is, in fact, very likely to promote the acceleration

of the commodification of nature, as the synergies between growth and sustainability remain fundamentally incompatible (see, for example, Jackson, 2017; Brown *et al.,* 2014; Arsel & Büscher, 2012; Fletcher, 2012; McAfee, 2012; Feindt & Cowell, 2010; Castree, 2008; Himley, 2008).

Certainly, this is not to say that no progress has been made within the country with regard to its green economy initiatives. However, nuance in the way of dissecting the nature and true intent of South Africa's green economic initiatives, acknowledging the general lack of green economic policy coherence and political commitment alongside numerous policy implementation challenges, is lacking within these pieces of literature. Instead of adopting a critical tone, the rhetoric of the reviewed studies is unremittingly positive, presenting the reader mostly with win–win scenarios and an unabated stance on the ability of the green growth interpretation of the green economy to facilitate climate change mitigation.

2.6.2 Critical analysis of the apprehensive literature

When scrutinizing the apprehensive pieces of literature, it became undeniably apparent that some of the sub-themes are direly under-researched. A mere six studies fell under the sub-theme 'over-dependency on brown development', only five studies fell under the sub-theme 'lack of integrating the informal economy', and the sub-theme 'continued commodification of nature' encompassed only six pieces of literature. It is therefore evident that much more policy research is dedicated towards South Africa's lack of green economic policy coherence and implementation. The lack of research surrounding the informal economy, and its potential role in South Africa's green economic endeavours, is especially worrisome, to say the least. This is particularly the case when considering the fact that the informal economy, to date, has played a large role in greening the waste management sector of the country, mostly due to waste reclaimers diverting waste from landfills through recycling and repurposing refuse, all without proper training, mentorship, compensation or acknowledgment by local municipalities (Godfrey *et al.,* 2017). The South African economy consists of a very large proportion of unskilled, informal workers (the informal sector is estimated to be two to three times the size of the formal sector), who could benefit immensely by being more actively involved in the green economic transition (Godfrey, Vozza & Mohamed, 2016).

In the interest of fairness, further analysis of both the apprehensive and enthusiastic literature presented another important consideration: that although faced with slow growth, high unemployment and many other unique domestic challenges which severely complicate the green economy narrative within the country, South Africa has managed to develop an elaborate and consultative climate governance system. The country also remains the only country in Africa to have implemented a carbon tax, and is one of very few developing countries to have done so (Ntombela, 2019; Montmasson-Clair, 2012). The green economic policies drafted thus far, although lacking any proper implementation, present great opportunities for the country to fulfil its obligation to the Paris Agreement, whilst developing socioeconomically. Therefore, the apprehensive pieces of literature could certainly validate the progress the South African government has made thus far, as the green economic transition remains a relatively new endeavour within the country, coupled with the fact that designing and implementing of sectoral and multisector green economic policies involves a growing complexity of immense work.

What is important to note in the apprehensive literature, is that green economic policies that do not fundamentally seek to address the interconnected nature of this climate crisis, which means that we are not nearly close to grappling with the realities of the climate crisis. Whilst we can identify opportunities in our green economic policies, as this systematic literature has shown (with much of the apprehensive literature), opportunities can too easily become cheap platitudes that replace real, urgent and integrated action.

2.7 CONCLUSIONS AND RECOMMENDATIONS TOWARDS A NEW RESEARCH AGENDA

This systematic review has found that South Africa's green economic transition is progressing poorly and arbitrarily, mostly due to the current green economic trajectory of green growth. Although various green economy discourses are present to some degree within South Africa, the green growth discourse certainly seems to be the predominant manifestation. After a critical analysis of the systematic review, it is clear that the green growth discourse within South Africa is merely another form of perpetuating the long-standing narrative that economic growth has indefinite hegemony over any other development path (Bond, 2002). Since the advent of its

democracy, the South African government has promulgated neoliberal policies, projects and laws, which have continuously failed to dispel the high accounts of poverty and inequality within South Africa, and have only further perpetuated several socioeconomic problems within the country[18] (Chandrashekeran *et al.*, 2017; Death, 2014a; Death, 2014b; Cock, 2014; Bond, 2002). This ideation has seeped into South Africa's environmental policy sphere as well, and illustrates the elite's unyielding macro-political route – neoliberalism disguised by sustainable-development rhetoric (Bond, 2002). As such, the green economic policy sphere within South Africa has steadily progressed into a substandard, inefficient form of international reformism.

A green economy should encapsulate a transition that leads to greater resource-efficiency, decarbonization and conservation, but also one which elevates redistributive measures that are able to promote inclusivity and social welfare (Smit & Musango, 2015a). However, within South Africa, as is the case with most other countries, the green economy encapsulates flawed, neoclassical market-based solutions, and therefore holds little value in decreasing social inequality or encouraging sustainability (Brown *et al.,* 2014). This is illustrated by the absolute lack of policies, and policy research, on integrating marginalized South Africans into the green economy narrative. The problematic proliferation of commodifying natural resources (promulgated by the green growth discourse), and the perverse incentives it incites, are likewise not a well-researched subject.

Instead, policy research is predominantly focused on South Africa's policy implementation challenges and administrative difficulties (although these are certainly relevant considerations as well), rather than to question the nature of these policies and the problematic ideation behind their development. In order to gain a complete understanding of the progress that South Africa is making in transitioning towards a green economy, a broader, more holistic understanding of the policy space, beyond just implementation, is required. Hence, it is the recommendation of this article that greater policy research and theorization should be conducted of the

18 It is important to note that the South African government is not wholly to blame; the problem, rather, is systemic: the country still experiences residual economic imperialism by corporate interests and an unnatural degree of ideological devotion to the Washington Consensus world-view (Bond, 2002). It is also to be noted here that although many prominent economists and international organizations (the IMF and the World Bank, for example) are supportive of the Washington Consensus view and its accompanying ideologies, the author of this dissertation, alongside various other leading economists (most notably; Joseph Stiglitz, Dani Rodrik and Ha-Joon Chang), is sceptical of this hegemonic, ambiguous view and the 'blanket approach' it encourages within developed and developing countries alike. Instead, policies should be informed by ideologies that are mindful of the fact that many developing, third world countries are plagued by countless and unique development challenges, which require country-specific solutions.

identified under-researched sub-themes (‘over-dependency on brown development’, ‘continued commodification of nature’, and ‘lack of integrating the informal economy’) and that these be more critically engaged with. Finally, a green economic movement should be initiated that is not built upon the Global North’s neoliberal ideologies, but one that is applicable and sensitive to South Africa’s inherited, post-apartheid environmental challenges and socioeconomic struggles, whilst maintaining a sense of urgency regarding the mitigation of the ever-impending climate crisis.

CHAPTER 3

ARTICLE 2: A COMPARATIVE CASE STUDY ANALYSIS OF SOUTH AFRICA AND BRAZIL'S WASTE MANAGEMENT POLICIES

ABSTRACT

Waste management in South Africa faces numerous complex challenges, such as an ever-increasing population, few sufficient waste management facilities, little to no provision of proper waste collection and disposal services within marginalized areas, scant community-based recycling initiative and participation, and a policy and regulatory environment that does not actively promote the waste management hierarchy. An issue of particular importance was highlighted through the case study analysis – the importance of the informal recycling industry in establishing a low-carbon, sustainable waste sector. The informal economy within South Africa is large and growing, and within the waste sector, it has great potential to contribute immensely towards the generation and redistribution of income, and thus contribute to poverty reduction. This is an important consideration currently, considering the immense socioeconomic difficulties present in the country. However, it was ascertained by this study that current waste management plans and policies do not facilitate the integration of informal waste reclaimers into the waste sector. The case study analysis found, however, that South Africa would do well to look to Brazil's organized informal recycling sector, which is particularly impressive. Brazil's practical and community-based approach to waste management can provide the waste sector of South Africa with valuable perspectives on how to change the current status quo regarding those waste management systems and policies in South Africa which are fundamentally unsustainable (Gutberlet, 2016). Certainly, all lessons learnt from Brazil's case study analysis are fundamental, although one was found to be of particular significance – waste management and policy should be interspersed with community development, and waste reclaimers should be recognized as the vital protagonists in the recycling system.

Keywords: comparative case study analysis, waste management, policy analysis, waste reclaimers, informal economy, South Africa, Brazil

3.1 INTRODUCTION

The systematic literature review in Article 1 revealed numerous, important insights in relation to the overarching themes that can be identified in the literature associated with South Africa's green economic policy. Having a more holistic understanding of this landscape has revealed that there are various areas of contestation which would warrant a more thorough investigation. As such an expansive analysis is beyond the scope of a single dissertation, one policy has been chosen to provide for more detailed investigation to a specific green economic policy: waste management.

Based on the findings of the green economic policy literature review described in Article 1 of this dissertation, waste management policies were revealed to be a prominent and highly contested policy within South Africa, currently. Thus, this article will consist of a comparative case study analysis of this specific green economic policy. A justification as to why comparative case study analysis is an appropriate method is discussed in more detail within Section 3.2.

The aim of providing a more focused analysis of a single policy is to acknowledge that each of South Africa's green economic policies are inextricably interlinked with one another, but that in order for academic research to prove useful for policy makers, I would argue that two kinds of inquiry are important. The first (as has been explored in Article 1) is to ensure a more comprehensive understanding at a systemic level of policy underpinned by economic phenomena. The second (which Article 2 seeks to highlight) is to investigate, on a more granular level, the internal operations, incentives, and institutions of a specific policy which are embedded within the larger policy framework. A detailed analysis of this kind allows for policymakers to more concretely identify challenges and opportunities for reform, especially when this analysis is conducted through a comparative lens, allowing for greater insight in terms of application, whilst still encouraging a context-specific approach. This article will therefore analyse the various waste management Acts and policies within South Africa, comparing these with Brazil's waste management framework. A justification as to why Brazil has been chosen will also be discussed within Section 3.3.2.

Waste management in South Africa faces numerous complex challenges, such as a vastly growing population, limited waste management facilities, inadequate provision

of waste services for rural areas, scant community-based recycling initiative and participation, and a policy and regulatory environment that does not actively promote the waste management hierarchy – to only name a few (DEA, 2011b). Positive trends in waste management, however, have been slowly developing, the most notable being that of the emergence of informal waste reclaimers (more often referred to as waste pickers). South Africa's waste reclaimers collect an astounding 80% to 90% of used packaging and paper items that are recycled, saving municipalities approximately R750 million per year in potential landfill costs (Samson, 2020).

Nevertheless, a definitive waste management approach in South Africa is still greatly lacking; 90% of all the waste generated in South Africa continues to be disposed of at landfills – a waste method associated with many environmental and human health concerns (Godfrey & Oelofse, 2017; DEA, 2012). Additionally, the sustainable financing of both waste management services and infrastructure by the local government continues to be a great challenge, alongside a general lack of compliance with national standards with regard to waste collection as well as waste disposal licensing conditions (DEA, 2019).

3.1.1 The problem of waste management in South Africa

Waste management strategies in South Africa are severely lacking; in 2017, South Africa generated 42 million tons of waste, of which only 11% was diverted from landfills (DEA, 2018). Additionally, according to the DEA (2019), only 7% of waste is reused or recycled. Moreover, ineffective waste management results in irreparable damage being done to the environment, and also causes significant increases of the emission of problematic gases such as methane, a major contributor to global warming. Additionally, South Africa has a vastly expanding population and continues to experience rapid urbanization, and these developments are naturally associated with higher amounts of waste generated. Consequently, due to a complete lack of aggressive strategies to avoid waste generation, the volumes of waste will substantially increase in the future (DEA, 2019). This will, in turn, necessitates a much greater effort to be made in waste diversion and sustainability efforts in general.

Some progress has been made in relation to recycling paper, plastic, glass and metals; however, this is largely due to the collection of recyclable items by the informal sector (waste reclaimers) (Samson, 2020). This, unsurprisingly so, creates some policy challenges around the livelihoods, norms and standards that need to be addressed in the context of political imperatives for radical economic transformation which coexists alongside sustainable development, whilst at the same time increasing the rates of recycling within the country (DEA, 2019). Whilst some notable progress has been made, there is still substantial scope for improving recycling rates within South Africa; progress in diverting waste from landfills has also been very limited (DEA, 2019). This results in significant additional costs for the national government, a loss of potential economic opportunity, and failure to decouple the environment from economic activity. Overall, South Africa's waste management practices remain largely uncoordinated, severely underfunded and generally insufficient.

Thus, this article will provide the South African waste management policy environment with much-needed lessons from Brazil, a fellow BRICS (Brazil, Russia, India, China and South Africa) country that is known for its ground-breaking practice in informal waste management (Gutberlet, 2016; 2015). Within a South African context, very little research in the form of comparative case study analyses has been attempted on the topic of waste management. Accordingly, this article will endeavour to fill this gap in the research, whilst providing insights and guidance for the future of waste management within South Africa. The remainder of this article is divided into four sections. The research method follows the introduction. The third section presents a justification of the topic of waste management at large and on the decision to compare South Africa's waste policies with those of Brazil, specifically. The fourth section comprises a comparative case study analysis, firstly delving into both countries' profiles, encompassing population statistics, political structures, economic landscapes, income levels, and urbanization rates. Thereafter, both countries' waste sectors are analysed, focusing specifically on current waste generation trends and characterization, waste management policy and regulation, and the role of the informal sector in waste management practices. Lastly, recommendations and concluding remarks will be given within Section 3.5.

Based on the contextualisation and explanation set out above, the research question for this article asks: “how does South Africa’s waste management policies compare with Brazil’s waste management policies?”

3.2 RESEARCH METHOD

This article will comprise a comparative case study analysis of South Africa and Brazil’s waste management policies. Put simply, a comparative case study is a comprehensive examination of two or more cases[19], and is concerned with the complexity and specific nature of the case/s in question (Bryman, 2012). Moreover, comparative case studies aim to produce knowledge about certain issues (for example; how certain policies work or fail to work) that is more generalizable (Goodrick, 2014). As with many research terminologies, a ‘comparative case study’ has several definitions, see for example Blaikie (2000), Kaarbo and Beasley (1999), and George (1979). What distinguishes a case study from other research methods, such as cross-sectional designs, is that the researcher is usually concerned to elucidate the unique features of the case, and this process is known as an idiographic approach (Bryman, 2012).

A comparative case study design exemplifies the logic of comparison, implying that social phenomena can be better understood when comparing two or more meaningfully contrasting cases (Bryman, 2012). A comparative case study therefore highlights comparison within and across contexts, as it involves the study and synthesis of the similarities, differences and patterns across two or more cases (Goodrick, 2014). This method, however, goes beyond merely contrasting and comparing, as it utilizes the identified similarities and differences to further understand and explain exactly how context is able to influence the success of, for example a policy, and how to better adapt the said policy to the particular context in order to achieve a predetermined outcome (Goodrick, 2014). This method therefore presents a useful and relevant way to delineate the similarities and differences in waste management policies between South Africa and Brazil. In this comparison, the analysis will be embedded in an understanding of the context specificity of the

19 The exact meaning of the term ‘case’ is varied in this instance, as it can refer to a multitude of different terms, such as a location, a data point, an organization, or a uniquely bounded phenomenon or subject (such as a certain type of policy, programme or process), to name a few (Bryman, 2012; Kaarbo & Beasley, 1999).

specific country in order to avoid simply assuming that complete replicability is possible.

A case study analysis was deemed an appropriate method for this article, as case studies are frequently used as such within the social sciences, particularly within post-graduate research, as it is a suitable methodology for single-person research, whilst allowing the researcher to delve into one aspect of an issue with adequate depth and breadth (Blaikie, 2000). The aspect of waste management policy in this instance was approached with breadth by assessing each country's specific economic, socioeconomic and political features, and with depth by analysing both countries' policy space dating back as far as the 1980s. A comparative case study analysis was chosen rather than a single case study, as the former involves work that is more extensive in a conceptual and analytical sense (Goodrick, 2014). A more extensive conceptual analysis is required due the inherently interconnected nature of ecological economics. Whilst this article drills down more specifically into waste management policy, this policy remains embedded in a myriad of interconnected developmental questions of sustainability, amidst the drive for economic growth, employment opportunities and the informal sector, to name a few. The interconnectedness and intricate nature of this policy thus necessitates a comparison with another country that has also had to navigate these various spheres, rather than to assess it in isolation. This will also allow for the study to benchmark South Africa's policies against a standard that is relevant and realistic, given the nature of Brazil's institutional arrangement.

Moreover, this particular methodology was chosen to enable the drawing of guidance from another country's existing waste management literature and experience, in order to gain a better understanding and synthesis of this specific green economic policy, particularly in the context of another developing country's perspective. Moreover, a comparative study will better enable policymakers to identify the similarities, differences, triumphs and deficiencies of Brazil's waste management policies in relation to South Africa's, and identify how these comparisons can shape and enhance South Africa's waste management policy framework.

3.2.1 Method

The comparative case study analysis process employed by Goodrick (2014) was utilized in carrying out the comparative case study analysis. Below each of the steps are explained and applied in order to ensure the foundation is set to accomplish the case study analysis. Section 3.3 provides a justification for why waste management policies in South Africa and Brazil were chosen for this comparison. Section 3.4 then commences with the actual case study analysis.

3.2.2 Step 1: Clarify the key evaluation questions (KEQs)[20] and purpose of the evaluation

In order to determine whether the use of a comparative case study is an appropriate research design for achieving the required study outcomes, the purpose and rationale for selecting the determined cases should be explored and explained (Goodrick, 2014). Within this article, the purpose of selecting a comparative case study is to gain a broader understanding of the implications of the identified similarities and differences across Brazil's and South Africa's waste management policy frameworks in order to guide policymaking and further implementation within South Africa's waste management sphere. The rationale for deciding on these two specific countries and the topic at hand (i.e. waste management) is discussed in more depth within Section 3.3 of this article.

The key evaluation questions that guided this article were: "How does South Africa's waste management policies compare with those of Brazil in terms of encouraging green growth?" and "What are the opportunities for the application of Brazil's waste management policies, to the South African context?" These two questions act once again as a guide to answer the broader research question of this article: "How do South Africa's waste management policies compare with Brazil's waste management policies?"

3.2.3 Step 2: Identify initial theories

Any topics that warrant further explanation and/or investigation to sufficiently conduct the analysis should be included within this step. Comparative case study analyses

20 Evaluation questions regard overall performance, which the evaluation should aim to answer. KEQs are based on the purpose of the evaluation.

are most effective when informed by a sound theoretical framework (Goodrick, 2014). This framework should be thoroughly explained from the outset of the study to assist in identifying which properties and dimensions of the cases will be explored (Goodrick, 2014). This may be done by utilizing previous research/theoretical development around the subject or by perusing existing policy and/or programme documentation. Whilst these 'initial' theories are vital, the analysis ought to remain receptive to any new lines of inquiry that inevitably arise from the analysis, which is by its very nature an iterative process (Goodrick, 2014). The discussion below explains the theories that the analysis will be drawing from, as these form the basis on which this article's method is built.

3.2.3.1 Waste Management theories

In a period of ever-increasing industrialization and urbanization, the production of waste is an inevitable outcome of developmental activities. The 2014 Waste Amendment Act defines waste as any substance, material or object that is unwanted, rejected, abandoned, discarded or disposed of, by the holder of the substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered, and includes all wastes as defined in Schedule 3 to the Act (DEA, 2018). Waste, in the form of consumer waste or industrial waste (which can take the form of solid, liquid or gas) is mostly hazardous to both the environment and human health; this necessitates the use of comprehensive pollution and waste management systems (Makgae, 2011). Moreover, integrated pollution and waste management is a vital aspect in the process of attaining sustainable development (Makgae, 2011). The circular economy is a useful concept to use in order to understand the implementation of a typical waste management hierarchy, with regard to its contribution to the green economy and the decoupling of economic activity from negative ecological impacts (DEA, 2019). The circular economy essentially entails a 'closing of the loop' between waste removal and resource extraction activities (Lahti, Wincent & Parida, 2018). This is done by means of waste-avoidance, reusing, repairing and recycling throughout the economic cycle in order to not only reduce waste, but also to displace the demand for virgin materials/inputs by repurposing waste.

Waste prevention is typically the first and main priority of most waste management practices, which also integrate the main overarching goal of waste management – the conservation of resources (Pongrácz, Phillips & Keiski, 2004). The prevention of waste involves the use of various intervention measures that are designed to reduce and, as far as possible, avoid the creation of waste in its entirety. Examples of this include cleaner production practices, stricter regulations around the packaging and design of products, and industrial symbiosis[21] (DEA, 2019). Furthermore, the use of waste as a resource is generally considered the subsequent priority of waste management (Pongrácz, 2002). This mostly involves putting measures in place that will stimulate a secondary-resources economy, based primarily on recycling efforts and the recovery of materials and energy from waste sources (DEA, 2019).

Although the waste sector merely accounts for an approximate 3–5% of anthropogenic GHGs, worldwide, it fronts a unique position to significantly reduce global emissions (Gouldson, Sudmant, Khreis & Papargyropoulou, 2018; UNEP, 2010). The recovery (in the form of energy or secondary materials) and restriction of waste has the potential to reduce emissions from all other sectors within the economy, i.e. energy generation, transportation, manufacturing, mining, and forestry and agriculture (Kennedy, Steinberger, Gasson, Hansen, Hillman, Havránek, Pataki, Phdungsilp, Ramaswami & Mendez, 2009). More specifically, sustainable waste management practices produce the following variety of substantial climate benefits: reducing the use and extraction of natural materials, reducing gas emissions from landfills, replacing virgin materials with recycled/recovered resources, and replacing fossil fuel-based energy production with energy generated from waste and carbon bound in soils through the application of compost (UNEP, 2015).

The Fourth Assessment Report by the IPCC (2007) determined that the potential of the waste sector in climate change mitigation efforts is three times higher in developing countries than in developed countries. This highlights the importance of promoting and enhancing sustainable waste management strategies within developing nations (Dedinec, Markovska, Ristovski, Velevski, Gjorgjievska, Grncarovska & Zdravevac, 2015). Additionally, sustainable practices and resource efficiency within the waste sector not only assists in restricting and preventing

21 Industrial symbiosis is an eco-innovative, resource-efficient approach whereby unused or residual resources of one company are used by another (Chertow, 2000).

harmful GHG emissions, but also offers great economic and social opportunities and benefits (New Climate Economy (NCE), 2015; Barrett & Scott, 2012). These will be identified and analysed in more depth within Section 3.3 of this article.

3.2.3.2 The linkages between waste management and ecological discourses

This section presents a brief history of the ideological shifts that have occurred over the past few decades concerning the rise of integrated waste management systems, and more recently, the appearance of the circular economy that has infiltrated the discourse of government, industry and academia.

In a broad sense, the emergence of sustainable, low-carbon waste management has multiple roots and interlinks with many parallel lines of thought (Gutberlet, Carenzo, Kain & de Azevedo, 2017). The circular economy, ecological economics, and the social and solidarity economy are all useful concepts through which to conceptualize the development of green waste management practices. Ecological economics, as was discussed more extensively within Chapter 1 of this dissertation, focuses extensively on the relationship between a nation's economies and ecological systems. The circular economy, on the other hand, views the economy as a system that is closed and circular, in which waste is used as a main resource for production purposes (Gutberlet *et al*., 2017). Although the circular economy is a theory central to this specific green economic policy, ecological economics is also pertinent as it includes discourses relating to waste management, such as zero-waste, regeneration, and de-growth theory (Mauch, 2016; Bauhardt, 2014).

More recently, however, the concept of an integrated waste management sector has become paramount, as the issue has arisen of including large populations that are impoverished and marginalized into social networks (Velis, 2017). This necessitates enhanced public participation on the formulation, application and evaluation of policies relating to waste management (Gutberlet *et al*., 2017). Therefore, the social and solidarity economy becomes a relevant theoretical perspective. This theory focuses on average practices of alternative ways of living, producing, and consuming (Kawano & Miller, 2008). Moreover, issues such as participative policy formulation and decent working conditions, sustainable livelihoods, and social enterprises are

central to this theory, to name only a few (Laville, 2015; Caruana & Srnec, 2013). The social and solidarity economy highlights the importance of social and human assets dimensions and promotes varied forms of collective organization, such as cooperatives, grassroots organizations, and unions (Laville, 2015; Caruana & Srnec, 2013). Additionally, and most importantly, this theory aims to create non-capitalistic economic relations and forms of grassroots socioeconomic organizations, which should triumph over standardized hierarchical and dictatorial models and operations (Moulaert & Ailenei, 2005). The historically marginalized, discriminated against and politically, socially and economically excluded are considered to be particularly integral to such transformations (Gutberlet *et al*., 2017).

3.2.4 Step 3: Define the type of cases that will be included and how the case study process will be conducted

The amount of cases included is generally limited within a comparative case study analysis, as an in-depth understanding of each case is required, which naturally necessitates intensive research and analysis (Goodrick, 2014). Therefore, a large number of cases within such an analysis generally implies that a few trade-offs have to be made in terms of the detail and depth of the study (Goodrick, 2014). Dyer and Wilkins (1991) further stipulate that such a multiple-case study analysis often results in the researcher paying more attention to the ways in which the various cases can be contrasted with one another, rather than paying attention to the specific context in question. Additionally, the need to establish comparisons often means that an explicit focus is adopted at the outset of conducting the research, whereas a more open-ended approach might render more valuable findings and unique comparisons (Bryman, 2012).

In order to provide sufficient depth to analysing this policy, this article does not aim to complete comparative case studies of every green economic policy in South Africa, nor compare it with a myriad of different countries. The topic of waste management relates to many important aspects in the broader approach to green economic policy in South Africa. This study will therefore encompass two case studies only: South Africa's waste management policy framework, as compared with that of Brazil.

A case study protocol that outlines the exact processes of information collection is helpful in order to gain some degree of conceptual clarity in the selection of the

appropriate cases (Goodrick, 2014). This will also ensure that systematic procedures are put in place, which will assist in conducting the actual comparative analysis stage (Goodrick, 2014). This case study is regulated to a degree by pertaining to the following eight subjects: each country's population statistics; political structures; economic landscape; income levels; urbanization rates; waste generation trends and characterization; waste management policy and regulation; and the role of the informal sector in waste management practices. The informal economy was included within this analysis because it features as a prominent and important actor within both countries' waste sectors. These predetermined subjects serve, in essence, as the conceptual framework against which South Africa's and Brazil's waste management policies are analysed. It is to be noted that, although these subjects regulated the case study analysis process, this article remained open to new lines of inquiry and theoretical reflections that had not been pursued from the outset.

3.2.5 Step 4: Identify how evidence will be collected, analysed and synthesized within and across cases, and implement the study

A comparative case study analysis can be exemplified by many different approaches, and may thus employ different methods in order to gain a holistic understanding of the chosen cases and relevant contexts (Goodrick, 2014). A qualitative, quantitative or mixed methods approach can be utilized, depending on the research question in hand (Bryman, 2012). This article encompasses a qualitative comparative case study approach. Bryman (2012) notes that a qualitative case study strategy tends to take an inductive approach to the relationship between theory and research, which applies to this article. This comparative case study's inductive method will show how the analysis of the specifics relating to waste management policies in South Africa is applicable for the general and broader discussion relating to green economic policies.

Furthermore, the following techniques and data collection methods were employed within this article: document analysis, concept development, theory testing, and the process of synthesis. Keywords, such as waste management, waste sector, waste management policy framework and informal waste economy, were used in conjunction with South Africa and Brazil and entered into Google, Google Scholar, and the NWU library's databases. South Africa's Department of Environmental

Affairs and Department of Statistics provided many key documents to this study, as did Brazil's Institute of Geography and Statistics department and Institute of Applied Economic Research. Naturally, thereafter, the process of comparing and contrasting within each case and between cases commenced. The dimensions compared were defined by the eight subjects identified within Step 3 of this section, as well as the theoretical framework explained within Step 2 of this section. The study is implemented within Section 3.4 of this article.

3.2.6 Step 5: Consider alternative explanations for the outcomes and report findings

This explanatory step identifies and discerns new observations gained from the identified patterns and relationships highlighted by the comparative analysis (Goodrick, 2014). Moreover, additional evidence is gathered within this step in order to corroborate or test these observations, in order for the study to attain additional rigour and sound verification. The inclusion of multiple explanations, data sources and methods assists in overcoming the bias that single method or theory studies are often prone to, and strengthens the observed research assessment (Goodrick, 2014). This step is done iteratively within Sections 3.4 and 3.5 of this article. Thereafter, the findings are reported within the concluding section (Section 3.5) of this article. The insights garnered from the case study will be outlined and recommendations will be given to policymakers in a way that is practical and approachable.

3.3 JUSTIFICATION

In order to justify this article's emphasis on the waste management sector, this section offers a brief review of some of the benefits that a low-carbon, sustainable waste management sector can produce, particularly within developing countries. More specifically, this section will focus on the potential benefits pertaining to health and the environment, the green economy, and its relation to employment and poverty alleviation. It is to be noted that this review is by no means an exhaustive account of all the various benefits a resource-efficient waste management framework presents, but merely an account of those benefits most relevant and useful to South Africa, a developing, middle-income country.

3.3.1 The importance of waste management

The Fourth Assessment Report by the IPCC (2007) determined that the potential of the waste sector in climate change mitigation efforts is three times higher in developing countries than in developed countries. This highlights the importance of promoting and enhancing sustainable waste management strategies within developing nations. Moreover, inadequate waste management systems can adversely affect human health and the environment by polluting outdoor air, water and soil (Wilson, Rodic, Scheinberg, Velis & Alabaster, 2012; Seng, Kaneko, Hirayama & Katayama-Hirayama, 2011). Low- and middle-income countries are especially vulnerable as a large amount of unregulated waste disposal sites and poor waste management practices are still largely prevalent (UNEP, 2015; UN-Habitat, 2010). Unlike developed countries, the exposure to detrimental emissions and contaminated waste matter from landfills is considerably higher within developing countries, especially for those individuals residing in marginalised areas (UN-Habitat, 2010). This is largely due to the fact that environmental, health and safety regulations are simply not as severe within developing countries (UN-Habitat, 2010). The health and environmental benefits of a low-carbon, resource-efficient waste sector are extensive, and urgently needed within most developing countries' rural and urban areas.

Within South Africa (as is the case in Brazil), waste management – particularly recycling initiatives – is also relevant to important socioeconomic issues such as poverty alleviation, employment, and economic development (Langenhoven & Dyssel, 2007). In particular, sustainable waste management practices within South Africa depend largely on the prevalence of the informal economy (Sekhwela & Samson, 2020). The informal economy in this regard consists mostly of independent waste reclaimers (or waste pickers), who comprise individuals who typically work in an informal capacity to gather, sort and sell recyclable waste materials for a livelihood (Marello & Helwege, 2014; Schenck, Blaauw & Viljoen, 2012). Currently, an estimated total of 60 000 to 90 000 waste reclaimers are active in South Africa; an amount that is most likely grossly under-estimated, as these informal workers are unregistered and unregulated (Samson, 2020; Schenck, Blaauw & Viljoen, 2016). Clearly, the waste management sector could represent a valuable opportunity for the

creation of green jobs within South Africa by integrating these workers into formalized waste collection and recycling strategies, which is presently a vital task, considering South Africa's extremely high unemployment rate of 42.0%[22] (Stats SA, 2020). It should be noted that these are the latest figures that have certainly been exacerbated by the 2020 Covid-19 pandemic. Nonetheless, within 2020's quarter 1, the unemployment rate was at 39.7%, so it still remains a major problem, even before one needs to take into account the effect of the pandemic (Stats SA, 2020).

Presently, however, waste reclaimers are entirely excluded from the formal waste management narrative. Although the 2011 National Waste Management Strategy (NWMS) and the National Environment Management Act 59 of 2008 (NEMA) acknowledge the vital role that recycling plays within impoverished communities, these informal workers, and the invaluable service they provide, remain omitted and unrecognized (as is the case in most other countries) from national and local waste policies, strategies and legislation (Schenck *et al.,* 2016). This article therefore aims to highlight the importance of having inclusive waste management strategies that not only enable the continued functioning and income of waste reclaimers, but also ensure that the profession becomes formally recognized as a legitimate occupation, and that reclaimers are able to operate under decent working conditions, accompanied by a decent living wage.

3.3.2 Justification for choice of countries

Brazil was chosen for this comparative case study analysis because this developing country is distinguished as being one of the world's most progressive countries in recognizing the importance of the informal sector in solid waste management systems (Gutberlet, 2016, 2015; Dias, 2011). Waste reclaimers within the country are recognized as a vital profession, and are integrated into the waste management system and the national economy (Gutberlet, 2015; Wilson *et al.,* 2012). The country has a long history of high commitment to institutional development in the solid waste area (Wilson *et al.,* 2012). Accordingly, its waste management practices can be insightful and valuable for South African waste management policymakers, particularly as South Africa shares some of the institutional, political and economic arrangements of Brazil. More detail will be provided on these arrangements within

22 The unemployment rate according to the expanded definition (Stats SA, 2020).

the case study analysis (Section 3.4), highlighting the comparisons of these two countries.

Finally, South Africa was chosen for this comparative case study analysis, considering the country's extremely high unemployment rate, coupled with the valuable job opportunities that incorporating the informal economy into the waste sector could potentially bring about for the country's most impoverished. Moreover, recent data released by the United Nations Statistics Division (UN Data) (2017) show that South-Africa's CO_2 emissions have almost tripled from 1975 to 2014 (from 185 202 thousand metric tons to 489 772 thousand metric tons), placing the country amongst the top twenty countries in the world that emit the most CO_2 (UCS, 2019). Hence, it is of the utmost importance that all industries and sectors within the South African economy are effectively made more sustainable. Promoting a low-carbon, resource-efficient waste management sector is certainly an important step in this regard. Additionally, this study pertains to South Africa as it is geographically relevant to this study.

To conclude this section, it is clear that the waste management sector has the ability to facilitate a range of significant benefits: the creation of green jobs, reducing poverty and inequality, decreasing pollution and carbon emissions, and so forth. These benefits, however, are all very dependent on context-specific factors, such as the economic, political, social and geographical landscape of the relevant country (Gouldson *et al.,* 2018). Therefore, this article has undertaken a case study analysis, comparing South Africa's waste management sector with that of Brazil, a country which shares many of South Africa's context-specific factors. Although both countries are uniquely bounded in a historical and geographical sense, the insights garnered from Brazil remain greatly applicable within South Africa, as both countries share fairly similar economic, political and social landscapes. Gaining greater knowledge from Brazil can inform policies that promote green employment opportunities in the waste management sector, which will in turn facilitate a fair and inclusive transition to a green economy.

3.4 COMPARATIVE CASE STUDY ANALYSIS

3.4.1 Brazil and South Africa's country profile

In order to adequately compare and analyse South Africa's waste management policy framework with that of Brazil, the specific country features of both are thoroughly described within this sub-section. More specifically, the population statistics, political structures, economic landscapes, income levels and urbanization rates will be discussed. A comprehensive understanding of each case is vital in order to establish the necessary foundation for the analytic framework that will be utilized in the cross-case comparison study. Moreover, many of the country features discussed in this section are significant drivers and/or pressures of waste, therefore directly affecting the production and management of waste in these two countries. The country profiling below is by no means a completely exhaustive analysis of the various complex aspects highlighted within this section, as that would be beyond the scope of this dissertation; however, some of the key components are emphasized here in order to ensure meaningful comparisons.

3.4.1.1 Population estimates

The populations of both countries are important to consider, given the imperative interlinkages between the size and growth of a population and the subsequent amount of waste generated. The most recent population estimate by Stats SA (2019) places South Africa's population at 58.78 million. The Gauteng province houses the largest share of the South African population, with an estimated 15.2 million (25.8%) residents (Stats SA, 2019). KwaZulu-Natal accounts for the second largest population within the country, at an approximate 11.3 million (19.2%) (Stats SA, 2019). On the other hand, the Northern Cape province contains the smallest share of the South African population, with only 1.26 million people (2.2%) (Stats SA, 2019). The estimated overall population growth rate increased from 1.0% for the period 2002–2003 to 1.4% for the period 2018–2019 (Stats SA, 2019). This reiterates the importance of enhancing the South African waste management sector, as increasing population rates are almost always coupled with increases in the amount of waste generated, as is highlighted in Section 3.4.2.2. Despite the fact that Brazil has a significantly higher population (as can be seen below), the country has managed to

put in place waste management policies that deal better with the amount of waste generated.

Brazil, the fifth largest country in the world and the fifth most populous, has a population of approximately 211.7 million; nearly four times larger than that of South Africa (Brazilian Institute of Geography and Statistics (IBGE), 2020a; World Bank, 2016b). The estimated overall population growth has been steadily decreasing, from 1.53% in 2000, to 0.72% in 2020 (Worldometer, 2020). However, this has not led to a decrease in waste generation, as can be seen within Section 3.4.2.2 of this article. The most populous region in Brazil is located in the Southeast, with an approximate 89 million residents, and includes São Paulo, Minas Gerais, the coastal states of Espírito Santo, and Rio de Janeiro (IBGE, 2020a). São Paulo houses an incredible 46.2 million residents, and is one of the most populous cities in the world (IBGE, 2020a). South Africa has similar major metropolitan areas, such as the Gauteng province, which generates an immense amount of waste, similar to cities such as São Paulo.

3.4.1.2 Political history and structures

As is well-known, the political history of South Africa is particularly vast and unique, and any nuanced account to adequately describe the various events that transpired in order for the country to gain democracy would be innumerably extensive, which is outside of the scope of this study, and would not do justice to the numerous injustices that has transpired within the country[23]. However, a brief summary is appropriate, in order to adequately contrast and compare South Africa's waste management policies (which remain disparate and predisposed to mostly favour the wealthy, urban regions of South Africa) with those of Brazil. In 1994, euphoria came to South Africa when the first democratic constitution was inaugurated; the African National Congress (ANC) party won the election, and has been the governing political party ever since (Thompson, 2001), with Cyril Ramaphosa being inaugurated as the current President in 2018. However, although a significant step forward, it would not immediately lead to the growth of a truly democratic, inclusive society. A study published in 2001 (Thompson, 2001) reported that most sectors and

23 A thorough, excellent account of South Africa's political past can be found in Thompson (2001) and Terreblanche (2002).

institutions, including the judiciary, police force, army and municipal administrations, were still then dominated by the previously advantaged racial group.

Although progress has been made to ensure a progressive and equal society in the past 26 years, much in the way of service delivery, fair and decent job opportunities for all, equal land ownership, and gender equality (to name only a few) has to be done (World Bank, 2018d). The mismanagement of waste remains likewise a predominant issue, disproportionately affecting impoverished South African citizens and their quality of life (Rodseth *et al.,* 2020). The Constitution of the Republic of South Africa, 1996, established the Bill of Rights, which stipulates that all people in South African have the right to an environment that is not an infringement on their health or wellbeing (Makgae, 2011). Thus, legislative measures that are more stringent should be implemented to ensure an environment that is safe, preserved, and protected for all people in South Africa in the future.

Brazil, as in the case of South Africa, has undergone a unique political history, and has faced great difficulty in attaining democracy. Brazil's political environment is briefly summarized in this section; however, this summary is not meant to be exhaustive in its scope, but merely to point to the fact that both Brazil and South Africa have experienced unusual political trajectories, which have altered the course of their development paths. After the 1964 military coup, which lasted two decades, Brazil re-entered into democracy in 1985 (Bresser-Pereira, 2017). After many years of colonization and military dictatorship, the country's socioeconomic problems were rife, and the Brazilian economy was fast deteriorating (Hagopian & Mainwaring, 1987). Since then, much progress has been made by the implementation of 'welfarist' policies and ideologies, as South Africa has managed to do with its expansive social grant system. However, the country still has a long way to go in ensuring an inclusive state for all Brazilian citizens, as is the case in South Africa as well (World Bank, 2018d; World Bank, 2016b). Neoliberal economic reforms within the country have prevented a truly transformed state from coming about, as these have only held in place the dictatorial arrangements of the governing processes inherited from the previous political period (Codato, 2006). Moreover, the task of implementing and formulating progressive economic and social policies, an inherently difficult task to begin with within such a divided country, is made exceedingly difficult within the country, due to a highly fragmented political landscape

(World Bank, 2016b). Complex coalitions and a large number of parties represented in parliament have adversely affected the success of important policy priorities (World Bank, 2016b). Jair Bolsonaro is the current President of Brazil, recently appointed in January of 2019, and he established the Alliance for Brazil (APB) party later that same year (Fagundes & Iglesias, 2019). Both countries have come under new leadership fairly recently, which might present an opportunity for change within the South African waste sector framework.

3.4.1.3 Economic landscapes

The present economies of both countries are essential considerations to this study, given that economic growth is a prominent driving force behind many polluting industries, such as manufacturing and construction (DEA, 2018). Economic growth can also indirectly affect the generation of waste by increasing the income levels of residents in a country. Although often labelled a developing country[24] by global standards (low standards of living, low Gross Domestic Product (GDP) per capita), South Africa possesses many qualities of a developed country; for example the country experiences high levels of urbanization, possesses ample wealth in urban regions, and has adequate public infrastructure (Rodseth *et al.,* 2020). The country also boasts the largest economy in the Southern Africa region, and forms part of BRICS (the five major emerging national economies in the world) (World Bank, 2018c). The South African economy, however, measured in this instance in terms of the country's GDP, has contracted by a 16.4% decrease in the GDP growth rate for the second quarter of 2020 (Valodia, 2020). The country's expanded unemployment rate is incredibly high, at 42.0% (Stats SA, 2020). Naturally, these statistics have been aggravated by the on-going Covid-19 pandemic of 2020; however, the GDP growth rate in the first quarter of 2020 (ahead of the pandemic) remained fairly low, at a negative growth rate of minus 2% (Stoddard, 2020). Additionally, the expanded unemployment rate in the first quarter was still shockingly high at 39.7%, highlighting the fact that South Africa's economic development remains a major problem, even before one needs to take into account the effect of the pandemic (Stats SA, 2020).

24 It is to be noted that there is a complex system of classifying countries beyond this binary of developing and developed.

Levels of development are exceptionally disparate (South Africa has the world's highest Gini Coefficient at 0.63 and Palma Ratio at 10.13[25]), a result of nearly 50 years of institutional racial segregation, especially with regard to service delivery (Rodseth *et al.,* 2020; World Bank, 2019c; World Bank, 2018b). Remote rural or inaccessible informal municipalities are especially neglected, and generally receive substandard services when compared with urban areas, waste management being a pivotal case in point (Stats SA, 2016). Although waste management is a responsibility of the local government, large disparities are present between different regions, and smaller, rural areas often lack the capacity to render complete waste services (the proper collection and disposal of waste) (Friedrich & Trois, 2010).

Brazil has the largest economy in South America, much as South Africa has the largest economy in the Southern African region, and is one of the world giants in the mining, agriculture and manufacturing industries, and dominates the coffee, sugar and soya bean markets (Amann & Baer, 2012). Moreover, the Brazilian economy is considered as one of the largest emerging markets in the world, and forms part of BRICS (Amann & Baer, 2012). However, although possessing some characteristics of a developed state, the country is still considered a developing country by most criteria. While abundant in valuable capital such as agricultural land, renewable, non-renewable and other natural resources, Brazil faces many developmental challenges, such as lack of proper infrastructure, widespread poverty (9.3 million Brazilians live in extreme poverty) and extremely high inequality – many of the same issues South Africa is burdened with (World Bank, 2020; World Bank, 2016b; Amann & Baer, 2012; Maxwell, 2007). This is evident from the country's high Gini Coefficient of 0.54 (World Bank, 2018a). The country's unemployment rate is fairly low, at a current rate of 13.3% (World Bank, 2020). In the second quarter of 2020, Brazil's economy contracted by a historic 9.7% (World Bank, 2020). Although this contraction was largely attributed to the pandemic, Brazil's economy has remained weak since its infamous 2014–16 recession, with a recorded 1.3% real GDP growth rate in 2017 and 2018, and 1.1% GDP growth in 2019 (World Bank, 2020).

25 This means that the top 10% of income earners in South Africa earn roughly 10 times as much income as the bottom 40% do.

3.4.1.4 Income levels

Given the many interconnections between income levels, standards of living, consumption patterns and the generation of waste, household/individual income is likewise a relevant and vital consideration. The per capita domestic waste generation rates in South Africa are indicative of this; low-income households have a 0.41 (kg/capita/day) rate, middle-income households are at 0.74 (kg/c/day), and high-income households have a rate of 1.29 (kg/c/day) (Rodseth *et al.,* 2020; DEA, 2018; DEAT, 2006). According to the DEA (2018) and Stats SA (2011), 0.6% of South African citizens are from high-income households, 8.2% are from middle-income households, and 91% are from low-income households. In this instance, low-income households were defined as those earning between R1-R19 200; middle-income households between R19 201-R307 200; and high-income households at R307 201 and above (Stats SA, 2015).

For the year 2019, South Africa's Gross National Income (GNI) per capita was recorded to be at USD6 040, whilst Brazil's GNI per capita for the same year was reasonably higher, at USD9 130 (World Bank, 2019a; World Bank, 2019b). The most recent National Household Sample Survey of Brazil (PNAD) determined that the nominal monthly household income per capita was R$1 438.67 for the year 2019 (IBGE, 2020b). A more detailed analysis of Brazil's income statistics could not be undertaken as other more detailed sources were not available in English.

3.4.1.5 Urbanization

Urbanization is also a topic closely linked to economic growth and development, and therefore waste generation (World Bank, 2012b). Domestic solid waste generation rates are particularly high within urban areas, as these areas are generally home to wealthier residents, whose purchasing habits are far more extravagant, and in some instances consist of store-bought and/or single-use plastic items (DEA, 2018). South Africa, as in the case of most developing countries, is experiencing continual urbanization; most citizens reside in large, urban cities (Johannesburg, Tshwane and Cape Town, for example) which dominate the country's economy, producing over 80% of the national gross value added (GVA) (Department of Co-operative Governance and Traditional Affairs (COGTA), 2015). Additionally, large cities are

growing at twice the speed when compared to smaller cities and towns, and average incomes in these areas are 40% higher than the national average (DEA, 2018). As a result, most of these cities' waste management and collection systems are facing extraordinary pressure to process such ever-increasing levels of waste generation (COGTA, 2015).

Brazil has undergone rapid and continual urbanization in the past few decades, which poses a great risk to sustainable livelihoods, increases the environmental footprint of cities, and greatly contaminates the environment (transport-related air pollution is a particularly major health hazard in the country) (World Bank, 2016b). The South-Central region of Brazil, consisting of the South-east, South and Mid-west regions, is the most populous region in Brazil and, unsurprisingly, produces the most waste within the country (Alfaia, Costa & Campos, 2017). This socio-geographic region experiences high economic activity and intense rates of industrialization and urbanization; the highest GDP contribution within the country originates from this region, as well as the highest national production in almost all sectors (Alfaia *et al.,* 2017). Waste management practices are especially under pressure within the cities of São Paulo and Rio de Janeiro – two of the cities in Brazil with the highest population rates. However, waste practices within these cities remain at a high standard so far, despite all these pressures, especially when compared with South Africa's urban areas (Maxwell, 2007).

From the above country profiling, it is clear that both countries share many similar features; both are developing countries with emerging economies in the BRICS group, and both are considered to be upper-middle income countries (World Bank, 2011). Brazil is a federal presidential constitutional republic based on a representative democracy, and South Africa is a parliamentary representative democratic republic (Government of South Africa, 2020; Pátria Amada Brasil, 2019). Both countries have attained democracy with difficulty and still suffer great repercussions from their political pasts. Socioeconomic conditions within both countries have improved substantially, but most citizens are impoverished and remain marginalized. Both countries are currently experiencing fairly low levels of economic growth and development, widespread unemployment and crippling inequality, although South Africa's unemployment rate and inequality statistics are far higher than those of Brazil (or most countries for that matter). Brazil's population

is far greater than South Africa's, although both countries' waste management systems experience unrelenting pressure within urban and densely populated regions and cities, which are continuously and rapidly growing within both countries.

3.4.2 Brazil and South Africa's waste sectors

3.4.2.1 Waste management approach

In both South Africa and Brazil, waste management is approached similarly by means of a waste hierarchy. This is a novel international method that comprises a number of levels, each indicating a suitable approach to waste management, arranged in descending order in terms of which method takes precedence (DEA, 2018; UN-DESA, 2010). The hierarchy of methods is: firstly (and the most preferred), to avoid waste in its entirety; secondly, to reduce waste generation; thirdly, to reuse or repurpose waste; fourthly, to recycle waste into new, usable material; fifthly, to recover certain parts/material of an item; and lastly, to treat and dispose of waste, which is the least desirable option (Makgae, 2011). The minimization of waste is an elaborate process, involving many different stakeholders in the production, packaging, marketing, selling and consumption of products, all of whom should consciously maintain a strong commitment to reduce their waste generation rates (Makgae, 2011).

3.4.2.2 Current waste generation trends and characterization

When compared with other developing countries, South Africa's waste generation is disproportionately high, with the majority of waste being generated by the country's upper-class citizens (UN-DESA, 2010). Moreover, the country's annual waste is increasing at approximately 2% to 3%, primarily due to the country's ever-expanding industrial and manufacturing economy, urbanization, population growth rates and rising income levels (DEA, 2018; UN-DESA, 2010). The most recent State of Waste Report found that 42 million tonnes of general waste were produced in 2017, of which only 11% (4.9 million tonnes) was recycled (DEA, 2018). The largest contributor of general waste was found to be from biomass produced by sawmills, sugar mills, and paper and pulp industries (DEA, 2018). Hazardous waste, such as radioactive waste, medical waste and E-waste (electronic waste) within the country is also growing at an alarming rate (UN-DESA, 2010). Approximately 38 million

tonnes of hazardous waste were produced within 2017, of which only 7% was recycled (DEA, 2018). Waste of this harmful nature necessitates specially built, authorised waste disposal facilities, of which South Africa has only 36 (UN-DESA, 2010).

Additionally, the General Household Survey conducted by Stats SA (2018) determined that household refuse removal increased from 56.1% of households having their waste removed at least once per week in 2002, to 64.7% in 2018. Moreover, urban households were found to more likely have received refuse removal services than households residing in rural areas, with the latter having to rely on their own waste removal methods (usually open dumping). It was found that 81.9% of rural households disposed of refuse themselves, while only 10.6% of urban households and only 4.5% in metropolitan areas did so (Stats SA, 2018). The lack of regular waste collection services across South Africa has led to excessive illegal dumping and littering, which greatly effects the environment and human health (DEA, 2018).

These issues, coupled with the fact that landfilling is still predominantly the country's main method of waste disposal (90% of all waste ends up in landfills) (Godfrey & Oelofse, 2017; Godfrey, Vozza & Mohamed, 2016; DEA, 2012; UN-DESA, 2010), is cause for great concern regarding the future of waste management in South Africa. Landfilling is an outdated, unsustainable and hazardous waste solution, often open and unregulated, and poses a host of environmental and human health concerns (Godfrey & Oelofse, 2017; Godfrey, Vozza & Mohamed, 2016). According to the most recent State of Waste Report by the DEA (2018), 56.4% of all known landfill sites operate without a mandatory waste management licence (WML). Moreover, many licensed landfills are not compliant with the stipulated conditions of these licences, and several serious contraventions are recorded annually by the DEA (2018). Additionally, the remaining landfill capacity of some of South Africa's largest municipalities is seriously dwindling; Cape Town and Johannesburg, for example, only have five and eight years' worth of landfill capacity left, respectively (DEA, 2018; South African Cities Network (SACN), 2014). Given South Africa's overreliance on landfilling as the predominant waste disposal method, it is evident that low-carbon, sustainable waste management options should be pursued urgently and indefinitely. These challenges, however, present a valuable opportunity for South Africa to learn

from the successes and failures of other countries' waste management policies and technologies, and then implement these lessons within the domestic waste sector.

Brazil's waste generation statistics are nearly twice as much as those of South Africa, most likely due to Brazil's far larger population numbers. Since the early 2000s, municipal solid waste has increased at an estimated 31%, surpassing the country's population growth rate of 7% in the same time period (Alfaia *et al.,* 2017; ABRELPE, 2016; IBGE, 2015). Indeed, Brazil is the world's fifth largest producer of waste, and produced an estimated 78.4 million tons of urban solid waste in 2017 (South Africa produced 42 million tonnes of general waste in 2017), with a waste collection coverage of 91.2% (Costa & Dias, 2020; Filho, 2014). The Brazilian per capita domestic waste generation rate is at 1.035 kg/c/day, and the monthly per capita cost of waste management operations is currently at R$10.37 (Costa & Dias, 2020).

Brazil, similarly to South Africa, still predominantly utilizes landfilling as a means of waste disposal. Efforts have been taken to eliminate the use of landfills, but over the past 10 years, only 47 (2.83%) municipalities have forgone the use of dumpsites, translating into a yearly reduction rate of merely 0.23% (Costa & Dias, 2020). Moreover, only 59% of the collected waste in the country was being disposed of in landfill facilities that are deemed satisfactory (sanitary landfills) (Costa & Dias, 2020). The remaining collected 41% of waste was disposed of at inadequate landfill sites (dumpsites and the like) (Costa & Dias, 2020; Filho, 2014). An estimated 7 million tons were disposed of at unknown destinations (Costa & Dias, 2020). Additionally, 3 352 municipalities, of the country's total 5 470, direct their waste to improper facilities (Costa & Dias, 2020).

However, some progress has been documented, and as a result of several open dumps being shut down, controlled landfills have been increasing due to the need of these unfit waste sites to receive remedial attention. Landfilling remains an inadequate solution from a socio-environmental perspective; however, it is deemed more acceptable than to dispose of municipal solid waste in open dumpsites, as the pollution generated is, at the very least, localized (ABRELPE, 2016; Sindicato das Empresas de Limpeza Urbana no Estado de São Paulo (SELUR), 2014). Nonetheless, with few radical initiatives in place, Brazil loses approximately R$2.5

billion annually due to recyclable waste being inappropriately disposed of in landfills (Instituto de Pesquisa Economica Aplicada (IPEA), 2010).

3.4.2.3 Waste management policy and regulation

This section reports on the legislative policy landscape that has resulted in the current state and management of waste within Brazil and South Africa. In order to determine in which areas there are possible opportunities to change problematic or less than adequate policies, it is essential to gain an in-depth understanding of these policies and the framework that envelops them.

Within South Africa, the past 30 years have seen an extensive framework develop, a fully detailed account of which would be immense. Instead, the key milestones that have impacted on the waste sector the most will be highlighted. Currently, all spheres of the South African government are legally obligated to oversee waste management (DEA, 2011a). However, the DEA has been assigned as the lead agency for waste management-related functions (DEA, 2011a). Other national departments with some waste-related responsibilities include the Department of Water and Sanitation (DWS) (responsible for the protection of water resources), the Department of Mineral Resources (DMR) (responsible for the management of mining waste), the Department of Health (sets regulations for medical waste and treatment facilities), the Department of Agriculture, Forestry and Fisheries (DAFF) (sets the guidelines for all agricultural waste), the DoE (repurposing waste as alternative energy), and COGTA (responsible for municipal service delivery and addressing service backlogs) (DEA, 2011a). As could be seen with most other green economic policies, which were highlighted within Article 1 of this dissertation, the number of responsible departments for waste management is fairly large within South Africa. The apparent lack of coordination within South Africa's waste sector might well be attributed to the multitude of government departments involved within the sector, which remain fundamentally fragmented and operate in isolation. This could prove a useful avenue for further research.

South Africa's first attempt at governing the disposal of waste was undertaken in 1989, with the formulation of the Environmental Conservation Act (ECA) (DEA, 2018; Godfrey & Oelofse, 2017). The ECA promulgated that any waste facility should be classified as a disposal site, which necessitated the obtainment of a Section 20(1)

ECA permit (DEA, 2018). The ECA, however, did not purport to encourage any effort to minimize, control or repurpose waste (Godfrey & Oelofse, 2017). After a decade of stagnant waste management policy and technological progress, the establishment of the 1998 NEMA replaced the largely unsuccessful ECA, and an enhanced legal framework developed that encouraged non-landfill waste technologies (DEA, 2018). Eventually, prompted by the guiding principles of the NEMA, a waste-specific environmental management act was established, the 2008 National Environmental Management: Waste Act (NEM:WA) (DEA, 2018; UN-DESA, 2010). The formulation of this Act was received with great optimism at the time, as it encapsulated great prospects for environmentally sound waste management (UN-DESA, 2000). This Act seeks to comprehensively regulate waste management in a proactive manner and supports the waste hierarchy principles, which is regarded as a best practice waste management approach, internationally (DEA, 2018). The NEM:WA further stipulates that all waste management activity be licensed through an integrated environmental impact assessment (EIA) process (DEA, 2018). Since the NEM:WA was South Africa's first regulatory measure in terms of waste management specifically, several glaring issues and shortcomings quickly became apparent within the following years, leading to the establishment of the National Environmental Management: Waste Amendment Act (NEM:WAA) in 2014, the inauguration of which opened up many more opportunities for the recycling industry (DEA, 2018).

Since the establishment of both the NEM:WA and NEM:WAA, much progress has been made with regard to waste management governance and the development of non-landfill disposal technologies (DEA, 2018; Godfrey & Oelofse, 2017). The National Waste Information Regulations (NWIR) were adopted in 2012, ensuring the collection of valuable data and information on South Africa's waste management systems, which are able to inform important waste management policy decisions (DEA, 2018). The execution and enforcement of the NWIR remain mostly passive, however, as no stringent consequences have been stipulated in the absence of reporting from generators, recyclers, exporters, and disposers of waste (DEA, 2018). Soon after the establishment of the NWIR, the Waste Classification and Management Regulations were promulgated in 2013, which stipulated the norms and standards of the disposal of waste to landfill sites (DEA, 2018).

Moreover, the following key long-term plans and strategies were developed, intermittently, to address certain prominent issues with waste management within the country: the Integrated Waste Management Plan (IWMP) and the National Waste Management Strategy (NWMS) (DEA, 2018; Godfrey & Oelofse, 2017). The IWMP provides all spheres of government with the necessary tools to assist in properly planning and managing waste, whereas the main goal of the NWMS is to uphold the objectives of the NEM:WA (DEA, 2018). Additionally, economic instruments have been established which are based on the 'polluter pays principle' of the NEMA. This principle states that the generators (households and businesses) of waste should be held responsible for the costs involved in managing waste (DEA, 2018). The success of this strategy, however, is debatable as waste services within South Africa remain under-priced (DEA, 2018).

Within Brazil, the National Policy on the Environment (PNMA) was established in 1981, the Law on Public Consortia (LCP) in 2005, and the National Policy on Basic Sanitation (PNSB) in 2007 (Lima, Firmo, Lucena, Mariano, Jucá & Lima, 2014). The establishment of these laws at the time did not explicitly focus on waste management, but were instead meant to merely complement the country's municipal solid waste management (Lima *et al.,* 2014). Brazil's waste management policy and legislative framework developed more recently than South Africa's (and most other countries for that matter), and only established the National Policy on Solid Waste (NPSW)[26] in 2010 (Costa & Dias, 2020). The promulgation of the NPSW represented a key milestone for the management of waste within the country, as specific guidelines were introduced for the first time that enable integrated solid waste management, and set out specific duties for waste generations and public authority (Mannarino, Ferreira & Gandolla, 2016). Moreover, the goals of this law are based on the waste hierarchy (the same as South Africa's NEM:WA) and banned the unregulated disposal of waste, such as by open dumping (Alfaia *et al.,* 2017; Presidência da República, 2010). Municipalities at the time were also given a deadline of four years to close all open waste dumpsites, and instead dispose of waste in a manner considered environmentally acceptable (Alfaia *et al.,* 2017; Presidência da República, 2010). However, little progress has been initiated, as the majority of waste is still destined for inappropriate waste disposal sites (Alfaia *et al.,*

26 The NPSW can also be referred to as the National Solid Waste Policy (PNRS).

2017; Maier & Oliveira, 2014; SELUR, 2014). This is largely due to various pertinent issues surrounding the application of the NPSW; for example, Brazilian municipalities (particularly smaller ones) lack the proper institutional capacity and management skills, whilst also lacking an adequate financial capacity to comply with the proper waste rules and regulations (Heber & Silva, 2014; Lima *et al.,* 2014).

Some studies (Costa & Dias, 2020; Lima *et al.,* 2014) have noted the influential effect that other developed countries' current waste strategies have had on the formulation of the NPSW. Although this influence could provide the Brazilian waste management framework with much-needed guidance on best-practice regulations, the country's economic, political, financial, social and structural specificities have to be accounted for when formulating policies that are likely to influence the country's socioeconomic conditions and community concerns (Costa & Dias, 2020). These issues relate to a prominent concern currently present in both countries: the informal sector's involvement within waste management practices, which will be discussed in the section below.

3.4.2.4 Role of the informal sector in waste management practices

As a result of both countries' current susceptibility to widespread poverty, unemployment and inequality, a large, active informal sector has emerged (which is common in developing nations), that has taken it upon itself to enter the waste management sector. The informal recycling sector collects and handles large amounts of waste, which would otherwise have been collected and disposed of by the responsible local municipal authorities (Wilson *et al.,* 2012). The initial emergence of these waste reclaimers was mainly due to fact that both South Africa and Brazil lacked formal recycling programmes and household waste separation facilities (South Africa is still severely lacking in these) (Gutberlet, 2016; Blaauw, Viljoen, Schenck and Swart, 2015). Additionally, rural, informal settlements within developing countries are often neglected in terms of waste collection services and sanitary provisions; residents are thus forced to act themselves to ensure the cleanliness of their environment (Gutberlet, 2016). In most cases, however, waste reclaimers are incentivized to collect and recycle waste as a means of earning a living (although they earn a pittance in many instances), given that job opportunities within both countries, especially South Africa, remain scarce and often necessitate

formalized educational backgrounds or critical skills (Alfaia *et al.,* 2017). The contribution of these waste reclaimers within both countries is immense, as their work assists in the recovery and recycling of vast amounts of waste (Gutberlet, 2016).

3.4.3 Brazil's informal waste sector

Although the country's waste management policy framework is still in its infancy, Brazil's organized informal recycling sector is particularly impressive, and can act as an estimable example on how to change the current status-quo regarding those waste management systems and policies in South Africa, which are fundamentally unsustainable (Gutberlet, 2016). Brazil is often distinguished as being one of the world's most progressive countries in recognizing the importance of the informal sector in solid waste management systems (Gutberlet, 2016, 2015; Dias, 2011). In Brazil's case, methods such as conscientization and community-based initiatives have been widely effective in enhancing waste practices (Gutberlet, 2016). Moreover, having realized the importance these workers, waste reclaimers (referred to as catadores, catadoras or carrinheiros in Brazil) within the country are officially recognized as constituting a vital profession, and are integrated into the waste management system and the national economy (Alfaia *et al.,* 2017; Gutberlet, 2015; Wilson *et al.,* 2012). The country has a long history of high commitment to institutional development in the solid waste area (Wilson *et al.,* 2012); thus, its waste management practices can be insightful and valuable for South African waste management policymakers.

In Brazil, waste reclaimers have organized as a nationwide social grassroots movement to support their struggle to improve their precarious working conditions and pitiful wages (Gutberlet, 2015). As a result, Brazilian municipalities have become more involved in selective solid waste collection schemes with these recycling cooperatives (Compromisso Empresarial Para Reciclagem (CEMPRE), 2014). Approximately half of the municipalities in Brazil with selective waste collection already work with cooperatives (CEMPRE, 2014). Additionally, the Brazilian government has pledged its support for the organization of waste reclaimers and has put in place structures and legislative and subsidy measures to support the initiatives of the social and solidarity economy (Caruana & Srnec, 2013). The recycling

cooperatives benefit most from these provisions, and in some cases are offered training and capacity building by the government and non-governmental organizations (NGOs) (Lemaitre & Helmsing, 2012). These cooperatives are invaluable within the country as they perform essential selective-waste collection services, involve municipalities and industries, and further the circular economy (Gutberlet *et al*., 2017).

3.4.3.1 The city of Belo Horizonte: A practical integrated waste management example

At the national, state and municipal levels in Brazil, there has been a strong commitment to socially include all citizens (Dias, 2011). The city of Belo Horizonte, however, is a particularly pertinent example of how inclusive and sound waste management practices, coupled with strong municipal planning, can assist in incorporating informal waste reclaimers into the waste sector narrative, and the many benefits that ensue (Dias, 2011). As the city became extremely populous and fast-growing, it was soon recognized that greater waste management initiatives would have to be undertaken in order to prevent dire socioeconomic and environmental concerns from arising (Cannon, Thorpe & Emili, 2020). As such, an integrated solid waste management model was adopted in 1993 that prompted households/businesses to segregate waste at the source (Dias, 2011). This system eventually, and exponentially, enhanced existing operations at the city's landfills. It resulted in a recycling programme for construction waste; initiated the composting of organic material; introduced environmental education; and resulted in the improvement of working conditions for waste sweepers and collectors (Dias, 2011). The city has also instituted legislation which stipulates that social inclusion, recycling, job creation, and income generation represent the four main pillars of its solid waste management system (Dias, 2011).

Moreover, the city's Public Cleansing Agency (SLU), recognizing the duality of the issue of ever-increasing waste generation rates and waste reclaimers' need for greater involvement, instated a clause declaring all collections and sales of recyclables to be contracted solely by waste reclaimers, thereby legalizing their role in the system and protecting their activities (Cannon *et al.,* 2020). The official integrated recycling system in the city recovers recyclable waste through three main

methods: door-to door collection, the drop-off system, and curb-side separated collection (Dias, 2011). The most recent assessment determined that in 2008, 5 100 tons of recyclables were collected through door-to door collection (52% of all collected recyclables), 1 300 tons were collected through the drop-off system (13% of all collected recyclables in the city), and 3 900 tons were collected through the curb-side system (Dias, 2011).

The first cooperative to have formed in Belo Horizonte, the Association of Collectors of Paper, Cardboard and Reusable Material (ASMARE), is one of particular significance (Cannon *et al.,* 2020). Waste reclaimers who are part of this cooperative now work in a semi-formal environment, and as a result, workers are empowered and their working and living conditions have improved a great deal (Cannon *et al.,* 2020). Great progress has been made since its establishment, having gained a formal role in policymaking and ownership of several recycling facilities (Cannon *et al.,* 2020). Several key provisions by the city ensure its continued success: a monthly salary for administrative costs, infrastructure for use by the waste reclaimers (containers and storerooms for sorting and storing purposes), vehicles for the collection of recyclables (carts and the like), and environmental education (Cannon *et al.,* 2020). In turn, ASMARE is responsible for managing the recycling warehouses, sorting and valuing the recyclable materials, and providing the city with information on recycling production (Cannon *et al.,* 2020). ASMARE also provides administrative and management support to all its members (Cannon *et al.,* 2020). Moreover, ASMARE and 22 other cooperatives have united to form a network, dubbed the Cataunidos, thus strengthening the waste reclaimers' negotiating ability even further (Cannon *et al.,* 2020). Because of the combined efforts of ASMARE and Cataunidos, waste reclaimers have gained a collective identity, greater self-confidence, and pride in what they do for a living, which is an important, yet often overlooked, component in the workplace. Additionally, waste reclaimers in cooperatives have been found to earn USD321 a month, on average, which is 40% higher than the national minimum wage of USD228 (Sabatino, 2017).

3.4.3.2 The importance of Brazil's informal waste economy

By the most recent published estimates, there are currently 600 cooperatives and other associations active throughout Brazil (Gutberlet, 2015). Moreover, 698

recycling enterprises have been documented by the latest IPEA (2013) study, with a total of 21 164 workers, 39% of whom are women. There are conflicting accounts of the numbers of waste reclaimers currently active within Brazil, likely due to the high turnover rate and often unregulated nature of the profession. The study by MNCR (2012) placed them at around 800 000; the study by Besen (2008) estimated an amount of 500 000 waste reclaimers, and Crivellari, Dias and Pena's (2008) study placed it instead at around 230 000. Regardless of the exact number of reclaimers, it is clear that their numbers are high and that they play a massively important role in the country. Indeed, Brazil saves around R$1.4 to R$3.3 billion a year under recent recycling rates, produced mainly by the efforts of the country's waste reclaimers (Gutberlet, 2015).

However, if all recyclables within the country were recovered, this amount would substantially increase to R$8 billion a year (IPEA, 2010). On the premise of this example, it becomes clear that the potential collaboration between cities and the informal waste sector would be exceedingly beneficial for both parties in South Africa, and should thus be an urgently pursued political priority. It presents a major opportunity for developing countries in general, and for South Africa in particular, to increase recycling rates, enhance and protect citizens' livelihoods, address the negative effects that current informal recycling practices have on the environment and human health, and reduce the costs associated with managing and disposing of waste.

3.4.4 South Africa's informal waste sector

In stark contrast to Brazil's inclusive waste management approach, South Africa's waste management framework does not welcome inclusivity or facilitate a community-based approach, although some progress has been made to accommodate some of the needs of reclaimers. Lobbying by the South African Waste Pickers' Association (SAWPA) resulted in the Waste Bill of 2007, designed to enable reclaimers to enter landfill sites to salvage materials (Sekhwela & Samson, 2020). The 2011 National Waste Management Strategy (NWMS) and the National Environment Management Act, 59 of 2008, (NEMA) acknowledges the important role that waste collection and recycling plays within impoverished communities. However, these informal workers remain unrecognized by most national and local waste

policies, strategies and legislation (Schenck *et al.,* 2016). The NWMS also includes provisions to allow reclaimers to be integrated within municipal waste management systems, although merely allowing waste reclaimers on to disposal sites does not always suggest recognition, especially without any other means of support or integration into other vital decision-making structures or proper management of landfill facilities (Sekhwela & Samson, 2020; Schenck *et al.,* 2016). Presently, waste reclaimers within the country are excluded from the formal waste management narrative, and South African informal waste reclaimers continue to operate without proper equipment, in precarious working conditions, for a very low and fluctuating wage.

3.4.4.1 The importance of South Africa's informal waste economy

Although disregarded within waste management planning, the prevalence of the informal economy within the waste sector greatly contributes towards diverting waste away from landfills and increasing recycling efforts, the economic savings of which are immense (Sekhwela & Samson, 2020; DEA, 2018). Indeed, the current recycling economy within South Africa is occasionally considered to be on par with some other developed countries, mainly due to informal waste reclaimers' high recycling levels (Godfrey & Oelofse, 2017). Approximately 80–90% (by weight) of recyclable paper and packaging is collected by the informal sector, saving local municipalities between R309.2 and R748.8 million in landfill space costs alone (Godfrey, Strydom & Phukubye, 2016). However, recovering 100% of all waste streams with a high recycling potential holds the possibility for unlocking resources worth R25.2 billion per year into the economy, which would otherwise have been diverted to landfills (Godfrey, Vozza & Mohamed, 2016). As was mentioned previously, Brazil saves a far larger amount per year, at around R$1.4 to R$3.3 billion (Gutberlet, 2015). Certainly, the fact that Brazil's population is far greater than South Africa's, and therefore generates larger amounts of recyclable waste, is an important consideration. However, it remains important to improve waste management policies in South Africa, as the recycling industry can unlock an immense amount of profit within the country, thus leading to the generation and redistribution of income and hence poverty reduction.

Currently, an estimated total of 60 000 to 90 000 waste reclaimers are active in South Africa, an amount that is most likely grossly under-estimated, as these informal workers are unregistered and unregulated (Samson, 2020; Godfrey & Oelofse, 2017; Schenck *et al.,* 2016). The study by Godfrey and Oelofse (2017) postulates that there could be as many as 215 000 waste reclaimers in South Africa, if one assumes that informal waste reclaimers account for an estimated 0.6% of the urban population (Linzner & Lange, 2013). Clearly, the exclusion of waste reclaimers within the waste management sector represents a missed opportunity to create green jobs within South Africa, as these workers are very active and dynamic, and are spurred on by basic survival necessities (DEA, 2018). Integrating informal workers into formalized waste collection and recycling strategies would not only increase these workers' qualities of life and provide a sense of job security, but would also incentivize higher collection and recycling levels.

Additionally, the exclusion of the informal sector from the country's waste management framework means that the contribution of the informal sector is not reported in waste data statistics, thus greatly affecting the reliability of waste data reported (Rodseth *et al.,* 2020). This leads to waste management practices being inaccurately represented, which is an issue of particular importance in South Africa, given that great disparities are present in the provision of formal waste services across South African households (Rodseth *et al.,* 2020).

Moreover, unregulated waste management practices could potentially carry adverse environmental and social repercussions, the impacts of which are thus likely to be underestimated due to a lack of proper representation. In order to assess the magnitude of the problem that unregulated waste activity presents, it is important to be able to identify and quantify such activity so that the appropriate mitigation action might be pursued (Rodseth *et al.,* 2020). Unregulated waste activity could include illegal open dumping, the operation of illegal dumpsites, uncontrolled burning, and unlicensed landfills (Rodseth *et al.,* 2020). Such practices have a high potential for waste leakage and severely contaminating the environment. However, the challenge of data availability and reliability is not only limited to informal waste practices; data particulars regarding formal waste management are also often inconsistent and unreliable (DEA, 2012).

3.4.4.2 Current waste management initiatives

It is to be noted, however, that some efforts have been recorded. Currently, the waste economy provides 35 000 formal jobs within South Africa (DEA, undated). The current GDP contribution of the waste sector is 0.62%, although the 10-year Waste Research, Development and Innovation Roadmap has set the goal of growing the current contribution of the waste sector to reach 1–1.5% of GDP by 2023 (DEA, undated). A national initiative designed to fast track the chemical and waste economy has also been established, entitled Operation Phakisa (DEA, 2018). The main goal of this initiative is to increase the contribution of the chemicals and waste economy to the country's GDP and to job creation (DEA, 2018). This initiative aims to enhance and facilitate the effective implementation of priority programmes by setting clear procedures and targets, monitoring progress, and publicly announcing these results (DEA, 2018).

Moreover, cooperatives have been promoted by the South African government as a means of formalizing the work that waste reclaimers do, thereby stimulating and creating low-entry employment opportunities and developing the enterprise (Godfrey & Oelofse, 2017). Initiatives such as the Food for Waste and Separation at Source Projects and the Vukuzenzele and Nkoza Drop-off and Sorting Cooperative Pilot Project have been implemented thus far. However, most cooperatives have not been successful, with a discouraging failure rate of 91.8% (DTI, 2011).

Numerous challenges plague the formulation of successful cooperatives within the country, primarily a lack of basic infrastructure such as transport, equipment, and sorting/storage premises. Other operational and capacity challenges have also been identified as hampering the implementation process (Godfrey & Oelofse, 2017). Nonetheless, although many problems currently exist that inhibit the effective establishing of cooperatives in South Africa, the fact that these cooperatives exist might present beneficial opportunities in that cooperatives do not need to be created from scratch. This then presents itself as a way to get these cooperatives to function better in a network of integrated institutions, rather than having to both create them *and* integrate them.

3.4.5 Concluding discussion

From the above comparative study, it is evident that several similarities exist between South African and Brazilian waste management practices. Both countries' waste generation rates are disproportionately high when compared with other developing countries, although Brazil's generation rate far surpasses South Africa's (Costa & Dias, 2020; Filho, 2014; UN-DESA, 2010). Both countries' waste management practices experience incredible pressures in urban municipalities particularly, as these areas are constantly developing and experience frequent flurries of domestic and international migration, thereby increasing the population density immensely (DEA, 2018; World Bank, 2016b). Rural areas within both countries also experience difficulties in waste management, as waste services within these regions are generally of a very low-standard or practically non-existent (Gutberlet, 2016; Stats SA, 2016). Consequently, the mismanagement of waste is a pressing concern in both countries, leading to increased pollution rates and environmental degradation, dire living conditions for those residing in rural areas or areas near waste disposal sites or treatment plants, and a lack of diverting waste into valuable resources. The lack of extensive recycling in both countries not only further strains the waste sector's financial position, but also represents a great loss in potential profits and employment prospects. These are very significant losses for both countries, considering their current deprived state of economic and socioeconomic development.

Both countries' main means of waste disposal continues to be landfilling, which is an unsustainable and inefficient disposal method that does not enable the proper establishment of superior waste removal and recycling technologies (Godfrey & Oelofse, 2017). A legislative framework pertaining specifically to the management of waste has been slow to develop for both countries, with South Africa only establishing a waste-specific, environmental management Act in 2008 (the NEM:WA) and Brazil only establishing its first waste management policy in 2010, with the promulgation of the NPSW (DEA, 2018; Costa & Dias, 2020). South Africa has developed many more subsequent policies, regulations, norms, and standards, whereas Brazil's policy framework has stagnated for the most part. However, the establishment of a range of waste management policies within South Africa has not

effectively led to any substantial changes in the methods by which the country disposes of waste and utilizes recyclable waste. Although the South African recycling economy is constantly growing, with the amount of packaging materials collected for recycling growing from 1930.2 tonnes in 2012 to 2215.1 tonnes in 2016, it remains uncertain how waste reclaimers are going to be better positioned within this growing sector of the economy in order to further promote sustainable and inclusive waste practices (Sekhwela & Samson, 2020). The concluding section below presents some recommendations, drawing from the insights of Brazil's informal waste sector integration practices that, although not without their own hurdles and challenges, far triumph over those of South Africa.

3.5 RECOMMENDATIONS AND CONCLUSIONS

The presence of the informal sector within South Africa's waste management practices is an inevitable outcome of a wide range of persistent socioeconomic and socio-environmental issues within the country. From the above case study analysis, it is evident that the potential cooperation between local municipalities and the informal waste sector would be exceedingly beneficial for all involved parties, and should thus be an urgently pursued as a political priority. It represents a major opportunity for South Africa to increase its recycling rates, enhance and protect citizens' livelihoods, address the negative effects that current informal recycling practices have on the environment and human health, and reduce the costs associated with managing and disposing of waste. Although these imperatives and benefits exist in incorporating the informal economy into waste management perspectives and strategies, little initiative has been taken to realize such a mutual association, and informal waste reclaimers remain excluded from participating in the waste management sector as a validated, consulted participant (Schenck *et al.,* 2016). The prioritization of sustainable, inclusive waste management strategies in South Africa is negligible, and remains uncoordinated and poorly funded (Makgae, 2011). In comparison to those of Brazil, South African waste policies are not doing enough to ensure green growth, notwithstanding that this article has found that there are numerous opportunities for the adopted application of Brazil's waste management policies.

Drawing from the insights garnered from Brazil's inclusive waste management strategies, integrating waste reclaimers within the waste sector should be done through various steps. As in the case of Brazil, the formalization of the work done by reclaimers as a recognized employment opportunity should certainly be included as the first step (Sekhwela & Samson, 2020). Thereafter, fundamental consideration should be given to the precarious working conditions, safety and existing methods of waste salvaging that greatly need to be improved upon (Kashyap & Visvanathan, 2014). Improving access to recyclables, for example, can be done by means of the three highly efficient methods used in Brazil: door-to-door collection, the drop-off system, and the curb-side separated collection approach.

Ensuring this access, however, should be done by means of stringent policy and legislation. Although once merely considered to follow a temporary profession, waste reclaimers now comprise a permanent and important feature of the informal economy and the recycling industry within South Africa. Hence, it is imperative to review current waste planning priorities and incorporate the necessary changes in order to place waste reclaimers firmly within the waste sector's short - and long-term objectives (Schenck *et al.,* 2016). This will once more legitimize waste reclaimers' work, establish them as vital stakeholders, and enable the government to support and work alongside them (Kashyap & Visvanathan, 2014; Ahmed & Ali, 2004). The role played by the informal sector in South Africa's waste management system, however, must be researched in far more depth than it has been thus far, and these findings should be utilized to inform policy discussions.

The integration of the informal economy into the waste narrative is not an easy task, considering the various policy challenges it creates around the livelihoods, norms and standards that need to be addressed in the context of the political imperatives for radical economic and socioeconomic transformation that coexist alongside sustainable development, whilst at the same time increasing the rates of recycling within the country (DEA, 2019). Moreover, it is imperative that policies and initiatives be informed not only by facts and figures, but also by the input from the waste reclaimers in the country (Godfrey, Vozza & Mohamed, 2016; Ezeah, Fazakerley & Roberts, 2013; Velis, Wilson, Rocca, Smith, Mavropoulos & Cheeseman, 2012). In doing so, policies and strategies can be tailored to provide waste reclaimers with the sufficient support, resources, recognition and dignity they need (Schenck *et al.,*

2016). This process, as was seen in the case of Brazil, focuses on empowering and capacitating waste reclaimers, which Blaauw *et al.* (2015) maintain is central to the integration process.

Another pivotal step, as demonstrated by the example of the city of Belo Horizonte, is initiating the process of institutionalization, i.e. establishing cooperatives and associations of waste reclaimers (Godfrey, Vozza & Mohamed, 2016; Kashyap & Visvanathan 2014). The earliest waste reclaimer movements in Brazil encompassed cooperatives, and this was seen to be a widely successful approach, even within densely populated, urban areas (Dias, 2011; Medina, 2007). This step is imperative to ensure that municipalities and companies are able to engage with a collective, thus greatly simplifying the contracting process. In addition to encouraging empowerment, cooperatives allow waste reclaimers to have more negotiating power: higher prices are secured by selling collectively, thus allowing reclaimers to move up the value chain (Cannon *et al.,* 2020). Waste reclaimers should also be sufficiently trained and allowed to be co-responsible for the waste management of cities and towns, alongside their relevant municipalities.

Naturally, these recommendations are reliant on many country-specific factors, and need to be mindful of achieving both environmental justice and social justice. Although recycling cooperatives have proven to be more effective in Brazil than its official waste management strategies (Gutberlet, 2008), there are many considerations to be aware of within South Africa before such a strategy could be implemented. Recycling cooperatives, for example, could provide the country with significant income opportunities; however, these collectives have had a failure rate of 91.8% thus far, despite fairly low barriers to entry (Godfrey, Strydom & Phukubye, 2016). This initiative can only be successful if they are supported by the necessary start-up funds and capital, and if the waste reclaimers themselves are in agreement with this particular strategy (Blaauw *et al.,* 2015). Moreover, the development of management skills and dedicated, long-term mentoring is pertinent, given the poorly capacitated levels of human capital within the country (Blaauw *et al.,* 2015). Investments by external stakeholders (public and private) and access to markets, amongst many other complex conditional factors, are crucial (Godfrey, Strydom & Phukubye, 2016). Within Brazil, the coordination between different levels of government, NGOs and the waste reclaimers themselves has been streamlined

(Gutberlet, 2008). Within South Africa, however, such coordination is currently very limited, which is an issue that would need to be resolved to enable cooperatives to create lasting employment opportunities (Blaauw *et al.,* 2015).

Waste management in South Africa certainly faces numerous complex challenges: a vastly growing population, limited waste management facilities, inadequate provision of waste services for rural areas, scant community-based recycling initiative and participation, and a policy and regulatory environment that does not actively promote the waste management hierarchy – to name only a few (DEA, 2011b). Therefore, at a more practical level, this article concludes by suggesting that integration processes should be initiated alongside input from waste reclaimers. A collective understanding and consensus must be reached on the methods of integration that will be most appropriate and beneficial towards both the waste reclaimers and the waste sector, all the while acknowledging the inherent challenges in doing so, particularly in the context of deeply unequal power relations between reclaimers and waste officials. These sorts of recommendations would ensure that more is being done to ensure green growth through green economic policies in South Africa.

The lessons learnt from Brazil's informal waste sector are contingent on a plethora of factors, all of which significantly complicate the issue of establishing inclusive, yet sustainable, waste management. Nevertheless, policymakers must not be deterred – never before has it been of such importance to establish a safe and stable environment that is conducive for waste minimization, repurposing, recycling and recovery businesses to develop and prosper. The current climate crisis and ever-increasing pollution rates within the country, coupled with worrying unemployment rates and chronic poverty, should present a major incentive to policymakers within South Africa to look to other countries' best practices in waste management, and radically tailor these to fit to the country's socioeconomic and environmental demands. Brazil's integrated waste management sector is most certainly a good point at which to start.

CHAPTER 4:
OVERALL CONCLUDING REMARKS AND AREAS FOR FURTHER RESEARCH

South Africa's current economic growth model is deeply unsustainable, as it relies predominantly on resource- and energy-intensive industries, thus aggravating pressures on the environment and worsening the climate crisis at large. Internationally, the transition to a green economy, stemming from the concept of sustainable development, has been recognized as the ground-breaking way forward. South Africa is in a unique position to utilize its renewable resources abundance (solar and wind, mostly) at a time when the global emergence of green economic development is gaining traction (Montmasson-Clair, 2012). In order to gain a complete understanding of the progress that South Africa is making in transitioning towards a green economy, a more holistic and, integrally, a more unified understanding of the fractured economic policy space is required. The main aim of this dissertation was therefore to determine the scope and depth of green economic policies in South Africa. In doing so, two articles were undertaken, both pursuing different aims in order to adequately answer the research question in hand.

The first article mapped and critically analysed green economic policy research that has been undertaken within a South African context. This review provides a platform for enhancing the integration of diverse green economic policy studies. Although the review determined that the scope of South Africa's green economic policy framework is relatively large, containing numerous promising strategies for a sound, albeit slow, green economic transition, the depth of these policies is questionable, as little implementation has been enacted thus far. Additionally, the sheer scope of green economic policies (though commendable), as well as the numerous formal institutions (governmental departments and organizations) involved, was found to severely inhibit policy coordination and integration. Unsurprisingly, therefore, the review found South Africa's green economic transition to be progressing slowly and somewhat arbitrarily.

The prominent international discourse around economic growth (in essence an informal institution, as this culture of accumulating at all costs has continued to expand) has created hegemony over other development paths (Bond, 2002). However, green growth has been gaining in prominence (although there is still a long

way to go) so as to show the necessity of incorporating a more sustainable development path. A country fraught with socioeconomic difficulties, such as South Africa, necessitates a green economic transition that encompasses an inclusive, integrated approach. Within the green growth narrative, however, not much consideration is given to facilitating such an approach, as this dissertation has shown. Indeed many strategies make such a transition entirely unconducive to proceeding. This can clearly be seen by countless green growth strategies that fail to address community concerns, to include the marginalized into the narrative, or to include the growing informal economy, which thus far has been increasingly active within sustainable waste management practices – which the second article addresses (Sekhwela & Samson, 2020; DEA, 2018).

Article 2 consisted of a comparative case study analysis, comparing South Africa's waste management framework to that of Brazil in order to gain a better understanding of best practices in the context of integrating the informal economy into waste management policies and initiatives. South Africa's informal economy was found to be large and growing, with waste reclaimers being a large part of the narrative. The work done by waste reclaimers is immense and greatly facilitates a recycling economy within the country, thus promoting waste management practices that are more sustainable (Sekhwela & Samson, 2020). The case study analysis found that the potential cooperation between local municipalities and the informal waste sector would result in not only 'greening' the waste sector to some extent, but would also be conducive towards integrating a large portion of marginalized, impoverished citizens into the green trajectory, thus greatly facilitating inclusivity. However, little initiative has been taken to realize such a beneficial association, and it remains an overlooked political priority. Overall, the prioritization of sustainable, inclusive waste management strategies in South Africa was found to be trivial, and remains uncoordinated and poorly funded.

After critically analysing Brazil's integrated waste management sector, many insights were garnered that would be exceedingly beneficial if implemented within the South African waste management sphere. Firstly, formalizing waste reclaimers' work as a recognized profession is pivotal, and secondly, reclaimers' access to recyclables needs to be enhanced in order to improve their dire working conditions. Thirdly, current waste policies and planning priorities need to be updated to include the

informal economy. These policies, however, should be informed by the needs of the waste reclaimers in order to provide them with adequate support. This is a pivotal step as it will assist in establishing waste reclaimers as legitimate and vital stakeholders, and enable the state to support and work alongside them. Fourthly, and finally, Brazil's case study demonstrated that the establishment of institutions, such as recycling cooperatives and other associations, is paramount to the integration of the informal economy into municipalities' waste management practices.

These insights, however, were found to be contingent on a range of country-specific factors that need to be kept in mind before such integration would possibly be successful. The integration of the informal economy into the waste narrative is not an easy task, considering the various policy challenges it creates around the livelihoods, norms and standards (which are indeed the informal institutions) that need to be addressed in the context of the political imperatives for radical economic and socioeconomic transformation that coexists alongside sustainable development, whilst at the same time increasing the rates of recycling within the country (DEA, 2019). Furthermore, it is also of vital importance to enhance the standing of some informal institutions, such as by alleviating the perceived negative judgment passed on waste reclaimers and their salvaging profession, which is often considered to be a 'substandard' occupation. Environmental education would be helpful in this regard. Nonetheless, Brazil's integrated approach to waste management offers valuable and practical guidance for the South African waste sector.

A green economy within South Africa should encompass a transition that leads to greater resource-efficiency, decarbonisation and conservation, and also one that elevates redistributive measures that are able to promote inclusivity and social welfare. Both articles, however, found South Africa's green economic trajectory to be severely lacking in such an approach, mainly due to institutions that are unable to launch a coordinated implementation of green growth policies. In summary, in answer to the overall research question of "What is the scope and depth of South Africa's green economic policies?" this dissertation found that although the scope of green economic policies within the country is inordinately large, the depth of - and level of commitment to - these policies are severely lacking. Moreover, South Africa's green economy thus far encapsulates flawed neoclassical, market-based solutions, and therefore holds little value in decreasing social inequality or encouraging

sustainability (Brown *et al.,* 2014). This is illustrated by the absolute lack of policies, and policy research, on integrating marginalised South Africans such as waste reclaimers into the green economy narrative. Formal institutions, such as the government, the various departments responsible for green economic policy (the DEA, for example) and the private sector, have allowed the lure of powerful and superior political institutions and economic institutions to govern and dominate the green economy policy narrative, thus far.

This dissertation has further revealed that some areas of research are pivotal within the green economic policy realm. Firstly, research is required to determine how best to navigate the intricate relationship between establishing a green economy, whilst simultaneously encouraging socioeconomic opportunities, thus promoting and facilitating inclusivity and poverty reduction. Secondly, further research should be undertaken into the current challenges surrounding green economic policy formulation and implementation within South Africa. However, such research should be coupled with analysing the nature and true intent behind these green economic policies, and which green economic discourse it perpetuates. Thirdly, on a more granular level, further research is required to learn how best to incorporate social and political facets to the debate about waste management. Additionally, a quantitative approach that endeavours to measure the impacts of these green economic policies could be beneficial within this research area (for example, attempting to isolate whether or not these policies are having a reduction in CO_2 emissions). Finally, an institutional analysis to better understand why there is a lack of implementation of these policies is also an important potential area of further research. Semi-structured interviews with key policymakers, for example, would be useful.

Since the advent of its democracy, the South African government has promulgated neoliberal policies, projects and laws that have continuously failed to dispel the high accounts of poverty and inequality within South Africa, and have only further perpetuated several socioeconomic problems within the country (Chandrashekeran *et al.*, 2017; Death, 2014a; Death, 2014b; Cock, 2014; Bond, 2002). Unfortunately, this ideation has also infiltrated South Africa's green economic policy sphere, and illustrates the elite's unyielding macro-political route – neoliberalism disguised by sustainable-development rhetoric (Bond, 2002). As such, the green economic policy

framework within South Africa has steadily deteriorated into a substandard, inefficient form of international reformism. A green economic movement that is not built upon the Global North's neoliberal ideologies should be initiated, being one that is applicable and sensitive to South Africa's inherited, post-apartheid environmental challenges and socioeconomic struggles, whilst maintaining a sense of urgency regarding the mitigation of the climate crisis. The need for comprehensive and integrated green economic policy in South Africa has never been more urgent.

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Appendix 1: Reviewed pieces of literature

Study No.	Author/s	Main theme identified	Key sub-theme identified	Other possible sub-themes
1	AFRICEGE, 2015	Enthusiastic	Promotes socioeconomic development	Enables a low-carbon transition
2	Averchenkova, Gannon & Curran, 2019	Apprehensive	Policy incoherence	
3	Baker, 2017	Apprehensive	Dependency on brown development	
4	Baloyi & Masinga, 2010	Enthusiastic	Enables a low-carbon transition	
5	Borel-Saladin & Turok, 2013b	Enthusiastic	Promotes socioeconomic development	
6	Bray, 1999	Enthusiastic	Comprehensive green framework	
7	Burton *et al.,* 2019	Apprehensive	Dependency on brown development	
8	Chandrashekeran *et al.,* 2017	Apprehensive	Policy implementation challenges	Commodification of nature
9	Cloete, 2018	Apprehensive	Policy Incoherence	
10	Cock, 2014	Apprehensive	Commodification of nature	
11	DEA, 2014	Apprehensive	Policy implementation challenges	
12	DEA, 2015	Apprehensive	Policy Incoherence	
13	Death, 2014a	Apprehensive	Commodification of nature	
14	Death, 2014b	Apprehensive	Commodification of nature	Policy implementation challenges
15	DoE, NT & DBSA,	Enthusiastic	Enables a low-carbon	

	2017		transition	
16	Earthlife Africa, 2009	Apprehensive	Dependency on brown development	Policy Implementation challenges
17	Eberhard, Kolker & Leigland, 2014	Enthusiastic	Enables a low-carbon transition	
18	Fakir, S. 1997	Apprehensive	Policy incoherence	Policy implementation Challenges
19	Faling *et al.,* 2012	Apprehensive	Policy implementation challenges	Policy incoherence
20	GEC, 2018	Apprehensive	Dependency on brown development	Lack of integrating the informal economy
21	Gilder, 2012	Apprehensive	Policy incoherence	
22	Giordano, 2014	Apprehensive	Policy incoherence	
23	Giordano, Hall, Gilder & Parramon, 2011	Apprehensive	Policy incoherence	
24	Godfrey & Oelofse, 2017	Apprehensive	Lack of integrating the informal economy	
25	Godfrey *et al.,* 2017	Apprehensive	Lack of integrating the informal economy	
26	Hamann, Booth & O'Riordan, 2000	Apprehensive	Policy implementation challenges	
27	Iroegbu et al., 2020	Apprehensive	Policy implementation challenges	
28	Kaggwa *et al.,* 2013	Apprehensive	Dependency on brown development	
29	Kalumba et al., 2017	Apprehensive	Policy incoherence	
30	Klausbruckner, 2016	Apprehensive	Policy incoherence	
31	Kotzé, 2006	Apprehensive	Policy incoherence	
32	Kotzé, Nel, du Plessis & Snyman, 2007	Apprehensive	Policy incoherence	

33	Leigland & Eberhard, 2018	Apprehensive	Dependency on brown development	
34	Leonard, 2018	Apprehensive	Commodification of nature	
35	Mauger & Barnard, 2018	Apprehensive	Policy incoherence	
36	Montmasson-Clair, 2012	Enthusiastic	Promotes socioeconomic development	
37	Moyo, 2015	Apprehensive	Policy implementation challenges	
38	Musango, Swilling & Wakeford, 2016	Apprehensive	Policy implementation challenges	Commodification of nature
39	Never, 2011	Apprehensive	Policy incoherence	
40	Nhamo & Mukonza, 2018	Enthusiastic	Enables a low-carbon transition	
41	Nhamo & Mukonza, 2016	Enthusiastic	Enables a low-carbon transition	
42	Nhamo, 2013	Apprehensive	Policy incoherence	
43	Odeku & Meyer, 2010	Enthusiastic	Enables a low-carbon transition	Comprehensive green framework
44	PAGE, 2017	Enthusiastic	Comprehensive green framework	Enables a low-carbon transition/Promotes socioeconomic development
45	Rabie, 1999	Enthusiastic	Comprehensive green framework	
46	Rennkamp, 2019	Apprehensive	Policy implementation challenges	Policy incoherence
47	Rossouw & Wiseman, 2004	Apprehensive	Policy implementation challenges	
48	Smit & Musango, 2015a	Apprehensive	Lack of integrating the informal economy	

49	Smit & Musango, 2015b	Apprehensive	Lack of integrating the informal economy	
50	Szewczuk, 2012	Enthusiastic	Enables a low-carbon transition	Comprehensive green framework
51	Trollip & Boulle, 2017	Apprehensive	Policy implementation challenges	
52	Tyler & Gunfaus, 2015	Apprehensive	Policy implementation challenges	
53	Van Heerden *et al.,* 2006	Enthusiastic	Enables a low-carbon transition	
54	World Bank, 2016	Enthusiastic	Enables a low-carbon transition	

Source: Author's own framework