UNIVERSITY OF KWAZULU-NATAL

INFORMING CLIMATE CHANGE MITIGATION POLICY: AN ETHEKWINI MUNICIPALITY PERSPECTIVE

By

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DECLARATION

I, Magashen. K. Naidoo, declare that

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To anyone that I may have missed, that omission was not intentional, a hearty thank you.

Dedication

This dissertation is simply dedicated to the fight against the negative aspects of climate change.

Glossary

ACMVD	African Cassava Mosaic Virus Disease
AI	Appreciative Inquiry
ANC	African National Congress
AR	Action Research
BRICS	Brazil, Russia, India, China, South Africa
CAS	Complex Adaptive Systems
CCP	Cities for Climate Protection
CCS	Carbon Capture and Storage
CFL	Compact Fluorescent Light
CO2	Carbon Dioxide
CO2e	Carbon Dioxide equivalent
DA	Democratic Alliance
DCCS	Durban Climate Change Strategy
DEA	Department of Environmental Affairs
DoE	Department of Energy
EXCO	Executive Committee
GDP	Gross Domestic Product
GHGEI	Greenhouse Gas Emissions Inventory
GWP	Global Warming Potential
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HS&I	Human Settlements and Infrastructure
ICLEI	International Council for Local Environmental Initiatives
IDP	Integrated Development Plan

IFP	Inkatha Freedom Party
IPCC	International Panel on Climate Change
LED	Light Emitting Diode
LTDF	Long Term Development Framework
MDGs	Millennium Development Goals
MEC	Member of Executive Committee
MF	Minority Front
MFMA	Municipal Finance Management Act
NDP	National Development Plan
NEES	National Energy Efficiency Strategy
OD	Organisation Development
PPM	Parts Per Million
SIP	Strategic Integrated Project
SMEs	Small and Medium Enterprises
TCO2e	Tons of Carbon Dioxide equivalent
UK	United Kingdom
UN	United Nations
UNEP	United Nations Environmental Programme
UNFCCC	United National Framework Convention on Climate Change
USA	United States of America
WMO	World Meteorological Organisation

Abstract

This research focuses on Climate Change Mitigation policy at the local government level. It aims to discover how officials and politicians at the eThekwini Municipality comprehend and make policy decisions in the Climate Change Mitigation field. Thereafter, Complex Adaptive System (CAS) theory will be incorporated into the research to answer the key research questions. Finally, the research will utilise an Organisation Development (OD) approach to hypothesise a manner in which CAS thinking can be embedded in local government.

Climate Change Mitigation is, fundamentally, concerned with the reduction of greenhouse gas emissions by anthropogenic activities. This can be achieved by either reducing the amount of greenhouse gas emissions that are caused by human activity or by creating sinks that can capture greenhouse gases. Should the level of carbon dioxide (CO_2) continue to increase, a resulting increase in the temperature of the plant will result. This will have serious consequences for life as we know it. This research is important because Climate Change Mitigation is a relatively new focus for municipalities in South Africa, including eThekwini Municipality. The traditional mental models for conceptualising the world and any problems will not be adequate for addressing Climate Change Mitigation issues.

The key research questions that this research sets out to answer are:
1. What are the perceptions of municipal officials and politicians of inconsistent and conflicting national, provincial and local laws impact on service delivery in the area of Climate Change Mitigation?
2. What is the status quo of the Climate Change Mitigation area?
3. What are the current levels of understanding and ways in which Climate Change Mitigation policy is formulated?
4. In what way can applying CAS thinking in local government help improve the formulation of policies in the Climate Change Mitigation area?
5. How can OD assist with embedding CAS thinking in local government?

The research will rest on Social Constructivism, while focusing on Qualitative data only. The Case study methodology has been selected as the strategy of inquiry. For practical purposes the population of this research has been limited to eThekwini Municipality officials and politicians. Interviews will be utilised to gather the primary, qualitative data.

More often than not, when there are serious problems that government is trying to address the knee-jerk reaction is the formulation of turn-around strategies. While the intent of government is good, the same thinking that got government into trouble is used to create the potential solution. A new approach and mental model for government is needed for the formulation of solutions.

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Chapter One: Introduction

Introduction

Mankind has always been confronted with situations that not only threaten our existence but also tests our resilience and moral values. These situations range from World War II to Apartheid and the War on Terror, to name a few. The scale of the impacts and manner in which mankind is effected has varied. As time proceeds and the world becomes a more integrated place the complexities of the situations that arise will also increase. The aspects of a war that happened in the 10th century will likely be less intricate than a war that happens in the 21st century, however, the fundamentals will remain the same. Climate change caused by anthropogenic activities, and climate change at large, is precisely one of those far reaching situations or occurrences. The consequences of climate change are more far reaching than any challenge mankind has faced. As a result of this, to adequately respond to climate change will undoubtedly encompass and require input from a large number of heterogeneous stakeholders. The vast number of stakeholders will contribute, in part, to climate change being classified as a complex issue. This is not only from a scientific stand point but from a holistic point of view, which should incorporate all perspectives.

As the world becomes a more complex place, it is necessary that our ability to understand our environments is maintained. When the world was a simple place, simple mental models for framing the world in which we lived sufficed. However, as the complexity of our environments increase, our mental models have to become more sophisticated. This is necessary to enable us to be able to understand the complex and adaptive nature of most of our environments or systems. The field of systems theory, specifically Complex Adaptive Systems (CAS), can be put forth as such a mental model. This is in contrast to the well subscribed models of reductionist and mechanistic thinking. While CAS is discussed in the subsequent chapters, it is fundamentally a system that has the ability to learn and adapt to any stimuli that has an effect on a system.

A situation that is as huge and overarching as climate change will naturally require concerted attention from government. In addition, with the growing importance of decentralised operations, it is important that local governments develop the necessary platforms and skills with which climate change can be addressed. One of the key platforms is local government policy, from which government actions are directed and guided. This research, therefore, aims to utilise CAS in order to create more robust and effective Climate Change Mitigation policy; fundamentally the key findings should be able to be extrapolated into other areas of local government policy.

The following sections of this chapter aim to provide an explanation of what climate change actually is and the history of climate change. It will also contextualise the setting of the research by briefly discussing the eThekwini Municipality. This is in order to create a context within which the

key research questions can be framed and answered. The later part of this chapter then highlights some strategic aspects of this research.

Background

The issue of climate change is not a new one. The first publication dates back to 1842, where a French national outlined the greenhouse warming occurrence (Rahman, 2012). However, in recent times it has been gaining an increased amount of prominence in the media, in research papers, in the political agenda and in civil society such as Greenpeace. Climate change is a phenomenon that is affected by a wide array of sources which include natural causes such as volcanoes and anthropogenic causes (Kanaskar, et al., 2013). Anthropogenic causes range from burning of fossils fuels to methane emissions from landfills and are emissions caused by human activities (Kanaskar, et al., 2013). While the effects of climate change are not desirable; it can create various opportunities or innovate new practices (Republic of South Africa (RSA), 2011). On the other hand climate change also poses the single largest ecological conundrum with a plethora of severe consequences (Kanaskar, et al., 2013; Granberg & Elander, 2007).

"Climate change in IPCC usage refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time period" (Intergovernmental Panel on Climate Change, (IPCC), 2007, p. 30).

Climate change can be addressed through two broad sub-elements. These are Climate Change Mitigation and Climate Change Adaptation. Climate Change Mitigation can be conceptualised as an activity or activities which can be undertaken in two ways. The first is to decrease the amount of anthropogenic carbon dioxide (CO_2) and carbon dioxide equivalents (CO_2e) that are emitted into the earth's atmosphere. The second way in which to carry out a Climate Change Mitigation activity is to create a carbon sink. This is a mechanism that is created to increase the rate of which CO_2 and CO_2e are sequestrated from the atmosphere (Bassett & Shandas, 2010). The technologies can range from tree planting to complicated carbon capture and storage (CCS) technologies. On the other hand, Climate Change Adaptation seeks to minimise and mitigate the impact of climate change (Granberg & Elander, 2007). These activities range from protection against flooding to

putting measures in place to limit the impacts of declining air quality and increases in storms, cyclones and hurricanes.

It will be prudent, at this stage, to clarify the difference between CO2 and CO2e. CO2 refers to the gas which has two oxygen atoms and one carbon atom. It is one of the gases emitted as a result of any combustion. The reporting of greenhouse gases and Greenhouse Gas Emission Inventories (GHGEI) is undertaken in CO2e because CO2 is not the only greenhouse gas that is emitted into the atmosphere. However it is the most abundant. All other gases such as methane and nitrous oxide, amongst others, are not as abundantly emitted as CO2. However, some of the gases are more harmful to the environment than CO2. Those gases are given a Global Warming Potential (GWP), according to a specific time period, which is then used to make all greenhouse gases equivalent to CO2. For instance, with a 100 year span CO2 has a GWP of 1, methane has a GWP of 21 and sulphur hexafluoride has a GWP of 23,900 (IPCC, 2005). This means that they are 21 times and 23,900 times, respectively, more dangerous to the atmosphere than CO2.

There have been major noticeable changes in the climate of the earth dating back to antiquity. These range from the humid conditions that the dinosaurs existed in during the late Triassic period, through the Jurassic period until the ultimate demise of the dinosaurs in the cretaceous period and from the glacial temperatures that mammoths thrived in during the Pliocene through to the Holocene periods. The current climate change however has seen groups put forward arguments that support and contend that anthropogenic activities have a marked impact on climate change (Rahman, 2012). Much of the current carbon emissions have been initiated by the Industrial Revolution that began in the early 1900's in the United States of America (USA). The Industrial Revolution fundamentally created many of the processes and innovations that drove and drives the thirst for energy, which is primarily powered by finite and environmentally harmful fossil fuels. The Industrial Revolution saw the rapid expansion of many industries, for various reasons, without consideration of its ramifications on the environment. However, as indicated in the following section of this chapter, environmentally conscious organisations and the general train of thought only arose in the late twentieth century.

Essentially every activity that human beings undertake in their daily lives, no matter how insignificant that activity might seem, results in the emission of pollutants into the atmosphere. A basic daily human action such as flushing the toilet will result in the substances that are flushed processed by energy hungry wastewater treatment plants. Every kilometre that we commute, even in a fuel efficient automobile, will result in approximate 90 grams to 140 grams of CO2e per kilometre being emitted into the atmosphere. That is not taking into account the emissions that resulted from the refining and transportation of the fuel to the fuel station where the fuel was bought. The seven billion population mark of the Earth was surpassed in 2011 and the figure is

estimated to rise to nine billion by 2050 (United Nations Population Fund (UNFPA), 2012). Taking those population increases into account, the discharge of pollutants will undoubtedly rise. This is of course unless drastic and effective changes and policies and implemented now.

As previously mentioned, climate change presents both threats and opportunities that will virtually affect every generation to come. The threats might seem insignificant now. However, once they start manifesting themselves in ways that distress us will the ramifications of climate change be fully understood. These manifestations are already presenting themselves in sea level rise, change of weather patterns, droughts, and the change of climate zones. Sea level rise is as a result of the increase temperature melting ice caps and glaciers (Obeysekera & Park, 2013); currently there are numerous countries with coastal areas that face relocation as one of the adaptation strategies to respond to sea level rise (IPCC, 2007). It has been estimated that the sea level could rise by 3.7 meters, at current increases of CO_2e being emitted by the end of this century. Furthermore, if all the ice contained in Greenland melts it can contribute approximately 7m in sea level rise (IPCC, 2007). Changes in weather patterns and increases in natural disasters have also started to show their ferocity. The USA has recorded the most active Atlantic hurricane season in 2005 and that year also included the worst hurricane in the USA since 1928 (Beven, et. al., 2008). Droughts have the potential to initiate forced migrations, which will strain areas with water and other supplies further perpetuating problems (IPCC, 2007). Durban can be used as an example for climate zone change. Currently, Durban has as a sub-tropical climate; however there is a risk that the temperature and humidity could increase (eThekwini Municipality, 2012). This will increase the increase the probability that Durban will become a malaria area. If the seriousness of climate change has still not been be articulated well, it is definitely worth mentioning that Durban can anticipate an increase of between 3 to 5 degrees Celsius by the 22nd century (eThekwini Municipality, 2012).

While the threats briefly discussed above will culminate in severe consequences for life as we know it, the issue of climate change also presents certain opportunities. These opportunities range from spurring on new low carbon industries to eco-tourism. The new industries would create technologies and services that result in lower carbon emission per capita for the same or an increase in the standard of living. The high unemployment rates can potentially also be reduced as a result of new industries and have positive impacts on the economy. These industries can range from the installation of Solar Water Heaters to the highly technical manufacturing process of Photovoltaic panels. While there are threats to the health of individuals as a result of climate changes, there are also benefits for their health. One such example is not using motorised transport, such as internal combustion engine automobiles. By not utilising such automobiles or public transport and by utilising a bicycle instead the greenhouse gas emissions are completely negated and health levels will increase. The contribution of the transportation sector to the eThekwini

Municipality greenhouse gas emissions accounts for a massive 37% of all emissions that are made by the Municipality and from within its' jurisdictional boundaries (eThekwini Municipality, 2013a). The transportation sector is one of the key sectors that offer substantial prospects to decrease the greenhouse gases of the eThekwini Municipality.

Climate Change Mitigation Context

International Policy Context

The subsequent paragraphs aim to outline the history of international strategic efforts undertaken, to date, against climate change. They are discussed briefly and largely in chronological order. It is important to note that the following paragraphs detail only agreements, protocols, programmes and organisations that set the platform for advocating, collaborating and driving the agenda for various activities in the Climate Change Mitigation and Climate Change Adaptation areas. While the specific activities and projects are important, it is out of the scope of this section of the dissertation to delve into individual activities or projects. The discussion and summary of the activities of the organisations below do etch a broad understanding of the international driving forces that influence the South African government. While key international stakeholders, other than national governments, contribute to or direct the efforts in South Africa against climate change it should be noted that organisations not directly involved in climate change can also have a profound effect on the area. An example of such an organisation is the World Trade Organisation. However, all of these international stakeholders to a large degree have an effect on which path or paths the South African government will pursue with regards to broad plans and specific activities to combat climate change. Naturally, the provinces and municipalities in South Africa will have to dovetail into such plans and become innovative in order to create beneficial programmes for its particular locality and own needs.

The elementary United Nations (UN) charter was first penned during 1944 in Washington, DC, USA. However the first sitting of the UN only took place in mid-1945 (Schlichtmann, 2010). Currently it is primarily responsible for advocating and fostering global collaboration amongst States across the world. It also spans numerous disciplines, including peace efforts. The reason that the UN is considered important in and for this dissertation is because it has become the world authority on all issues that are of an international nature; climate change being one of the key examples. The founding of the UN, in a time when climate change was not on the agenda show great foresight by its founders and enabled the UN with the necessary mandates to adapt to situations as they arise and address them accordingly.

Another key stakeholder is the World Meteorological Organisation (WMO) which is a sub-organisation of the UN. It was established in 1950, with the focus of climatology, weather and

hydrology (Zillman, 2009). The WMO later on in its life played key roles on establishing bodies that are focused solely on climate change; this will be discussed in the upcoming paragraphs.

The United Nations Environment Programme (UNEP) was established in 1972, and is based in Kenya. It is primarily tasked with supporting the activities of developing countries in environmental policies and practices. UNEP should be considered as more of a programme, rather than a sub-organisation of the UN (United Nations Environment Programme (UNEP), 2006).

A milestone in the fight against climate change was the first World Climate Conference that took place in 1979 in Geneva, Switzerland. It is regarded to be one of the first world-wide conferences that held global warming and research as its primary focus. However, the conference was primarily attended by the scientific community. This conference in many ways set the foundations for subsequent organisations and conferences that sought to deal with issues of climate changes (Zillman, 2009).

The International Panel on Climate Change (IPCC) was founded in 1988 (Carter, 2008) by the WMO and UNEP. The IPCC's primary responsibility included determining whether anthropogenic greenhouse gas emissions might be a catalyst for climate change; this was over and above the ecological factors (Carter, 2008). The IPCC plays a critical role in creating and providing technical information. The organisation has compiled numerous assessment reports and special reports by their various working groups; which set the foundation for further efforts of many other stakeholders across the planet.

An important organisation, especially in supporting cities, is the International Council for Local Environmental Initiatives (ICLEI) which was founded in 1990, but only began its activities a year later in 1991. ICLEI aims to support local governments, through a number of their programmes. They advocate that cities or local government's actions and decisions impact the entire world. ICLEI, therefore, actively promotes city action for sustainability. The organisation also assists cities in a number of varying disciplines, with the aim of having happy and healthy communities. (International Council for Local Environmental Initiatives (ICLEI), 1993). ICLEI has a membership base of over 950 cities throughout the world, which includes eThekwini Municipality, and has developed a number of tools for use by cities. The eThekwini Municipality's 2011 reporting of greenhouse gas emissions is based on two protocols developed by the ICLEI (eThekwini Municipality, 2013a).

Another subsidiary of the UN is the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC was established in 1992 at the Rio Earth Summit but only came into power two years later in 1994. The UNFCCC aims to cap the increase of the temperature of the planet by alleviating the increase of carbon emissions and climate change. It also endeavours to

guarantee and facilitate on a global magnitude, the principle of sustainable development and food growing safety measures (Antigua Country Review, 2013). It is through the UNFCCC that agreements such as the Kyoto protocol have been agreed upon.

The Kyoto Protocol is the first worldwide pact that aims to subdue carbon emissions of participating nations. The protocol takes cognisance of the fact that the large majority of anthropogenic emissions can be credited to the 'Developed Nations' and therefore has stipulated a greater liability on those nations in reducing carbon emissions. The pact came into being in 1997 in Kyoto, Japan. However, the details of the Kyoto Protocol was only discussed and agreed upon in 2001, which saw the Kyoto Protocol coming to the fore in 2005. The first round of commitments began in 2008 and ended in 2012. The second round as agreed upon in the 18th Conference of the Parties. The Doha amendment was voted in favour of. The primary constructs of the amendment was a second round of commitments, from the Kyoto Protocol, that would start in 2013 and end in 2020. First world or developed nations should compensate poorer nations who bear the wrath of climate change (Antigua Country Review, 2013).

Another Key agreement that was made by UN member nations is the Millennium Development Goals (MDGs) in 2000. The MDGs aim to achieve specific goals by the year 2015. These goals number eight and span a variety of disciplines from Aids to Education (Aleyomi & IseOlorunkanmi, 2012). According to Aleyomi & IseOlorunkanmi (2012), the MDGs are as follows:

1. Eradicate extreme poverty and hunger;
2. Achieve universal primary education;
3. Promote gender equality and empower women;
4. Reduce child mortality;
5. Improve maternal health;
6. Combat Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS), Malaria, and other diseases;
7. Ensure environmental sustainability; and
8. Develop a global partnership for development (National and Local Context).

National and Local Policy Context

South Africa was one of the original fifty one founding members of the United Nations (UN) in the year 1945. However, due to the apartheid regime, South Africa was suspended from the UN General Assembly in November of 1974. It was only during 1994 after the abolishment of Apartheid that all sanctions and suspensions against South Africa were lifted (Kagwanja, 2008).

South Africa participates in and is directed by a throng of organisations, programmes, pacts strategies and goals for climate change. Thus far, South Africa has made relatively good progress towards ensuring a sustainable future. A number of national Ministries have actively taken up the fight against climate change. However, due to the backlog of certain basic services the pursuit of a climate friendly country is hindered. According to The Presidency of the Republic of South Africa, Department: Performance Monitoring and Evaluation, (2012); the South African government priorities are:

1. Education and Skills;
2. Health;
3. Fighting Crime and Corruption;
4. Jobs;
5. Economic Infrastructure;
6. Rural Development;
7. Human Settlements;
8. Local Government and Basic Services (Water, Sanitation, Refuse removal and Electricity);
9. Environmental Assets and Natural Resources;
10. Creating a better South Africa and contributing to a better and safer Africa in a better World; and
11. An effective, efficient and development oriented Public Service.

In 2010, the Department of Minerals and Energy, under the mandate of the president, underwent a reorganisation. The Ministry was reorganised into two unique Ministries; to each deal with energy (the Department of Energy (DoE)) and mineral and mining (the Department of Mineral Resources). The mandate of the DoE is to, *"Ensure secure and sustainable provision of Energy for socio-economic development"* (Department of Energy, 2012, p 12). The vision for the department in the year 2025 is, *"Improving our energy mix by having 30% of clean energy by 2025"* (Department of Energy, 2012, p 12). The legislative decree to the DoE as per the Acts of South Africa includes the National Environmental Management Act, No 107 of 1999; which is primarily responsible for reducing carbon emissions, promoting energy efficiency and decreasing the impact of the provision of energy on the environment (Department of Energy, 2012). Another key Act among many Acts, which has direct relevance for this dissertation, is the National Energy Act, No. 34 of 2008. The crux of the Act is that it delegated power to the DoE to*, "ensure that diverse energy resources are available in sustainable quantities and at affordable prices in the South African economy to support economic growth and poverty alleviation, while also taking into account environmental considerations. In addition, the Act also provides for energy planning, for the increased generation and consumption of renewable energy, contingency energy supply, the holding of strategic energy*

feedstock and carriers, adequate investment in appropriate upkeep and access to energy infrastructure, measures for the furnishing of certain data and information regarding energy demand, supply and generation, establish an institution to be responsible for the promotion of efficient generation and consumption of energy and energy research and all matters connected therewith" (Department of Energy, 2012, p 15).

Furthermore, an important document is the White Paper on Renewable Energy of 2003 which builds on a previous White Paper, the White paper on Energy Policy. The White Paper on Renewable Energy of 2003 sets forth the current governments manifesto with regards to advocating and executing Renewable Energy sources. The White Paper also indicates the plan through which the objectives will be achieved and highlights the way in which other governmental bodies can follow suit (Department of Energy, 2012). In addition the National Energy Efficiency Strategy (NEES) is currently being developed by the DoE.

Another Ministry in the Republic of South Africa that must be mentioned, in a little detail, is the Department of Environmental Affairs (DEA); however it does play a lesser role than the DoE in Climate Change Mitigation. The vision of the department is, *"A prosperous and equitable society living in harmony with our natural resources"* (Department of Environmental Affairs (DEA), 2013, p10). Their mission is, *"providing leadership in environmental management, conservation and protection towards sustainability for the benefit of South Africans and the Global Community"* (Department of Environmental Affairs (DEA), 2013, p 10).

The White Paper on Climate Change Response of 2011 is fundamentally directed at both Mitigation and Adaptation activities. This is because the White Paper has in effect two aims. The first is to manage and respond to climate change, this tackles the socio-economic front as well as an emergency response stance. The second aim is to contribute to the international effort to cap harmful gases being emitted into the atmosphere by anthropogenic activities (Department of Environmental Affairs (DEA), 2013).

Eskom is a parastatal of the South African government and the primary electricity supplier in the country. Its generation capacity is largely dependent on coal with only a small percentage coming from sources other than coal. Due to various reasons and the strain on the national electricity grid due to a high demand and a limited supply potential; Eskom has undertaken many programmes and projects in recent years to utilize Renewable Energy technologies like solar water heaters and energy efficient products, like CFL bulbs, LED bulbs, low flow shower heads and geyser timers (Eskom, 2012).

An important programme of the South African government and Eskom, in pursuit of renewable energy and greenhouse gas reductions, is the Independent Power Producers programme. The

government aims that between 2010 and 2030 all of the total electricity generation should include at least 11, 4 GW of electricity from Renewable Energy sources. (Department of Energy (DoE), 2011). The third phase of the tendering process is currently underway.

There are many more documents that include plans, programmes and strategies in South Africa that have an impact on Climate Change Mitigation. These include the following: National Development Plan (NDP); National Programme of Action; National Spatial Development Plan; Strategic Integrated Projects (SIP); Presidential State of Nation Address; Provincial Growth and Development Strategy; and the Provincial Spatial Economic Development Strategy.

At the local level, or ground zero, the eThekwini Municipality has a Long Term Development Framework (LTDF). This framework aims to ensure that sustainability becomes part of the way the municipality operates and influences the Integrated Development Plan in a similar manner (eThekwini Municipality, 2012). In terms of the Municipal Systems Act 32 of 2000, section 16 (1) (a) (i), a municipality is mandated to create an Integrated Development Plan to strategically direct the functioning of the Municipality. The eThekwini Municipality has an Integrated Development Plan (IDP), with Climate Change Mitigation appearing in Plan 8, which has the following goal, *"To maximise the Municipality's financial resources to ensure long term financial viability and sustainability" (*eThekwini Municipality, 2012, p 12). In addition to the municipal IDP, the eThekwini Municipality also has an Energy Strategy that was formulated in 2008. The Strategy sets out objectives and broad plans for attaining certain goals. The strategy broadly covers four themes or area, which are: residential sector; local authority and public sector; industrial, commercial and agribusiness sector; and the transport sector (eThekwini Municipality, 2008).

Currently the eThekwini Municipality is developing the Durban Climate Change Strategy (DCCS) that aims to tackle the issues of both mitigation and adaptation and provide a reference for everyone in eThekwini Municipality to work towards.

The quantification of greenhouse gases being emitted by the eThekwini Municipality and by the community within its boundaries is important because it *"will aid policy makers in forecasting emission trends, identifying the point and mobile sources of emissions generated, and setting goals for future reductions and mitigation"* (eThekwini Municipality, 2013a, p 1). For the 2011 calendar year, the eThekwini Municipality emitted a total of 27,649,400 tCO2e (eThekwini Municipality, 2013a).

In an ideal world the international policies and agreements, which South Africa subscribes to, will influence the Country's national policies and strategies. These national policies and strategies should then be interpreted and used as a basis to create provincial specific policies and strategies that will bear fruits for the provincial government but at the same time assist in contributing to goals set by national government. Furthermore, those provincial policies and strategies need to be interpreted by the municipalities, who have a very difficult job as they are the closet level of government to the people and the level of government in which tangible aspects of service delivery are seen. It is up to the municipalities to create policies that would enable it to achieve a number of conflicting goals. However, should there be a deviation from this change which is a top-down approach, it can result in unauthorised policies and if widespread can result in very divergent results from what national government set out to achieve.

EThekwini Municipality Overview

South Africa is located on the southern part of the African continent. According to the latest national census, the country has a diverse population of just over 52,000,000. The country is classified as a developing country and is part of the recently formed BRICS coalition; which is an acronym for Brazil, Russia, India, China and South Africa. South Africa is 19 years into democracy. The first democratic election, where all its citizens could vote was held in 1994. That monumental election brought an end to Apartheid, when the African National Conference (ANC) won the election. The constitution of South Africa was born in 1996, and is widely considered to be one of the finest constitutions in the world. According to the Minister of Finance, in his 2013 Annual National Budget Speech, it is expected that the South Africa Gross Domestic Product (GDP) will grow by 2,7% in 2013; he further mentioned that over the next three years government and parastatals have budgeted to spend R 827 billion on infrastructure projects.

While the country has a vast amount of first world nuances, there are still numerous third world problems that demand attention. There are eleven official languages and nine provinces. The north-eastern province, called KwaZulu-Natal, is a majestic place that contains warm beaches all year around, sunny skies, the regal Drakensburg mountains, is a melting pot of various cultures and has an enormous amount of the country's heritage vested in it. The political capital of KwaZulu-Natal is Pietermaritzburg, located in the Msunduzi Municipality. However, the province's economic powerhouse is undoubtedly the eThekwini Municipality, which contains the well-known city of Durban. EThekwini Municipality accounted for 65,5% of the province's GDP eThekwini Municipality, (2012). The Municipality's jurisdiction covers an area of 2,297km², that can be classified as 36% rural area and 29% per-urban area.

In the annual Mayor's speech, a budget for the eThekwini Municipality with a capital budget of R 5.4 billion and an operating budget of R 28.3 billion was earmarked for the 2013/2014 financial year. The Municipality's financial year starts at the 1st of July and ends on the 30th June. The Municipality has a population of 3,442,361 (STATSSA, 2011). Furthermore, it had a GDP of R 206.9 billion for 2012, and it is projected that the figure will increase to R 223.2 billion in 2013 (eThekwini Municipality, 2013b). Unemployment within the municipality's boundary has been reported at 20.4% (eThekwini Municipality, 2013b). The Gini Coefficient, which measures the distribution of wealth, is currently at 0.61 in 2011 (eThekwini Municipality, 2013b).

The eThekwini Municipality is categorised as a Metropolitan Municipality. The leadership of the municipality can be categorised into the political governance and the administrative management. The political cohort is elected every 5 years, with the next election to be held in 2016. The ruling political party in the eThekwini Municipality is the ANC, with minority representation by the Democratic Alliance (DA), Minority Front (MF), and the Inkatha Freedom Party (IFP) to name a few.

The administrative management of the municipality is divided into 7 clusters; with a number of units reporting directly to the City Manager who heads the administrative wing. Each unit comprises differing functions and budgets, with the largest cluster being the Human Settlements and Infrastructure cluster (HS&I) (eThekwini Municipality, 2013b). The total number of employees in the Municipality, during 2012, was 22 644 (eThekwini Municipality, 2013a). Employees of the eThekwini Municipality range from drivers and messengers to chartered accountants and scientists. The Municipality is in a fortunate position, in part due to its large rate payers base, in that it is one of a very few municipalities that have substantial financial resources at its disposal to implement various innovative and leading projects for the benefit of the populace. Another result of those financial resources, which should be considered to be one of the critical cornerstones on which the municipality has been built, is that the City is able to attract the correct skilled and technical experts in which to direct and manage the municipality to ensure that it is sustainable on all fronts. Those financial resources also enable the municipality to pursue unfunded-mandates, in order to bring additional facilities and services to its residents, an example of one of the municipality's unfunded mandates are the Libraries (eThekwini Municipality, 2013b). A bone of contention for the municipality, however, is the Manase report. It was commissioned by the KwaZulu-Natal Member of Executive Committees (MEC) of Cooperative Governance and Traditional Affairs. The report has made certain allegations, which the Municipality is currently investigating; about wide spread corruption by municipal officials and local, provincial and national politicians.

Problem Statement

This dissertation aims to uncover the manner in which officials and politicians at the eThekwini Municipality, in the sector of Climate Change Mitigation, comprehend and approach policy formulation and planning for and in the municipality.

It is planned that after the interviews have been completed, the findings will be viewed through a Complex Adaptive Systems (CAS) lens in order to determine if the respondents fully appreciate and acknowledge the relationship of variables within their environments. This will also be incorporated with the resulting information that emanates from policy formulation documents of the eThekwini Municipality.

The research also endeavours to determine what the perception of municipal policy makers are of all three spheres of government whose policies and laws have conflicting or contradictory objectives. An example of this is that a municipality might want to become a manufacturing hub, this is inherently an energy extensive industry which typically relies on fossil fuels, but at the same time the municipality wants to decrease its carbon footprint.

Although this research has been set forth to utilise CAS as a mechanism through which to view Climate Change Mitigation policy it endeavours to present the benefits in a manner that will lead to similar research utilising CAS in other areas that the municipality is mandated to be a custodian of.

The final objective of this dissertation will aim to provide a practical approach in which CAS can be implanted into the thinking of municipal officials and politicians. This will be accomplished by utilising Organisation Development (OD) to embed CAS in the municipality. This has been built into the research because it is good to demonstrate the benefits of CAS for the Municipality; however it is even better to ensure that all relevant people have this tool to comprehend the true complexity of their environments.

The aspects of the problem statement can be defined into five key research questions that will be answered during this research and is presented in the next section.

Key Research Questions

The following five questions have been identified as the key research questions that will be answered by this dissertation:

1. What are the perceptions of municipal officials and politicians of inconsistent and conflicting national, provincial and local laws impact on service delivery in the area of Climate Change Mitigation?
2. What is the status quo of the Climate Change Mitigation area?

3. What are the current levels of understanding and ways in which Climate Change Mitigation policy is formulated?

4. In what way can applying CAS thinking in local government help improve the formulation of policies in the Climate Change Mitigation area?

5. How can OD assist with embedding CAS thinking in local government?

Limitations of the Research

This research, as with most research, has a number of limitations. Some of these limitations are inherent, while others have been specifically imposed to ensure that the boundary of the research is realistic for the allocated time.

The identified limitations of this research are as follows:

1. The eThekwini Municipality is a Metropolitan Municipality in South Africa and the research will therefore not be entirely applicable to District or Local Municipalities in the country.

2. The research will also not be entire applicable to other Metropolitan Municipalities in the country, because a large part of the research has been evoked from individuals within the organisation. However, this would not be a limitation if the perceptions and views of officials from other Metropolitan Municipalities mirror that of eThekwini Municipality's officials and politicians.

3. The research does not claim to provide a panacea for effective Climate Change Mitigation policy; it merely aims to illustrate the benefits of CAS as a conceptual framework rather than reductionist and mechanist frameworks.

Assumptions of the Research

There have not been many assumptions made for this research because from a CAS perspective if assumptions are even marginally inaccurate it can lead to a huge discrepancy later on in the research. However, the emergence of assumptions was a matter of eventuality; therefore the following assumptions have been made for this research:

1. That the current thought process and approaches used by policy makers in the eThekwini Municipality to solve problems and formulate policy is reductionist and mechanistic.

2. That decisions which are made within the municipality are of short-term rather than long-term benefits and objectives. This is primarily due to the 5 year cycle in which political parties are voted for to hold office.

3. That the best decisions and policy for Climate Change Mitigation are not implemented or chosen; this is as a result of conflicting local, provincial and national government objectives and pressure form a number of varying stakeholders and lobbyists.

4. That traditional seats of power, influence and partnerships have started to shift and grow to include many new stakeholders.

Significance of the Research

This research is a modest attempt to advocate the benefits of CAS for municipalities in South Africa in the field of Climate Change Mitigation policy and policy at large. It also endeavours to highlight the benefits of widening the information from various agents of the system, in order to increase understanding of the problem. Due to the limited work on CAS in local government in South Africa and eThekwini Municipality; this research can be viewed as being part of the initial growing body of CAS research undertakings in the eThekwini Municipality. More importantly the research aims to contribute to the problem on the way in which CAS can be practically implemented.

Overview of Chapters

Chapter two of this research discusses peer reviewed journal articles that merge Complexity Theory with policy formulation and about CAS in general. The second section of chapter two discusses literature that broadly highlights the various areas of policy in a local government setting from research across the planet. The final section of chapter two briefly discusses prior research where OD has been used to embed CAS in an organisation. The third chapter will discuss the Research Methodology, which will include the research design. Chapter four will see the presentation of findings of the research undertaken; while chapter five will see an unbiased analysis of the results from the research. Chapter six will briefly present how OD can be utilised for embedding CAS in a local government context. The dissertation will culminate with chapter seven, which will provide the concluding remarks and recommendations for implementation and further research.

Conclusion

This initial chapter has provided an overview of the primary objectives of this research. The fundamental concept of climate change has been presented, along with the two broad ways in which it has to be addressed. In addition the history of climate change in the international arena and strategic activities to address it has been discussed in a very strategic and overarching manner. As the research will be undertaken in a context, it was extremely relevant that that content, the eThekwini Municipality, was briefly discussed. Finally, some of the fundamental of this research

were discussed; this includes the key research questions, assumptions and limitations. The next logical step in this research is for a thorough discussion of the existing academic literature of the relevant research areas. This will then enable this research to establish some legitimacy.

Chapter Two: Literature Review

Introduction

This chapter, the Literature Review chapter, chiefly aims to contribute to our current understanding of previous research in the fields of CAS, policy and Organisation Development (OD). This is needed and is important because the collective accumulation of knowledge in those areas have to be tapped into in order for a scientific basis to be formed and for new knowledge to be formed. The accumulated knowledge will then mould the thinking and the foundations will created in order to establish the markers within which the key questions can be authentically answered.

This chapter has been separated into three sections. This has been done to clearly indicate the difference between the discussions that occur in the different sections. The first section discusses publications that use CAS to analysis or understand various aspects of climate change policy in government. The second section then deals with publications that focus on policy, in relation to local government. The final section discusses OD at large and specifically the Appreciative Inquiry (AI) 4d-cycle in relation to embedding CAS in an organisation. While the discussions that occur in the sections are clearly defined, the impact on thinking that will be used as a basis to answer the key research questions.

It is important to note that there is a scarcity of literature that links CAS directly with Climate Change Mitigation policy. Therefore, for that reason the Literature Review of this dissertation will also focus on publications that tie together CAS and Systems Thinking in general with policy at a local government level in areas other Climate Change Mitigation.

In addition, there have been numerous pieces of research undertaken that looks into the various aspects that affect policy making, in general, and formulation in a local government context. However, those bits of research have no hint of CAS. As such, some of those publications will be discussed in their own right. Those aspects will be used with other mentioned literature in this dissertation to bring about a better understanding of the policy making system in local government in the area of Climate Change Mitigation.

In the last section of this chapter, literature in the region of OD will be briefly discussed. This is done to provide a theoretical underpinning for the hypothesis of embedding CAS in a local government environment.

The following is a definition of a Municipality, "*a town, city, or other small area, which has its own government to make decisions about local affairs, or the officials in that government*", (Pearson Education Limited, 2006, pg. 1006). While that definition is true, in a sense, the underlining thought miss a lot of the richness of what municipalities actually are. They are at heart

Complex Adaptive Systems and need to be treated as such but first the theory of CAS has to be understood. The following discussion of CAS will better provide some insights into why a municipality is a CAS. To provide a broad answer, however, a Municipality is a collection of varying components, both governmental and civil, that has a common want for a better city. The inherent structure of various components, that work towards the best for the Municipality but that have different perceptions, give rise to the unpredictable nature and dynamic composition of the system of municipality. All of those components have their own worldviews and ways in which to operate. In addition, they have the ability to learn and respond unpredictably to any stimuli. It is important to note that a single person cannot manage and direct that entire system; however it is frequently tried.

Complex Adaptive Systems Literature

Overview

CAS has its roots in natural sciences (Meek et al., 2007). CAS is an academic charter developed to assist academics and people at large to conceptualise the environments in which we live and comprehend the dynamic adaptive nature of social systems. The theory was developed at the Santa Fe Institute in the United States of America (USA), in the mid to late twentieth century by John H Holland in collaboration with a number of other academics.

Every system, by design, has a number or at least two components that interact with each other so that together they create the system and have a specific purpose. CAS is a type of system whereby, to our human understanding, the nature of these interactions between components and the system is unpredictable and dynamic. The word 'dynamic' should be interpreted in this context to mean that the components learn how to react and adjust to stimuli.

CAS can be further explained through the use of the following analogy. A simple system can be thought of as a computer that has a number of electronic components, these components all interact with each other in a manner that can be predicted to a high degree of accuracy. On the converse side of the continuum, a CAS can be thought of as a game (system) of monopoly where each player's (agent's) actions in turn influences the decisions and actions of the other players (agents), which can also affect the entire game (system) with the consequence of further influencing the players (agents) to change or adapt their behaviour.

In addition, CAS can also be explained by elaborating on some of its critical and fundamental characteristics. These characteristics are briefly mentioned and elaborated on below:

1.	Self-organisation: This characteristic advocates that any system that is complex and adaptive cannot be organised, managed or directed by a single constituent of a system.

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Therefore the systems manage and co-ordinates itself (Ellis, 2007), in an adaptive and responsive manner.

2. Co-evolution: As can be gleaned from the example of the Monopoly game above, as the entire system evolves the components or agents of the system evolves with the system. This is as a response to the system in the form of learning and adaptation. Furthermore, as an agent evolves and makes certain decisions, this can impact and change the system which would then have the implication of additionally affecting the agents' behaviour or decisions (Ellis, 2007).

3. Agents with schemata: One of the fundamental tenets of CAS is that all the agents of a system are unique and have different mental models with which to conceptualise and respond to any stimuli (Ellis, 2007). This, therefore, implies that any stimuli emitted by the system or another agent within the system will evoke an unpredicted response. The agent will also be in a constant state of evolution and learning.

4. Sensitive dependence: This characteristic has been presented for many years in the domain of Physics. When two projectiles are propelled with only a minute degree of difference in both projectiles trajectory, the outcome is that both projectiles could potentially end up thousands of kilometres apart. Basically, this characteristic states that even the smallest deviation or change can result in an amplified, divergent consequence later during or at the end of a process (Grus et al., 2010).

5. Path dependence: Path dependence advocates that the choices which are made by the agents of a system or organically by a system will influence the opportunities and threats that are available in the future. This can be further explained using the following example; when a student at Grade 10 is choosing his or her subjects for study in the following three years of their high school career, it will have an implication of what courses are available for the student to study at a tertiary institution.

6. History: This characteristic is closely linked to the preceding characteristic discussed. The history of any system will affect the agents and the system and will have resulted in them arriving at the present with any development, whether positive or negative (Holden, 2005). The Apartheid regime and it resulting laws and ways in which the country was developed can be used to explain some of the current problems, and advantages, that South Africa faces.

7. Emergence: This is one of the more profound concepts of CAS; it stipulates that when two or more parts interact it gives rise to something that would not have been possible without the interaction of the two or more parts (Lansing, 2003). Using climate change as an example and extrapolating very loosely for purposes of this example; when CO_2 is emitted by anthropogenic activities into the atmosphere it intermingles

with other gases and the sun's energy in our atmosphere which gives rise to higher temperatures and natural disasters.

8. Fitness Landscape: This is best explained through the use of an analogy; the skyline of New York City is literally littered with skyscrapers, some taller than others. If an organisation, figuratively speaking, occupies one of those skyscrapers they will not be able to jump from one peak to the next. There has to be some stimuli that brings about change and forces an organisation to move a few floors down. This, in turn, causes a reaction by the firm that it needs to improve. The improvement will in turn lead the organisation to reach the next peak (Lansing, 2003).

9. Egalitarianism: This is another profound characteristic of CAS. It upholds the notion that all agents or components of a system are equivalent however they are equivalent in that none of the agents on their own can conceptualise or comprehend the entire system. If one agent attempts to fully understand a situation or problem, the agent will fail dismally. The only way in which a fuller understanding can begin to materialise is for many agents to jointly contribute their perceptions and understandings of the system.

As can be inferred from the previous paragraphs, CAS represents a new way in which to conceptualise the environments in which we operate whether it is our culture, organisations that we work for or one of the various Stock Exchanges. The reason that CAS is so important and the accompanying way to conceptualise our environments is because we have been primarily taught to think mechanistically. We assume that we can take a system apart, repair the problem area and put the system back together to form a working system. However, the dominant mechanistic thinking fails to truly acknowledge and highlight the dynamic interaction between the sub-components which is crucial for understanding and responding to an ever increasingly complex and unpredictable world.

The reason that CAS has been incorporated into this dissertation is that merely approaching policy making from one perspective and identifying a limited amount of variables or not acknowledging the relationships among those variables will not allow a full understanding to emerge. This is especially applicable to the relationships of the numerous aspects. The implications of Climate Change Mitigation policy for the economy, health of the population, development and planning and agricultural sectors, to name a few, might be acknowledged with a mechanistic outlook. However, an intimate appreciation of the linkages and the insinuations of the forward and backwards linkages and opportunities, with other related areas need an appropriate mental model to bring us closer to understanding what is really going on in the deeper layers of reality, not merely on the facade. It is important to note, that climate change could also be classified as a CAS.

Literature

The following discussion is planned to be an overview of literature that has focused on the area of knitting together CAS and the area of Climate Change Mitigation policy in a local government milieu. However, due to the relative scarcity of such academic work, the following discussion will also include selected peer reviewed articles that link complex systems and policy making at a local government level in policy areas other than Climate Change Mitigation.

Brown et al. (2008) presents a very comprehensive overview of the principles of systems thinking. The authors equate local government to being inherently a system in its own right and goes on to present a few examples, albeit with simplistic relationships via flow charts. The authors go to discuss feedback loops which are not only imperative for CAS but are also inherent in municipalities. The article also mentions and defines leverage points which are of particular interest to this dissertation. The elementary aspects of CAS are nicely presented, the publication seems to be lacking in depth. However, demonstrating CAS as an applicable theory, philosophy and its benefits are a positive first step in seeing CAS being incorporated into the mindset of individuals at large.

Chapman (2004) also provides an informative overview of CAS. However the publication presents knowledge that is at a somewhat deeper level than Brown et al. (2010). Some of the arguments put forward, which support the writing of this dissertation, is that the author states that traditional public policy based on mechanistic and reductionist outlooks have become redundant and are inadequate to solve the complex problems that government faces in the current age. It is further mentioned, that there are new stakeholders that are not answerable to government; this is also a key assumption of this research. Local activities are being increasingly directed by international stakeholders; this relationship and key international organisations have been outlined in chapter one of this dissertation. Another key aspect highlighted is the ways in which government will fail and the resulting pessimistic view, which the populace will hold, of government. It is suggested that systems thinking is a better substitute than current methods of rectifying problems and improving service delivery. The author then suggests that the policy makers need to try out alternates to policy formulation. However, government inherently hinders that process because of the typical military and mechanistic manner of government in undertaking its activities. Chapman (2004) very succulently presents CAS and, more importantly, frames CAS in policy making in a relevant manner.

Meek (2010) has undeniably stated in the opening paragraph of his paper that complexity theory can offer colossal opportunity to further our understanding of policy development. In addition, some of the core concepts of CAS do hold the probability of overcoming certain encumbrances of some approaches to policy. He further states that acknowledging the constraints of mechanistic

thinking and overcoming them are difficult. There are two main aspects that the author has highlighted. The first is that CAS will be useful for policy and secondly, that mechanistic thinking does inhibit one from fully understanding any system.

The above findings can be further supported by Minas (2012) who states that climate change offers a good challenge to complexity advocates. This is because of the vast intricacy and interconnectedness with issues of the economy and numerous social issues. However, the research is based in the Chinese context. Minas (2012) further states that the top-down approach undertaken in China has resulted in limited, if any, success and needs to better hold local officials accountable. He highlights two very important aspects which seem to resonate close to home as well. These are that climate change needs as much attention from government as from environmental protection and that the differences between provincial and local incentives have hindered advancement. He goes on to discuss a few case studies of climate change undertaken that are combined with CAS. These initiatives make good use of incentives, knowledge transfer, innovate economic programmes and subscribing to international organisations that deal with climate change. The author then concludes that complexity thinking has a place in the future of climate change. Although, policy makers are central to establishing networks or the foundations for networks that will link and create communication channels between various stakeholders.

Meek et al. (2007) applies complex systems at a metropolitan level. Their article utilises complexity theory has a means to overcome some modern challenges facing officials at a metropolitan level and traverses the implications of administrative structures for public management and policy. Meek et al. (2007) further states that there is a move away from military styled organisations towards ones that are responsive and democratic. Although their research focuses on Peace Officers in a county in the USA, a number of lessons have been brought to the fore, which is worth mentioning for this research. These are that collaborative networks are suspected of being a prerequisite and important for dealing with complex systems in the current age and that the multitude of diverse stakeholders with their own objectives can add value to the whole system through collaboration. In addition Meek et al. (2007) suggest that networks need to function through co-operation where it is not driven from a central position and that there is a need to take a semi-formalised approach to assisting the broader system. It is important to note that Meek et al. (2007) suggest that collaborations is not just merely about networking and communicating. It should be more inclusive to the extent that common objectives or issues are rallied against and resources shared.

"When a network can choose its mission and command loyalty, then shared leadership, with consensus and negotiation as its cornerstone skills, is possible. No single person leads a mission-

*driven network and conflict is resolved at its lowest levels. Unlike organizational silos, sustainable networks operate effectively through government by consensus" (*Meek et al., 2007, p 33).

In addition to the findings of Meek et al. (2007) the following mentioned publication addresses the issue of inter-connectivity of many other related areas with a specific area.

Hall and Clark (2010) have indicated that CAS has been utilised for some time to conceptualise the world in which we live. Their publication endeavours to demonstrate the practical aspects of CAS which are imperative if we are to see CAS make its way into the tool box of policy makers. The paper revolves around the African Cassava Mosaic Virus Disease (ACMVD) in Uganda and the accompanying decrease in the production of cassava. The research also touches on a policy focus that has at its centre the ability to adapt to changing circumstances; it also emphasises capacity building and process improvement as a means to deal with unpredictable change. This is because of a belief that is held by the authors that policy has to be interwoven with CAS. Although the focus of the research was the growing of cassava the authors highlight the impacts and linkages with the economy, type of crop that was planted, social implications and biological insinuations. Among their concluding statements are suggestions that policy needs to shift from merely providing an enabling environment for innovation to one that has a more pre-emptive role in support of innovation.

The notion that CAS provides an unprecedented advantage of understanding social environments has been well documented, as illustrated above. However, that salutation has not fully translated into ways in which CAS can be practically used for specific benefits because of the intricacy and difficulty of the translation (Trochim & Cabrera, 2005). This means that while CAS can be modelled using computer simulations, it has not resulted in a manner where individuals use CAS to fully understand relationships and feedback loops in their daily lives. In their publication, Trochim & Cabrera (2005) show that concept mapping, as a theory, is a CAS. The results from the mapping exercise can recognize complexity in policy and that the resulting maps can be used as a tool to manage and leverage principles of CAS. They do, however, suggest that linking concept mapping and CAS could potentially result in 'group-thinking'. Essentially, concept mapping provides a structured manner in which CAS can be applied to practical utilise the theory of CAS. They go on to make some deeper conclusions that are not related to this dissertation as well. The publication by Trochim & Cabrera (2005) directly supports the objectives of the research but also illustrates that there is at least one practical way in which CAS can be deciphered and applied in practical contexts. Therefore, CAS would be beneficial but only if a pragmatic application of CAS to real life situations is established.

Another important question that arises is whether CAS can be fully implementable in a practical manner or whether it will be more beneficial to remain as a philosophy that will sensitise people to the inter-connectivity of our environments.

When operating in a local government arena, the officials and politicians are ultimately answerable to the rate payers. However that is from a theoretical stand point. It is therefore crucial that an appropriate monitoring system, that has a Complexity Theory foundation, is utilised. Innes and Booher (2000) make reference to a critical aspect of Complexity Theory in policy; that of indicators. The indicators will function as a means to determine the progress of policy implementation. Two important points need to be raised, that are mentioned in the paper; the first is that the people that will utilise the indicators have to be consulted in the development of the indicators. The second is the acknowledgement that cities effectively function as and are at heart Complex Adaptive Systems. The research further advocates the development of three differing indicators. The first types of indicators are those that highlight the status or progress of the City. The second kind of indicators will empower the relevant officials about the effectiveness of the policy or projects. The last kinds of indicators are those that will assist officials and politicians to make decisions on an on-going basis. Booher (2000) also suggests that the indicators have to be developed specifically for the City that it is needed, with the participation of all relevant stakeholders in the community. This is in-line with the notions of CAS. However, they also caution that such indicators only point out that something is working or that something is not working, it does not emphasize what the underlining problem or solution is.

The pursuit for optimal policy is similar to looking for the figurative pot of gold at the end of the rainbow (Desouza and Lin, 2011). However, Desouza and Lin (2011) advocate that the most feasible solution is to develop policy that is dynamic which can be useful in as many potential unknown future scenarios. They make mention that public policy which is dependent on and affects individuals requires an understanding of the behaviour of individuals and can lead to unpredictable and dynamic problems or situations. The degree to which policy makers can map together available information and relevant variables will determine the extent to which effective and flexible policy can be created. Desouza and Lin (2011) also caution against using individual cases or bits of information to generalise to a larger population and against using individuals' bits of information as a means to holistically describe a system. Desouza and Lin (2011) hint at the dangers of not predicting the knock-on effects of implementing certain solutions; which can at times be counterproductive and produce unimaginable results.

Summary

The pieces of literature discussed above have been discussed in the sequence and manner presented to demonstrate a few key aspects. The first is that it is evident that CAS will be beneficial for

policy formulation. It should replace the existing mechanistic thinking that is not able to satisfactorily frame the true working of our environments. Leverage points, specifically in municipal contexts have been written about, which is critical for bring about change and efficiencies with a minimal amount of resources. Furthermore, inter-connectivity of the municipality with national and international stakeholders and their resulting effect on localities has been briefly touched on. Another critical aspect that has been mentioned is that power has started shifting from the traditional sources to new stakeholders, an example of which is environmental lobby groups. Military styled or top-down approaches are not as efficient as undertaking the activity with the collaboration of relevant stakeholders. However, collaboration should been seen as more substantial and robust than just networking. In addition, it has been suggested that instead of waving the stick, a better approach to gather support and mobilise action to an activity is to rather dangle the figurative carrot through incentives.

An aspect that is at the heart of CAS thinking is that climate change is not just about preventing toxic gases being emitted into the atmosphere. It is interwoven with numerous other sectors which are part of the larger system. This includes the economy, air quality and food security to name a few. Traditional policy making was based on a rather rigid platform. However, for policy to remain relevant going into the future it needs to be pre-emptive and adaptive.

While CAS has been adequately represented in academic literature, there is a gap in the practical application of CAS in real life situations. This gap does not bode well for the reputation of CAS in being competent to be applied in practice.

Although CAS has been demonstrated to have numerous benefits over the antiquated theories and methods currently utilised, there is still a need for proof that it does work for individuals that apply it in their daily lives. This has seen the advent of a monitoring system, that still has CAS at its heart, but that provides a snap shot of the progress being made or of the health of the system.

Lastly, without CAS it would be close to impossible to create policy that would be able to respond to unforeseen challenges or opportunities. CAS allows or is able to provide a platform on which policy can be created that is responsive to all seen and unseen future events. It is also important to guard against generalising information from a small sample to the lager population. Therefore, it is therefore necessary to engage all stakeholders and gather all information in order to utilise policy to create effect responses to stimuli.

Policy and related Literature

Overview

While the preceding section of this chapter discussed the numerous ways in which CAS has been used in the realm of policy, this section discusses the many aspects that have been researched which relate to policy at a local government level without a CAS outlook. The rationale of separating this section, from the previous, is to establish the fact that there are many different facets that affect, and should be considered for a more comprehensive understanding, when addressing local government policies. From the research discussed below it will become clear that there are many areas to take into account to solve policy problems, create and or improve policy, that might have not be readily apparent previously.

Literature

Granberg and Elander (2007) have written about both Climate Change Mitigation and Adaptation in the context of municipalities in Sweden. They delve into the aspect of central and local government collaboration and the nature of networking of municipalities with other municipalities, both within Sweden and outside of Sweden. Although they state that Sweden is viewed as a pioneer in the field, their objectives have only given rise to somewhat mediocre tangible outcomes. The authors further mention that the Swedish national government uses an approach of direct and command, but that local knowledge plays an important part in informing objectives. Granberg and Elander (2007) further discuss the municipality's role in the formulation of policy as being the driving force. The national act or code of Sweden has left a lot of room for the municipalities to roll-out national policies and views the municipalities as a critical stakeholder in the policy chain. Incentives from national government have played a key role to stimulating municipalities to undertake a number of climate change related activities. After the incentives had been stopped a large number of municipalities still continued with their climate change activities. An important initiative was the creation of a forum in the City of Malmö. This forum acted as a facility to share and develop knowledge by ensuring that there is good information flow. The information flow would act as a catalyst to make numerous stakeholders take ownership of issues and therefore increase their contributions and collaboration. Some of the challenges that Granberg and Elander (2007) discuss in the concluding section of their paper is that Climate Change Mitigation seems to receive the lion's share of focus and effort being directed to pursuit of those goals rather than Climate Change Adaptation. They also mention that in local situation there remain contradictory goals, strategies and policies. The authors give an example of a city that aims to be a central location of transportation but that the city also wants to have a sustainable transport sector.

Lankao (2007) in her paper discusses a number of intriguing concepts and observations. However, two concepts mentioned by her elicit some very pertinent issues. These are the issues of fit and

institutional capacity. The issue of fit relates to structures at a local level that are created to solve or oversee particular areas. She further states that Mexico City is managed by a range of levels of government and the city is just like a complex system with related aspects that are always in flux. It is further mentioned that a number of commissions that have been set up to tackle specific issues but the lack of holistic coordination and monitoring gives rise to a lot of confusion as there are legions of plans with varying timelines. The second concept which aims to pin-point the reasons as to why the lack of coordination has arisen is institutional capacity. They discuss some aspects that contribute to this, with the first being management inaptitude which they inversely link to the financial scale and revenue generation of the City. Another aspect is the nature of the intergovernmental cooperation which is difficult in Mexico City. This is because various levels of government are being managed by different political parties, this she states inhibits collaboration. She also mentions a critical constraint which is a bigger contributor to non-performance than the author has implied. This is the capability and number of officials that possesses the necessary technical skills and knowledge to oversee emissions reductions and that standard are complied with. However, the author has not expanded on this enough and has not stressed the critical nature of having suitably qualified staff.

Bradford and Fraser (2008) make a very important observation and dig into the issue of policy relating to Small and Medium Enterprises (SMEs) in the United Kingdom (UK). The research is undertaken by means of a survey with SMEs with the aim of municipalities reducing emissions through those types of organisations from varying sectors. Their research aims to understand and correlate a number of aspects that range from the owners or managers of the mentioned organisations willingness to participate in mitigation activities to their awareness of government's obligations and activities. However, they make a very interesting reflection which is that policy very rarely targets SMEs in the UK. This is even though SMEs account for a significant percentage of organisations that can be found in almost every sector in the country. They also discuss a number of broad policy options that range from incentives to mandated activities for the varying sizes of SMEs and the sector that they operate in. This is a very pertinent point that needs to be taken into account for policy making for municipalities in South Africa. The government of the country, South Africa, has iterated many times that SMEs, or SMMEs in South African terminology, play and will play a significant part in the economy. Especially with regards to job creation, this is one of a number of key objectives for the government. The linkage therefore between the two is evident.

Falleth and Hovik (2009) have discussed environmental policy in their paper, there are key observations that can be applied to Climate Change Mitigation policy. They state that local government have dual roles in Norway in regards to enacting the national governments policies and at the same time acting as an establishment that has been voted in a democratic manner by the

people of that region. They use two cases studies from which they infer their findings. Some of the key findings that have relevance for this research are that local governments are a multi-focused origination focusing on matters like economic development and social issues at the same time but national governmental organisations are singularly focused and therefore have a very narrow view. They therefore state that there will be a disjuncture between the objectives of varying levels of government. The authors also discuss the issue of local governments serving local interests as opposed to working towards national mandates. However, their research seems to suggest that due to political aims the local objectives are pursued. In addition they also mention that bridging policies can be of benefit to all stakeholders. They give the example of protecting the environment which has financial impacts for local business but opportunities were tapped by way of promoting eco-tourism.

Niksic (2004) in his paper titled "Difficult but not impossible: The ANC's Decentralization Strategy in South Africa", discusses in a very encouraging manner about the ANC's adoption of a decentralisation strategy. This basically mandates local government to subscribe to the process of democracy and service delivery through consultation with relevant communities. While the publication is contextualised in Port Elizabeth, a few lessons are forth coming when juxtaposed with certain characteristics of CAS. They seem to be almost carbon copies. Some of the comparisons to CAS include that national government, various international states and organisations affect local government. This is almost parallel to the CAS tenet which states that there are various agents with their own schematics. The second lesson that is quite remarkable, from a CAS perspective, states the history of the community will determine the negative socio-economic ramifications for certain communities. Niksic's work seems to hint at the fact that the ANC inherently has a mind-set that is favourable towards CAS tendencies. The party seems to have included some of the theoretical fundamentals of CAS in building our current democracy.

Cameron (2005) has etched a very informative paper that highlights the history of the development of the South African municipal system to the present incarnation. He delves into issues and problems with the changeover from the non-existence of local government to the current form. An important point raised by the author is that frequent organisational restructuring can hinder the service delivery capabilities of municipalities. The reason that this is highlighted is that according to CAS philosophy history plays an important role in any system.

Howard (2009) discusses the issue of climate change information at a national level and between countries. Fundamentally the same issues apply to provinces or municipalities in a country. This is because those levels of government have a vested interest in their area of control. In addition, while national government might be responsible for certain areas of operation other levels of governments almost always have some sort of interest. Other levels of government should do

everything in its power to ensure its security and sustainability. He further goes into the aspect of climate change information. This he states is for the privy of developed nations, often with third world countries sorely lacking relevant and current information. An interesting notion that centres on access to such information is that access to climate change information, like when the country or municipality is going to be inundated with a natural catastrophe, will result in the locality vulnerable to military or terrorist attacks. This is because the focus and resources of that particular authority will be directed, almost solely, to the impending disaster. It is further presented that countries with access to important information or a system that can generate that information might not always share those resources with that are in need. This Howard (2009) deliberates is determined on whether the entity in need is of strategic significance for the entity that poses that information. The primary facet that has to be drawn from this publication is that access to information or systems that can generate climate change information can act as an early warning system as to where resources should be directed, has to be built into policy. This has to be included in the policy so as to highlight the importance of information but at the same time direct resources in pursuit of relevant information. However, especially with developing nations scarce resources are often earmarked for more tangible short term objectives or goals. However, the long term cost of not having information when it is needed could potentially far outweigh the short term opportunity costs.

Gala raga et al. (2011) states that for climate change to be addressed the relevant policies have to be put into place. While their research is focused on regional, provincial and non-governmental organisations a few pertinent points can be easily extrapolated to the municipal level. One of the most profound aspects that are raised is that climate change policy is not directed at a single department. It involves a number of departments that span very different areas. This therefore, implies that while there might be one department which is tasked with overseeing climate change activities those policies that are written should cover the activities of other departments. These departments can span from the electricity department to the water and sanitation department to the planning department. The policy needs to be written in an innovative manner which dovetails into existing policies for those departments. Alternatively the climate change policy should include an activity that seeks to include climate change issues in all other policies that have an impact on and produces or can reduce greenhouse gases emission sources that already exist.

Corbett and Hayden (1980) in the opening comments of their publication mention a small town in the State of California in the USA which was able to achieve large savings in energy consumption in the absence of national and provincial support. The lack of support from the higher echelons of government has in a sense put local government in a corner. This is with no other option but to respond with relevant energy reduction measures and platforms for the installation of Renewable Energy technologies. The resolution of the mentioned city for environmental and solar laws has

had a knock on affect which left the provincial and national government no option but to participate. The authors go on to discuss a few potential areas that local governments have at their discretion in the pursuit of climate change measures. These are briefly discussed below. It should be noted though that although their research is set in the USA, all of the mentioned areas are present in municipalities in South Africa. While the transfer or emulation of the detailed way in which the changes where implemented will not be practical, the lessons provide a good starting point for local policy makers to utilise and then adapt to the local contexts. The lessons are:

1. Building codes: Any construction that is undertaken in the jurisdiction of a municipality is required to have a building permit, amongst other things. This therefore, leaves a municipality with a lot of power in the sense of having authority to dictate the standards that the construction has to conform to.

2. Land use planning and zoning: The authors discuss some practical examples that were undertaken by the City of Davis. These ranges from planning for amenities to limiting transportation to ensuring rooftops are optimised for photovoltaic panels and window shading. They further mentioned examples of how Davis reduced the temperature by designing and constructing the streets in a narrow fashion which included trees.

3. Municipal facilities: Due to the extent of municipal services and operations, the municipality can undertake many initiatives that can contribute to energy reduction. These initiatives include installing solar water heaters to procuring more efficient vehicles. Furthermore, municipalities are in a position to offer recycling services, which will reduce the tonnage of waste delivered to land fill sites.

4. Municipal Energy Generation: The authors state that there is a huge potential for municipalities to generate their own energy, preferably through environment friendly means. Some of the technologies and processes include harvesting methane from landfills which are then converted to electricity. The eThekwini Municipality currently has two gas to electricity generation plants that are operational.

5. Education campaigns: Understandably, residents will be resistant to new technologies; especially technologies or process of which they have little or no knowledge and understanding of. The authors mention that this activity in winning over stakeholders is critical to ensure support is gained from various stakeholders. This can be undertaken by utilising a number of various activities but on a comprehensive and wide scale basis. The authors also hint at the fact that local elected politicians can play a positive role in the campaigns.

In addition, the authors discuss the key cohorts of people that are needed to drive a successful programme. The first is a political champion, which is able and willing to support the process. The second is a suitable grouping of individuals that are able to provide the necessary technical

information on which decisions will be made. Lastly, but certainly not the least important, is an outreach capacity that is able to educate, inform and ultimately win over the residents to the process or programme being punted.

Zahran et al. (2008) state that there are numerous areas that could potentially be impacted by Climate Change Mitigation policy. They further state that the Cities for Climate Protection (CCP) is the preeminent programme internationally that seeks to muster support from municipalities and cities in order to fight against climate change. Zahran et. al. (2008) goes on to determine the commitment level of cities towards the CPP utilising three variables. The first variable is climate change risk; which is the level of sensitivity that the city will be susceptible to climate change impacts. The second is climate change stress; which can be seen as the areas and extent of activity within the boundaries of the municipality that have an adverse affect on climate change. The third variable is civic capacity which is fundamentally the ability and willingness of its residents and an enhanced level of environmental consciousness that ultimately leads practical policy initiatives. While the research is based in the USA the findings provide a good starting point for policy makers to begin designing processes that will see wide-spread adoption of Climate Change Mitigation policies at a municipal level in South Africa. Ideally, any such policy should dovetail into existing objectives of the municipalities to ensure that multi-objectives are being met and that municipalities see the benefit of adopting Climate Change Mitigation policy. Zahran et al. (2008) eloquently illustrate their findings from the research which is rather enlightening and not the findings that one would expect from a logical guess. The findings include, firstly, that there is an inverse correlation between localities that have a higher contribution to greenhouse gas emissions and participation in CCP. Furthermore, the localities that emitted more greenhouse gases tend to be in the interior of the country. This results in those localities that emit more greenhouse gas having a reduced vulnerability to climate change because of their location. It culminates in an unwillingness of those localities to adopt Climate Change Mitigation policies; as they see themselves as been isolated from negative consequences. Secondly, localities that are most vulnerable to climate change are unwilling to engage with CCP because the authorities view the problem as not of their doing. Finally, localities that have a high degree of socio-environmental consciousness will be most open and enthusiastic to be involved in climate change initiatives.

Robinson and Gore (2005) state that Canadian municipalities are responsible for or have authority over the majority of greenhouse gas emissions in that country. They further mentioned that a few municipalities have begun addressing climate change as early as the late 1980's. Their publication aims to outline some of the barriers that prevent municipalities from respond to climate change. This is undertaken by surveying 392 Canadian municipalities. The authors mention that the data and findings from this research will become quickly obsolete; this is as a result of additional

municipalities engaging with climate change activities. However, they also state that the findings and information will provide a good platform for future research.

Drawing on numerous sources the authors highlight critical aspects that are necessary for implementation of climate change mitigation activities. These are:

1. Knowledge of greenhouse gas emissions in jurisdictions and consciousness of potential to reduce these gases;
2. Political support;
3. Financial resources; and
4. Technical resources and staff.

Before beginning the discussion of barriers the authors differentiate between municipalities that are not undertaking any climate change initiatives, which they term no-action municipalities, and municipalities that are undertaking climate change activities, which they term action municipalities.

The percentage of municipalities that undertake climate change activities increase with the population of the municipality. Of the no-action municipalities, 40.3% of respondents stated that municipal employees lack the necessary training to participate in Climate Change Mitigation. The same percentage stated that greenhouse gas reduction is not a main concern of their municipality. Insufficient financial resources were cited by 35% of respondents. 34.4% of respondents are of the opinion that Climate Change Mitigation is not a local government concern or mandate. Other barriers highlighted by respondents, in order of the percentages, include:

1. Climate Change Mitigation is the responsibility of national government;
2. It would command a large amount of employee's time;
3. Climate Change Mitigation is the responsibility of provincial governments;
4. Climate Change Mitigation is not a priority for its citizens;
5. Absence of legislative power or mandates
6. Opposition from the private sector; and
7. It still has not been proven definitively that climate change is a tangible danger.

The municipalities' responses seem to differ substantially. Financial restrictions where highlighted by 47.3% of respondents. A further 36.4% identified limited available staff hours with 25.5% indicating that any further advancement would not be possible due to the limited technical knowledge of their staff. Other barriers highlighted by respondents of action municipalities, in order of the percentages, include:

1. Additional mitigation of greenhouse gases are not a concern of their municipality;

2. Legislative mandates or delegated powers would be surpassed;

3. Additional mitigation of greenhouse gases are not a concern of their citizens;

4. Additional action would be opposed by a variety stakeholders; and

5. Current activities are sufficient.

Kousky and Schneider (2003) explore the inspiration and incentives of twenty three municipalities in the USA for municipalities to undertake Climate Change Mitigation policies. At the time of writing the publication, the authors state that there was a notable absence of the federal government in Climate Change Mitigation policies and activities and municipalities were responsible for the elementary tangible reductions in greenhouse gases.

The following aspects that can motivate the populace and officials in the pursuit of Climate Change Mitigation activities are highlighted:

1. Financial reductions;

2. Opportunity to achieve co-benefits;

3. Climate Change Mitigation champion;

4. Extend as part of existing initiatives;

5. Pressure from non-governmental organisations.

The authors caution against viewing financial reductions as a perception rather than in real terms. They also caution against assessing savings from activities solely in financial terms, this is because the social benefits and many other benefits cannot be quantified.

In addition they list a number of barriers that they suggest has an impact on energy efficiency issues at a local government level. These barriers are unforeseen expenses; consumers buying behaviour fondness for tried and tested less efficient technology; principal agent complications; negative externalities; absence of reliable information; capital costs.

The issue of co-benefits, which can come from a very wide array of areas, holds promise for the rapid adoption of Climate Change Mitigation in many municipalities that are not favourable towards the subject. Co-benefits can assist municipalities to provide a local context that its citizens can relate to; rationalize   and validate the pursuit of climate change policies and the allocation of funds. This is while utilising resources efficiently to tackle a number of objectives. Some of the perceived co-benefits to address climate change that emerged from the research included decreases in traffic volumes and road accident injuries; reduced maintenance costs; improved quality of air quality, health and the environment at large; reduced amounts of solid waste in landfills; creation of economic opportunities; advent of an attractive environment to investors; developing

partnerships with stakeholders that might have been otherwise overlooked; mitigated potential future costs.

Pitt and Randolph (2009) explore the hindrances that Cities in the USA face in implementing climate change initiatives. This is in cities that are in the early phases of planning for the phenomenon. The most frequent challenge that the authors, in their research, have discovered is that data required to create a GHGEI is difficult to obtain. They further note, that it is tricky to create climate change policies without first knowing from where the emissions are being emitted. The additional challenges that the authors group under methodological obstacles are:

1.   Inadequate data;
2.   Data gaps;
3.   Inaccessible data from private companies;
4.   Limitations of GHGEI software; and
5.   No standardised methodology for GHGEIs.

The authors go on to discuss the administrative challenges faced by cities. Some of the responses from interviews undertake include:

1.   Insufficient integration with provincial and neighbouring municipalities;
2.   Insufficient financial resources;
3.   Lack of internal technical staff;
4.   Limited spare capacity of staff;
5.   Conflicting objectives;
6.   Political indecision; and
7.   Disagreement from politicians and/or citizens.

Finally the authors reveal some of their findings that directly inhibit the reduction of greenhouse gases. These findings from their research include:

1.   Insufficient financial resources;
2.   Local transportation context makes reductions tricky; &
3.   Infrastructure needed for more environment friendlier fuels.

Summary

The literature highlighted and discussed above serves to illustrate the numerous aspects that can affect policy making in municipalities. While it was not possible to cover all aspects that affect the policy making of municipalities due to limitations of this research, the numerous aspects that can have influence on policy should be noted. There is a dire need to incorporate a broad outlook that takes into account the relationship of these aspects.

The literature that has been discussed includes critical networks that allow information flows between municipalities and stakeholders. As many municipalities have limited financial resources, incentives from national government stimulate action from municipalities in the climate change arena. The issue of structural fit of the organisation to the problems being addressed and the accompanying institutional capacity, primarily from a technical perspective, have been highlighted as a potential inhibitor from effective addressing climate change objectives.

Often political parties have been voted in for different spheres of government, this leads to non-willingness for the different levels to work together or even communicate; therefore resulting in situation idleness.

In South Africa, SMEs have been highlighted as a type of business that government actively wants to grow and assist. As a result of those businesses operating they can lead to a substantial contribution to the emission of greenhouse gases and policy. Therefore, room has to be made for targeting SMEs specifically but also other organisations that have a substantial amount of greenhouse gases emissions.

A simple concept but critical at the same time is that local governments are multi-focused. This means that they have many objectives that can include economic, social and political objectives. Eventually this will not only lead to a situation where the municipality has a plethora of conflicting policies but it will lock horns with national government, whose departments are singularly focused. Therefore it is critical that there is some middle ground or system in place in order for municipalities to achieve multiple objectives at the same time.

Surprisingly, the ANC which is the ruling political party in South Africa has exhibited an intentional commitment to CAS. This is by merely implementing its decentralisation strategy. This in itself can be a powerful starting point to embed CAS in government or at least sensitise politicians and officials to CAS.

While national governments direct the strategic direction of the country and commit the entire country to certain targets and objectives; it is often done without consulting other spheres of government. This, however, should not be the case as those decisions that are made by national government will have an impact on the operations of the other level of government. This should in principle result in consultation.

Access to information is again raised. Without valid information or incomplete data the resulting decisions that are based on that information will ultimately boil down to a 'thumb-suck'. However, access to that information or data are limited to those that have the financial power or have a

relationship with those that have the means to generate that data. As such, focus needs to be directed to the generation of reliable data that decisions can be based on.

Organisation Development Literature

Overview

In order for this research, as a whole, to have some continuity and applicability for local government and officials in general OD literature will be briefly discussed. OD will be discussed with the objective of embedding CAS thinking in local government. If this is not demonstrated as being possible then it would have been futile to exhibit the benefits of CAS for Climate Change Mitigation policy, or policy at large. This is because while it is beneficial to highlight the benefits and opportunities of CAS; it will be pointless if a method is not available that will facilitate the wide spread adoption of CAS by members of the municipality and society at large.

Literature

The specific definition of OD seems to be elusive in nature with many academics holding varying definitions of the subject. Burnes (2004) describes OD as a process of consistent learning, while utilising techniques to bring about lasting change in the culture of an organisation; which is in the pursuit of specific objectives that are set by the organisation. Cooke (1998) states that OD is also principally concerned with empowering individual people, participatory management practices and the notion of the individual and the organisation developing and learning in tandem and in a need for each other's survival.

Cooke (2004) acknowledges the fact that Kurt Lewin, a German Jew, who worked for the Cornell University, University of Iowa and MIT as the preeminent figure in the development of OD. However, Cooke (2004) also highlights additional significant contributions made by John Collier, Ronald Lippitt and Edgar Schein.

In order to bring about intended organisational change, Kurt Lewin developed a three step model. The steps are illustrated as follows:

Step 1: Unfreezing – Crous (2008) describe the first step as stepping out of comfort zones or diverging from the tried and tested or the familiar. This would highlight the fact that change is needed and any resistance would have needed to be removed.

Step 2: Change – Crous (2008) highlights the second step, which would only occur after the first has been fully completed as the process of transitioning to the envisaged state that would ensure the effectiveness of the organisation or any desired position.

Step 3: Re-freezing – Lastly, Crous (2008) state that the final step is to cement the actions or new achieve objectives or behaviours as the norm.

Bushe and Marshak (2009) states that elementary approaches to OD stipulated that distinct pictures of the situation has to be researched and data generated from that research will have an impact on change. They further believed that the resulting data was representative of the deeper unseen reality that mirrors what people see at the surface level. This elementary approach is what Rogers and Fraser (2003) term Diagnostic. Bushe and Marshak (2009) then go on to discuss a few of the contemporary OD practices, which Roger and Fraser (2003) term dialogical. One of the dialogical approaches that Bushe and Marshak (2009) discuss is Appreciative Inquiry (AI).

Rogers and Fraser (2003) state that while AI can be a valuable tool it also requires specialised skills if the process is going to be undertaken properly. AI is ultimately an evaluation approach. The authors make special note, however, that no one evaluation can be crowned the supreme evaluation method, rather the most appropriate method will be context and situation base; they also note that various approaches should be a part of the arsenal of individuals that operate in the field.

Glassman et al. (2012) while stating that Action Research (AR) is a critical component on numerous research activities, also state that it is strong concept that assists in facilitating individuals to step out of their comfort zones through independent processes. The authors mention that AR takes into cognisance the belief that groups are a system of social interface that strives toward a common purpose. Theoretically the approach is undertaken in a democratic manner which will allow for collective action to flourish. AR aims to overcome outdated mental models or behaviours and rejuvenate the outdated ways of operation through a process of group and individual introspection. In any grouping of people there will exist pre-defined rules that are religiously stuck to. However, those rules, behaviours or mental models are more often than not limiting and can likely cause irreparable damage. AR offers the theoretical basis and process on which to stimulate dialogues between all members of groupings, regardless of their standing in their grouping to bring about positive change as a collective in a self-governing manner.

However, Burnes (2004) provides another aspect of the debate, which is that early variants of OD and CAS have many commonalities. However, the author points out that the advent of CAS has had proponents for the case that there exist commonalities between Kurt Lewin's work on OD and CAS. There have also been advocates for the academic argument that CAS can be used against Lewin. People that have put arguments against Lewin argue that his work was mechanistic in nature and took a crude approach to understanding organisations. Burnes (2004) publication, however, presents arguments in favour of the existing applicability of Lewin's work with the advent of CAS. The author goes on to discuss four aspects of Lewin's approach to change and how they actual provided a robust understanding of organisations that are undergoing change. These are

"field theory, group dynamics, action research and the 3-step model", Burnes (2004). The research highlights three similarities between Complexity Theories and Lewin's early OD approach. The first is that Lewin held a view of stability of organisations and their quasi-stationary equilibrium. The second commonality is that Lewin advocated that teams in organisations will organisation themselves. Finally, the last similarity highlighted by the author is that Lewin's theories and Complexity Theory could possibly be seen as the *"four elements of Planned change provided a process of identifying and changing order-generating rules"*, Burnes (2004, pg. 321).

Parumasur (2012) discusses the impact that organisational culture has over the success of OD interventions; the author highlights the critical aspect of aligning OD activities with the culture of the organisation. She firstly, however, discusses national and international practices of OD. The main findings that are raised by the author in her publication, applicable to this research are briefly touched on here. Firstly, awareness and acknowledgement must be given to the constant environmental flux that the organisation operates in and the repercussions of those changes on the organisation. Secondly, the author hones in on the importance of matching the values and culture of the organisation and the individuals with OD techniques and approaches utilised. This is to ensure that the OD process is supported by all relevant stakeholders.

As mentioned in the overview of this section, the objective of including OD in this research is to suggest or plot a potential way forward for embedding CAS in an organisation. From the brief discussion of some of the literature revolving around or focusing on OD, AI can form the basis or process which is utilised to enlighten the individuals in an organisation and therefore the organisation itself as to the true interconnectivity of our environments. It should be noted that this argument for using AI, and specifically the 4d-cycle as discussed in the following paragraphs, as a means to embed CAS in local government content is meant to hypothesise that it is possible and easier to merge existing methods with CAS for the uptake of CAS. An academic argument can be made of many existing theories, which can serve the same purpose as the 4d-cycle. In fact the AI 4d-cycle may not even be the best theory to utilise. An example of an alternative would be scenario work. However, through the 4d-cycle, we are able to bring up past lessons and experience which can be utilised to exhibit how little was known; this can act as a powerful motivator.

Crous (2008) discusses a few paradigms for appreciative inquiry and therefore organisational change; he discusses in some detail the 4d-Cycle. This can be beneficial specifically to embedding CAS in organisations; however with a few modifications. The modifications will be discussed in Chapter six; while the overview of the 4d-Cycle will be presented below:

> Phase 1: Define affirmative topic: According to Crous (2008) in order for the exercise to be
> focused it is essential to being the process of choosing a maximum of 5 topics. The selection

of these five topics should be able to stimulate discussion and thought amongst participants. This is undertaken as a prelude to the actual process.

Phase 2: Discover (identification of the enabling assets): Crous (2008) states that this process begins with an interview process of two individuals. This interview is undertaken from a basic set of questions in addition to a set of questions that have been specifically designed from Phase 1. The primary aim of this phase is to elicit accounts of things that work extremely well, including elements of the organisation that enable exemplary performance. The findings are then shared amongst the participants.

Phase 3: Dream (a possible future state): This phase as described by Crous (2008) entails the participants utilising the findings from phase 2 in order to imagine or dream a potential future state of being of the organisation. This phase rests on the premise of reinforcing positive future states which has as its foundations the actual findings from phase 2.

Phase 4: Design (an enabling social structure): The penultimate phase of the AI process of the 4d-cycle according to Crous (2008) involves the participants constructing systems that would enable the dreams, which emanate from phase 3, to be attained. This includes organisational organograms and processes or systems. There are many methodologies that are applied to arrive at the required state. While working in groups the participants construct 'possibility statements' which confirm the envisaged future state of the organisation which will be used as a guide for action.

Phase 5: The final phase concludes with three potential outcomes. These are:

1. Participants merely acknowledge and rejoice the findings from the process; or
2. Participants create and subscribe to teams that aim to turn the highlighted dreams into reality; or
3. The organisation transforms to include an appreciative learning aspect.

The last potential outcome has certain relevance for this research, as the aim is to embed CAS thinking in organisations.

Summary

The above discussion of OD literature has covered the definition and a brief description of OD. The 3-step model for change was touched on. There was a differentiation, which was touched on, between the older and newer approaches to OD. While there have been advocates for the older models of OD, stating that there is some commonality with CAS there have also been advocates against that notion. AI and AR were briefly described. The importance of organisational culture on the success of OD interventions was also briefly discussed.

AI was then discussed in a little more detail, with the 4d-Cycle being presented. While AI will be beneficial for embedding CAS in organisation, it should be noted that the 4d-Cycle as it exists will not be sufficient, it will need to include another level of discovery of CAS by the participants. This will be further discussed in Chapter six. It is important to note that similar adaptations, which are made to the 4d-cycle would have to be made to any other theory or method chosen to embed CAS in an organisation or individuals.

Conclusion

This chapter of the research has greatly stretched my outlook on the importance and the vast number of factors that affect policy, especially Climate Change Mitigation policy. An academic and scientific basis has also been created on which this current research aims to rest on.

While some of the aspects, of the pieces of research cited in this chapter, have been apparent before the research began there has been a legion of addition aspects that have been brought to the fore. This is in addition to confirming some of the previously known, but unconfirmed aspects. An overview of each section has already been provided after each section of this chapter. However, there are a few key and strategy lessons that deserve specific mention. These are as follows:

1. It is important to build a network between municipalities from across the country, and from other countries. This is because many of the problems that are experience have probably already been experience elsewhere and the sharing of this knowledge can greatly improve efficiency. However, it is important to keep in mind that any solution has to be tailored in local contexts.

2. As CAS cannot be directed by a single person, or position, it is important for the collective to work together for a common goal. While this is difficult to achieve in practice, consultation and participation provides a platform for this to take place.

3. Climate Change Mitigation offers the opportunity of achieving a number of existing objectives of a municipality; this is over and above the primary objective of reducing greenhouse gas emissions. This possibility of achieving multiple objectives needs to be highlighted, so that a support base can be garnered.

4. When addressing Climate Change Mitigation policy, a holistic outlook has to be adapted. Merely looking at the scientific aspects is just as important as the economic and political aspects, to name a few.

5. National government departments concentrate their efforts on a single focus area and there are numerous national government departments. Municipalities, being the closest level of government to the people, therefore, receive these multiple mandates from multiple sources. The ultimate result will be contradiction, in some sense. Therefore, local

government has an arduous task of being innovative to ensure that the conflicting goals and converted into complementary goals.

6. Cooperation amongst the various levels of government can greatly increase efficiencies, however that synergy is difficult to achieve as the silo mentality is very well subscribed to.

The academic basis for this research has now been formed. The findings from this chapter, and previous chapters, will now be used as a backdrop on which the heart of the research will be created, this is the research methodology, in the following chapter.

Chapter Three: Methodology and Research Findings

Introduction

The methodology of any research undertaken acts as a blue print for the implementation of the research. It spells out the theoretical underpinnings that will guide the process. While there is a legion of combinations of aspects that can be utilized, there is no one best research methodology or combination. In order to arrive at the best methodology, the question should be asked before the start of every new research initiative and decisions should be made based on the variables being researched. The methodology includes deciding on ways in which to choose a population and a relevant sample; from which the findings should be able to be generalised to the larger population. While all sub-components or aspects of research are important, particular attention must be made to the analysis, validation and reliability of data. If the data does not adequately meet those standards then the research findings run the risk of being classified as inadmissible. The methodology and related aspects that will be utilized for this research are discussed in the following sections of this chapter. It will form the basis on which the Key Research Questions will be answered.

The second part of the chapter will present the findings from the research that was undertaken. The research was undertaken according to the methodology etched out in the first part of this chapter. For purposes of thoroughness, the key questions that this research has embarked to answer are reiterated. The specific interview questions that were asked of the respondents are then presented; this is accompanied with a brief description of each question. Thereafter, a brief overview will be provided as to the number and nature of replies to this research by the sample. This will be explained in further detail. The coding that was utilised for the findings of the research will then be discussed. Finally, the heart of findings will be presented; this is the actual findings from the research. The information will be presented in tables but will be elaborated on, where necessary.

Philosophical Worldview

Creswell (2009) discusses four worldviews. These worldviews while not overtly apparent do serve to guide the rest of the research process and subsequent decisions on various elements that come together to form the research methodology. The four worldviews are 1. Postpositivism, 2. Advocacy and Participatory, 3. Constructivism and 4. Pragmatism.

Postpositivism has been ruled out as the chosen worldview for this research for a number of reasons. The most evident is that this worldview is more suited to quantitative research (Creswell, 2009). It holds the premise of cause and effect, which is indicative of a mechanistic underpinning.

In addition, the Advocacy & Participatory worldview has also been ruled out. While there might be synergies for this research, which is based on CAS, this worldview is not deemed to be the most appropriate worldview. Furthermore, the Pragmatism worldview has been dismissed. This is as a result of the worldview revolving around a Mixed Method Research Design. This research solely employees a qualitative research design.

As a result of dismissing the above worldviews, the worldview chosen for this research is the Social Constructivist worldview also known as Constructivism. Creswell (2009) provides a brief description of this worldview. It is one where people inherently want to comprehend the social environments that they are members of. Meanings are derived from independent interpretations which are as a result of their previous experiences. This ultimately results in a plethora of interpretations. Another tenet of this worldview is that the research heavily depends on the perceptions of the participating individuals. A preference is for open-ended questions so as to gather as much detailed and in-depth information as possible. Furthermore, the perceptions of the individuals are based in social and historical contexts which arise as a result of interactions.

Research Design

This research will focus solely on qualitative data. This to ensure that as much detailed and in-depth information as possible is collected. To illustrate the point, if policy makers in eThekwini Municipal do actually base decisions on mechanistic thought process; we need to understand whether this is because it is their mental model or that they have to make sub-standard decisions due to instructions from the powers that be. The qualitative data will also enable this research to gather a wide array of detailed perspectives and outlooks which would not be fully possible with qualitative data. In addition, all the qualitative data that will be gathered will be primary in nature. This is with exception to the analysis of existing policy making guidelines that the eThekwini Municipality has created and is used by various Units in order to create new policies.

Strategy of Inquiry

The strategy of inquiry which will be utilized for this research is the Case Study. This has been selected because the Case Study offers the ability to probe in an in-depth manner the Climate Change Mitigation phenomenon. Case Studies rely on data collection from a number of sources; as such this research will focus on primary data collection from the interviewing of officials and politicians of the eThekwini Municipality. It will also include existing documents on policy formulation that the eThekwini Municipality uses as a standard process to development policies. In addition Noor (2008) states that Case Studies do allow researchers to comprehend the complexities of situations in real life setting. While Case Studies have many advantages, they have often been negatively reviewed because of the absence of a robust scientific outlook and trustworthiness.

Furthermore, it has also attracted criticism that knowledge generated cannot be generalised. However, the disadvantages are somewhat outweighed by the advantages. The advantages include the ability to enable the research to develop a holistic picture of the researched topic and it is also able to identify the emergent aspects in and of a changing organisation.

While there are a number of types of Case Studies; this research seems to cross the boundaries of those types. However, this research seems to subscribe to the Explanatory Case Study.

Population

The population that has been identified for this research includes municipal officials and local government politicians in the eThekwini Municipality. It should be noted, however, that while all elected local politicians would play a role in the ultimate approval of Climate Change Mitigation policy, the research will only include members of the Human Settlements & Infrastructure (HS&I) Committee, to which the Energy Office reports. The Energy Office is primarily responsible for Climate Change Mitigation in the eThekwini Municipality. In addition to the HS&I Committee, the members of the Executive Committee (EXCO), theoretically, play an overarching role. Regarding the municipal officials, the first three levels of management have a direct involvement in policy formulation, however only a fraction theoretically would have input into Climate Change Mitigation policy. As such only those officials in the top three levels of management who have traditionally had input to Climate Change Mitigation initiatives in the eThekwini Municipality will be considered as part of the population. The relevant technical staff will also be considered as part of the population.

The eThekwini Municipality has quite a comprehensive structure of specialist units and departments. There is also a dedicated department that deals with policy formulation, amongst other strategic interventions for the eThekwini Municipality.

It should be noted, that it is common for municipal officials to appoint consultants that will aid them in the formation of policy; however it is not the same consultant or set of consultants that are engaged by the Municipality for differing policies. While consultants might play a key role in the formation of policy, due to their potential large number they will not be considered as part of this research population.

As a result of the preceding paragraphs, the total population has a number of 79 individuals. This has been calculated by summing the mentioned categories, which is also highlighted below:

1. HS&I Committee (37 Councillors);
2. Executive Committee (10 Councillors);
3. Top three levels of management (20 officials); and

4.   Technical Officials (12 officials).

Sampling Strategy

Firstly the sampling that will be undertaken is single-staged, as all the names of the members that make up the population are readily available. However, the list of names will not be presented in this research.

Any sample is given authenticity when a method that gives each member of the population an equal probability of being selected is utilized. However, the population of this research is relatively small. As such the sample will be selected on the basis of a non probability method more specifically by a convenience sample.

Data Collection Tool

One of the fundamental underpinnings of the Case Study methodology is triangulation. This entails utilizing various data collection tools that act as a means to ensure that data collected from various tools is comprehensive and better representative of reality.

However, due to the time limitations of this research it is only possible to utilize Interviews for primary data collection. The interview process makes use of pre-defined questions and not an interview schedule. As all of the sample members are accessible the interviews will be undertaken in person. Furthermore the interviews will be conducted at the offices of the identified sample members or at a venue of their choosing.

In addition, the eThekwini Municipality has a policy formulation guidance process and documents that are used to standardise the policy making process. These documents will not be included in this research but will be discussed.

Data Analysis

There are numerous tools and methods in which to analysis research findings. However, the selection of the most appropriate tool or method is dependent on a few aspects. One of these aspects is whether the research is qualitative, quantitative or mixed-method in nature.

This research is purely qualitative in nature, and while there are many analysis techniques, the 6 step process data analysis for qualitative research as advocated by Creswell (2009) will be utilized. The steps and accompanying sub-components are discussed below:

1.   Organisation and preparation of data: In the first step, the data collected from the Interview will be transcribed and prepared for the subsequent steps. The data that is generated from the interviews will be firstly categorized according the sequence that

the interviews were conducted followed by the policy making guideline that was generated by the eThekwini Municipality.

2. Peruse the data: All the categorized data will then be perused. This will be undertaken to get an overall sense of the content of the data.

3. Coding the data: The purpose of coding the collected primary qualitative data for this research is not to reduce the findings to a set of broad themes. It is rather a tool that is utilized to assist in making sense of the data so that it can be understood and logically presented without narrowing down the research. Firstly, each question that was asked during the interview will be given a number between one and twelve. This is solely to denote the sequence that the questions were asked. Thereafter, responses for each question will be categorized; codes or themes for this will be created as information emerges from the analysis of the data. The themes within each question will be given an alphabetic symbol to denote the unique themes. While this will be between A and Z, should the themes exceed twenty six in any one question, the coding will go on to include two alphabets, i.e. AA, AB.

4. Description of the data: In this step a description of the various themes will be written. While Creswell (2009) advises that the themes are limited to between five and seven. However, this research will not place a limit on the themes. This is as a result of the CAS outlook which seeks to build a coherent picture of the problem and therefore every identified theme is just as important as the other.

5. Representation of the data: The data will be illustrated via means of a narrative per each theme, but at the same time discussing some of the key connections with other themes.

6. Interpretation of the data: In the final step of the analysis of the data, meaning will be extrapolated from the previous steps. It will seek to determine whether mechanistic thinking is predominant in the mental models of policy makers while providing answers to the key research questions.

Data Validation

While there are many strategies advocated by Creswell (2009). The following two strategies will be utilised:

1. Member checking: Firstly the data analysis process will be completed; this includes the themes and narratives being written. Thereafter, relevant parts will be sent to the respondents to ascertain whether the respondents perceive the findings as being precise or not.

2. Discrepant information: Themes will be written based on data or information that is collected. Taking into account the various mental models that people possess, it is inevitable that contrary information or data will emerge. Therefore, the contrary data that emerges will also be discussed, if it arises, with regards to the relevant themes.

Data Reliability

While Data Validity and Data Reliability seem like the same thing, it is not. Data reliability is fundamentally the consistency of the research process throughout the research.

The following processes are advocated by Creswell (2009) in order to ensure that the findings of the research are Reliable:

1. Checking of records: All records will be reviewed, in order to determine if there were any deviations or mistakes.
2. Coding: The coding that was utilized during the data analysis part of the research will be double checked, by myself, to ensure that the coding remains the same throughout the research and that there are no apparent mistakes.
3. Verification of coding by an independent person: In addition to point two above, a third person to this research will be approached and requested to verify the coding of the data. This will allow any bias that has set in over the course of the coding process to be unveiled.

Questions

Key Research questions

As mentioned in chapter one there are a number of key questions that this research aims to answer. It is important to note that the answers to questions 1, 2 and 3, below, will be directly answered from the research findings. However, they are heavily based on the perceptions of the respondents and remain rather subjective. The specific questions asked and answered during the interviews are listed in the following section of this chapter. Question iv will be answered, also in a subjective manner, but by taking into account the findings from the research. Question v is answered via the formulation of a hypothesis; this is elaborated on in chapter six of this dissertation.

1. What are the perceptions of municipal officials and politicians of inconsistent and conflicting national, provincial and local laws impact on service delivery in the area of Climate Change Mitigation?
2. What is the status quo of the Climate Change Mitigation area?
3. What are the current levels of understanding and ways in which Climate Change Mitigation policy is formulated?

4. In what way can applying CAS thinking in local government help improve the formulation of policies in the Climate Change Mitigation area?

5. How can OD assist with embedding CAS thinking in local government?

Interview Questions

In order to answer some of the key research questions mentioned above, the following specific questions was asked of the respondents that participated in the research. The questions were purposely kept simple. In addition they were formulated so that there was some overlap between some of the questions; this was done to try to corroborate answers to different questions. It is remarkable that different answers will be provided for a question that fundamentally asks the same thing but using different words or from a different angle. While it might be sneaky, doing this can elicit a number of additional responses that will enrich the findings. Questions four and seven are prime examples of this. Brief explanations as to the objective of the questions follow the presentation of each question.

1. How do you define policy?
   - This question sought to determine what policy means to respondents and the ways in which policy is viewed.

2. What is the current status quo of Climate Change Mitigation policy?
   - This is an open ended question, in the sense that it aimed to get as much varied information as possible regarding how Climate Change Mitigation policy is currently being approached. However, it is important to note that a few of the respondents would answer the question from a general policy perspective and not specifically revolving around Climate Change Mitigation.

3. What is policy supposed to accomplish?
   - The intended outcome of this question is to determine what people believe is supposed to be accomplished by policy.

4. What are the important aspects to take into account when formulating policy?
   - This questioned aimed to determine what people take into account when making policy. A limited number of responses from a participant would hint at the absence of a holistic view of the environment and CAS thinking.

5. How do national and provincial laws, strategies and policy guide the policy making process at the local Climate Change Mitigation level?
   - The aim of this question is to find out the subjective views of how policies at the different levels of government affect each other, especially at a local level.

6. What are the impacts of policies, strategies and laws that do not align over the 3 levels of government?

- This question tried to find out the views of respondents of misalignment and the resulting consequences.

7. What are all the aspects that have an impact on policy formation?
    - This question's primary objective is to support the findings from question four, above. The answers of the two questions together would provide a reasonably accurate finding as to the holistic view of respondents.

8. What is the intended outcome of policy formulation and the time frames that it is applicable to?
    - It is important to determine the time frames that people attached to formulating policy and the duration that it will remain relevant.

9. Do current political objectives have a vast impact on policy formulation?
    - A large source of complexity can be from the changing political landscape with the resulting change in political objectives. Therefore, this question aimed to determine the impact politics have on policy formulation.

10. What are the current limitations of policy making?
    - This is a straight forward question, which aimed to elicit what people view as limiters of policy making. This will also provide some insight as to their holistic outlook, or lack thereof.

11. What are the current aspects that aid policy making?
    - This is a straight forward question, which aimed to elicit what people view as enablers of policy making. This will also provide some insight as to their holistic outlook, or lack thereof.

12. What theoretical references are consulted when formulating policy?
    - The aim of this question is to determine whether policy is just formulated or if there is research incorporated and scientific methods used to create policy.

Respondents

No.	Request sent to	Accepted	Accepted but later cancelled	Declined	Non- Response
1	Respondent A	Yes	-	-	-
2	Respondent B	Yes	-	-	-
3	Respondent C	Yes	-	-	-
4	Respondent D	Yes	-	-	-
5	Respondent E	Yes	-	-	-
6	Respondent F	Yes	-	-	-
7	Respondent G	Yes	-	-	-
8	Respondent H	Yes	-	-	-
9	Respondent I	Yes	-	-	-
10	Respondent J	Yes	-	-	-
11	Respondent K	Yes	-	-	-
12	Sample A	-	Yes	-	-
13	Sample B	-	Yes	-	-
14	Sample C	-	Yes	-	-
15	Sample D	-	-	-	Yes
16	Sample E	-	-	Yes	-
17	Sample F	-	-	-	Yes
18	Sample G	-	-	-	Yes
19	Sample H	-	-	-	Yes
20	Sample I	-	-	-	Yes
21	Sample J	-	-	-	Yes
22	Sample K	-	Yes	-	-
23	Sample L	-	-	Yes	-
24	Sample M	-	-	Yes	-
	Sub-total	**11**	**4**	**3**	**6**
	Total				**24**

Table 1: Requests sent to sample to participate in interview & responses

Requests

The above table, table 1, illustrates the number of requests that were forwarded to the purposefully selected sample for this research and the corresponding outcome of the request. To keep the identity of the respondents secure, the sample members that replied positively to the request, for an interview, will be labelled 'Respondent' and the sample members that did not participate in the interviews are labelled 'Sample'.

A total of twenty four requests were forwarded to officials and politicians that work within the eThekwini Municipality. In instances, where there were no responses to requests, follow up e-mails were sent. Some were successful, others not. The interviews were conducted from the 1st of August 2013 to the 12th September 2013.

It is important to note that all the Respondents and Samples listed in the table above are officials with in the eThekwini Municipality. However this is with the exception of Respondent F, Sample B and Sample C who are senior politicians within the eThekwini Municipality.

Accepted

All of the respondents readily agreed to participate in the interview. However, Respondent F needed some convincing that his participation will add value to the research. All of the interviews were held at the offices of the respondents. This is with exception to Respondent G; the interview was conducted a local coffee shop. All of the interviews took approximately 30 minutes to complete, with the exception of the interview with Respondent H which lasted almost 60 minutes. It is important to note that all the interviews were not recorded; only notes were jotted down during the interviews. A total of eleven people participated in the interviews.

Accepted but later cancelled

There were four individuals that agreed to participate in the interview and meetings were set up. However, due to urgent matters that materialised the scheduled meetings had to be postponed. It was not possible to reschedule the meetings because the remaining available time slots of the four people did not align to the time that was allocated for the interviews to be completed.

1. Sample A: A meeting was scheduled but was cancelled due to a meeting that Sample A had to attend.
2. Sample B: A meeting was scheduled but was cancelled due to an urgent matter Sample B had to attend to.
3. Sample C: A meeting was scheduled but was cancelled the day before because Sample C had to attend an urgent meeting the next day on behalf of his superior.

4.   Sample K: A meeting was scheduled but was cancelled due to an urgent meeting that Sample K had to attend.

Declined

There were three people that declined to participate in the interviews. The reasons for not participating are interesting and discussed briefly below.

1.   Sample E: Sample E stated that Respondent A was, "*better placed to discuss these with you*". However, I had already interviewed Respondent A. This response, to me, was a strange because Sample E is the Head of a Unit that plays and can play a much larger and more impactful role in the Climate Change Mitigation area.

2.   Sample L: Sample L stated that while the name of her title includes the word 'policy', "*my branch in not involved in Policy Development work at all*". She further stated that it was an old name and the function of the branch had changed over time.

3.   Sample M: Sample M stated, "*I am involved in the formal structuring of policies but not in strategic policy content issues that you raise*".

Non-Response

For purposes of this research, non-responses are classified as no meeting being scheduled to conduct the interview. However, the following should be noted:

1.   Sample D: Sample D has recently joined the Municipality in a Strategic Management position. As a result of that and the nature of the position, Sample D was not able to find available time in her diary. There was a lot of communication with her Personal Assistant.

2.   Sample F: No communication received

3.   Sample G: Due to the nature of Sample G's job, in normal circumstances it is near impossible to get a slot in his diary. However, he did indicate via his Personal Assistant that he would be willing but was too busy.

4.   Sample H, I & J: No communication received.

Coding

During the interview, notes were taken down with a book and pen, no electronic recording device was utilised. After the interviews were completed, the findings were transferred onto an electronic spreadsheet. Once all the interviews, eleven in total, where completed and transcribed in spreadsheet the findings were read through. Broad codes where created which were used to allocate the findings to specific themes. This code, was not predetermined, but was created as a response to themes that emanated from answers to the various questions, from the respondents.

It is important to first read the coding, which is contained in Annexure 1, before proceeding to read the actual findings.

Findings

Taking the coding discussed above into account; we can now proceed onto the actual findings of the interviews. As mentioned, all the findings from the interviews were used to create a code, which was given an alphabetic symbol; this can be found in Annexure 1.

This coding and the accompanying symbols were then used to summarise and categorise the responses of the individuals that participated in the interviews.

The table below is a summary of the number and uniqueness of the findings by each question. This is aggregated across all participants' responses.

Question number	Number of responses	Number of unique responses
1	13	7
2	29	22
3	26	18
4	65	39
5	25	14
6	32	27
7	44	28
8	20	14
9	23	10
10	33	29
11	27	20
12	31	21

Table 2: Summary of number of responses per Question

The detailed findings per respondent can be found in Annexure 2. To fully appreciate the information contain in Annexure 2 it will be necessary to cross reference the coding symbols with the information contained in Annexure 1.

Conclusion

This research will utilise the Constructivist worldview as the underpinning theoretical reference. It will be based on a qualitative research design, of which the information will be primarily collected through open-ended questions in Interviews. This research will rest upon the Case Study strategy of inquiry.

The population has been defined as officials and politicians of the eThekwini Municipality; with a non probability sampling method being employed.

The data analysis will be undertaken according to 6 steps, as outline by Creswell (2009). In addition, data validity will be addressed through checking the findings with the respondents and discussing any conflicting or contradictory findings. Three different processes will be utilised to check the data reliability. These are checking of all research records, double checking the coding and engaging an independent person to double checking the consistency of the coding.

The first part of this chapter has formulated the blueprint or roadmap that will be utilised to start, implement and complete this research. It will form the ultimate guideline, to fall back on during the research to ensure that the Key Research Questions are answered as accurately and consistently as possible. We can now proceed to presenting the findings from the research.

In the second part of this chapter the responses from individuals that participated in the interview were presented, this was with the accompanying coding for each theme that was mentioned. The coding of the themes was then used to classify responses for each question, per respondents. This allowed us to understanding the broad nature of the themes and more important the number of unique themes that were mentioned. An important part of this research was the response rate. This was discussed in detail and does, to an extent, show a strong willingness on the part of officials and politicians to address the issues of climate change. The number of unique responses, per question, against the total number of responses is seen to be in excess of 50% for most questions. This is a good finding, as it insinuates that as breadth of the consultation increase, so to can the comprehensive understanding of a situation or aspect.

Chapter Four: Analysis of Research Findings

Introduction

This chapter will analyse the findings presented in the previous chapter of this dissertation. The analysis will be accomplished by firstly discussing the themes that were created for each question. It is important to note, that the themes were created as a result of the answers to questions and not as a predetermined set of themes. At the same time, some key connections between the themes will be discussed. The connections will not be limited to themes within a specific question, but will also look at themes across all the questions. Thereafter, a brief discussion will be presented about the policy formulation process in the eThekwini Municipality. The next section will seek to interpret the findings and makes sense of it. Thereafter, answers to the Key Research Questions i-iv will be presented. The answer to the Key Research Question v is contained in Chapter Six of this dissertation. Before concluding the chapter with a summary section, the Data Validation and Data Reliability aspects will be briefly discussed.

The primary aim of this chapter is to present a discussion on the themes that were presented, in the previous chapter. Thereafter, that discussion will form the basis on which some of the key research questions will be answered.

Themes

There are a total of twelve questions that were asked during the interviews. The responses from the respondents were used to create the themes or codes. This was done for each of the questions. A discussion of each theme or code is presented below. This discussion will also discuss some key connections or links between other themes for the same question and themes for other questions. The aim of what each questions tried to achieve was discussed, briefly, in Chapter four.

Question 1: How do you define policy?

Theme A: Guiding Document.

> This suggests that policy would merely provide a generic way forward, which would act as a broad guide for future actions. This was mentioned three times out of the thirteen responses.

Theme B: Rules that direct interventions.

> This response suggests that policy lays down the 'law' and it has to be followed while undertaking future interventions. This theme appeared thrice in the responses.

Theme C: Statement of intent.

This theme suggests that policy merely presents what it is going to accomplish, or seeks to accomplish and was mentioned twice in the interviews.

Theme D: Framework to guide collective action in order to achieve a common goal or goals.

It hints that policy provides a broad outline to only steer the action of stakeholders and implementers to achieve goals. This underlying notion appeared twice in the interviews.

Theme E: How the organisation should consistently respond or undertake specific tasks to address goals.

In a sense this theme is echoing what Theme B, above, advocates. However, Theme B wants to direct interventions; while Theme E is aiming to, in part, respond to stimuli. This is a good mental model to have which will result in any opportunity or threat that can arise being taken advantage of. This was only raised once in the interviews.

Theme F: The people's will.

As local government, and government at large, exists to serve the people policy should naturally be a reflection of their will. This was only mentioned once.

Theme G: It is the accepted authority to implement.

This means that policy is the authority on which implementation takes place. If there is no policy, this would then indicate that whatever is being implemented is being implemented without a mandate. This theme was also mentioned once.

General discussion of the Theme:

As mentioned in chapter 4, there were a total of thirteen responses to this question. However, there were seven unique responses. While this seems to be a simple question, the insight that can be gained from the findings is interesting. This is suggested, because without being able to properly define something it would not be impossible to fully understand what is required to formulate or address it. All of the themes touch on very relevant, real life issues. However, it is apparent that all, but one, of the responses are of a mechanistic nature. While this is a subjective statement, it is based on the fact that themes talk to one aspect within a broader context. It is also noticeable that there is an absence of any mention of systems, relationships, feedback loops or a holistic picture that can be created from any one theme. However, when we start to piece together and combine all of the themes a more comprehensive definition of policy emerges. Although, the absence of relationships still stands valid. In addition, it is important to note that of the 11 respondents and 7 unique responses, no respondent mentioned more than 2 unique responses; this is an obvious lack of a holistic view, from a CAS perspective, of policy as opposed to approaching policy collectively.

Question 2: What is the current status quo of Climate Change Mitigation Policy?

Theme A: International agreements.

This theme means that activities, discussions and subsequent decisions that happen on an international platform will ultimately lead to national collaboration. This is because South Africa is a signatory to numerous pacts and agreements that focus on climate change. From a local government perspective this is one extremely relevant theme because all of the agreements that are supported by national government will eventually fall to local government to implement. This is in most cases. While important, this theme was only mentioned by one respondent.

Theme B: National White Papers that focus on climate change and energy.

Theme A would have a high degree of influence into such issues mentioned in theme B. This would then set the boundaries of what needs to be accomplished and how, for the rest of the state departments. Only one participant mentioned this theme.

Theme C: Legislation.

While documents mentioned in theme B will direct efforts, the law of the land also plays an important role. If the contents of documents mentioned in theme B does not align with legislation then any action can be open to prosecution and in some instances persecution. This theme was also mentioned by only one respondent.

Theme D: Provincial Gap.

As will be read in question 5, theme J; there should be a sequential flow for the creation of documents from national all the way to the local level. This is for many practical reasons. However, in this instance the respondent has stated that there is a gap in relevant documents at a provincial level. This can also be gleaned from the discussion in chapter two.

Theme E: Local policies and strategies.

At the moment all Climate Change Mitigation initiatives being implemented by and in the eThekwini Municipality can find its roots in the above mentioned documents. However, the DCCS which is still being developed is envisaged to have a substantial impact. This Theme was mentioned by two respondents.

Theme F: Transport sector has a lot of Mitigation potential.

This theme suggests that there is a lot of potential in the transport sector to reduce emissions. The eThekwini Municipality's GHGEI mentioned in chapter two supports this statement. However, it was only mentioned by one respondent.

Theme G: Green economy linked to Climate Change Mitigation.

This theme, surprisingly, was only mentioned by one respondent. In addition it was not considered as a central issue. The green economy and Climate Change Mitigation should go hand in hand. This is as a result of the ability of the green economy to drive the larger economy and job creation in a sustainable manner. In essence, it has the ability to achieve multiple objectives at the same time. The literature discussion in chapter three supports the notion of climate change having the potential to achieve multiple objectives.

Theme H: Not Sure.

Four respondents indicated that they were not sure, but went on to talk about the status quo of policy in general. Those findings are incorporated into some the themes for this question.

Theme I: Quantified reduction.

While only one respondent mentioned this theme, it is a key component of Climate Change Mitigation policy and of any policy for that matter. If no quantifiable target exists there will be no way in which to determine the effectiveness of the policy and if targets are being achieved.

Theme J: Unquantified reduction.

While quantified reductions are important, un-quantified reductions are also important. This was mentioned by one respondent.

Theme K: Good policy should be comprehensive.

Policy paints a picture of where we want to be. The one respondent that mentioned this theme also stated that effective policy should state how those objectives should be achieved. However, it is important to note that if policy is too prescriptive, it will not be able to adapt to changing circumstances and no results will be realised.

Theme L: Bridging technologies needed.

One respondent mentioned that bridging technologies are important to convince people and assist in facilitating the shift from fossil fuels to renewable energy. This is as opposed to trying to convince people to convert from one extreme to another. People are inherently opposed to change.

Theme M: Secondary policy.

Two respondents stated that Climate Change Mitigation policy is seen as secondary or less important policy. While they did not mention what policy it would be secondary to, it can

be presumed that the policies that have been in existence for a longer period of time and policies that directly relate to government's priority areas are being considered as primary.

Theme N: eThekwini Municipality started a long time ago in climate change activities

One respondent mentioned that the eThekwini Municipality began its climate change activities a long time go. Admittedly, the Municipality first began with Adaptation and then started with Mitigation. From a CAS perspective, the history of any system will undoubtedly have an impact on the system.

Theme O: Locally it is a mess.

Only one respondent thought and mentioned that the Climate Change Mitigation policy at the eThekwini Municipality is in a mess.

Theme P: Got onto the climate change issue late.

The respondent that mentioned theme O, above, also mentioned Theme P. These themes however, seem to be in direct contradiction to theme N.

Theme Q: Little policy on Climate Change Mitigation at a Cluster level (HS&I).

Only one respondent stated that there was little policy in the Human Settlements & Infrastructure Cluster on Climate Change Mitigation.

Theme R: Guide lower level documents and plans.

This theme was derived from the respondent answering the question from a general policy stand-point. Theme R states that policy should precede and direct strategy, including the resulting activities to be implemented.

Theme S: Knee jerk reaction to crisis.

One respondent stated that policy formulation is undertaken in response to a crisis. This would imply that policy is not formulated to capitalise on opportunities. It would further have the implication that if policy is responding to a crisis then the resulting policy would be rushed and sub-standard due to the urgency for a finalised document.

Theme T: Does exist.

Three respondents merely acknowledged that Climate Change Mitigation policy does exist.

Theme U: Currently being worked on.

One respondent mentioned that there is some policy in the Climate Change Mitigation area in the eThekwini Municipality that is currently under development.

Theme V: Difference between policy at a council level and at a unit or cluster level.

One respondent pointed out a very pertinent fact and that is that there is a difference between policy at a council level and policy at a unit level. Policy at a council level would imply that the policy is relevant across all clusters and units, while policy at a unit level would render it relevant and applicable only to the stated or a few units.

General discussion of the Theme:

Of the eleven respondents a total of twenty nine responses were collected during the interviews for this question. In addition, a staggering twenty two responses were unique. As the number of participants in the interviews increased no common platform or understanding was arrived at; we have an increasing number of themes emerging. However, a rather comprehensive understanding of the status quo of Climate Change Mitigation has been compiled. It is evident that no one respondent on his or her own could have compiled such an understanding. A comprehensive understanding of what the variables are will only become close to possible when the relevant stakeholders join efforts. This is one of the key tenets of CAS, which is that no agent on their own can fully comprehend the environment on their own.

However, what has not presented itself in this question, even in the smallest degree, is the relationship between the variables that have been identified. During the interviews, all of the variables or themes mentioned above where merely stated to be an aspect to the answer and it seemed as though most, if not all, of the themes are viewed in a mechanistic, stand alone perspective.

Question 3: What is policy supposed to accomplish?

Theme A: Provide a coherent vision, including understanding and direction of what needs to be done.

Theme A of this question states that policy does provide a rational and practical vision to be achieved. In addition, it lays the foundation to understand the context and an outline of the activities to be implemented to achieve the vision. However, should the presentation of the foundation not be updated, outdated information could be used to make decisions. This was mentioned by one respondent.

Theme B: Provides an indication as to the degree of success of implementation.

One respondent mentioned that policy, in part, should be able to indicate the success of implementation of the activities stated. Naturally, without a monitoring system it would be near impossible to determine if the policy is working.

Theme C: Impetus for the creation of an implementation plan.

Two respondents stated that policy precedes any implementation plan and creation thereof. It also acts as a stimulus for the creation of action plans. This is from a sequential point of view. This theme was also mentioned in question two, theme R.

Theme D: State the resources needed to achieve objectives.

This theme talks to an important aspect of the policy. Two respondents mentioned that any policy should unequivocally state the resources that would be needed to achieve the stated objectives of the policy. The resources can range from financial resources to human resources.

Theme E: Acts as a strategic action plan.

One respondent is of the opinion that policy plays the role of a strategic action plan.

Theme F: Assist in achieving specific results.

This theme is of the notion that policy supports efforts which seek to attain objectives. This was mentioned by two respondents.

Theme G: Directs work effort.

This theme has been mentioned by five respondents. They have stated that policy ultimately directs the work effort of the organisation and individuals within the organisation.

Theme H: Provides guidance.

It was declared by two respondents that policy does provide guidance. This can be according to what can and can't be done, how to do it, and how to monitor progress.

Theme I: Working within higher levels of service delivery.

This was mentioned by only one respondent.

Theme J: Non-compliance punishment

An important aspect of any authoritative documents that seeks to dictate action, is mentioning what the results for non-compliance would be. It was mentioned by only one respondent.

Theme K: Compliance motivators.

On the other end of the continuum from theme J is this theme. It states that policy should indicate what benefits will become available should compliance with the policy materialise. This theme was also only pointed out by one respondent.

Theme L: Reduction of carbon emissions.

Surprisingly, only one respondent declared that Climate Change Mitigation policy should result in the reduction of greenhouse gases. This arguably, should be the single biggest and most prominent objective of any such policy.

Theme M: Reinforce other pieces of policy and strategy.

This theme exhibits traits of holistic thinking and the relationship between other policies and strategies. It states that any policy should support other pieces of policy and strategy. It, however, was only mentioned by one respondent.

Theme N: Official position of the Municipality.

Any policy document of local government should be in the public domain. This theme states that policy should indicate to all stakeholders what the official stance of the municipality is on the relevant matter. This theme was mentioned by one respondent.

Theme O: The intent of what people believe is best for them.

Local government exists to serve the needs of the citizenry and politicians are elected by them. Therefore any policy developed by local government should be reflective of what people believe is best and want. Only one individual mentioned this theme during the interview.

Theme P: Consistency and fairness.

One respondent mentioned that policy is supposed to provide a platform where all relevant situations are approached with consistency and fairness.

Theme Q: Provide a high level understanding of the issue.

This theme was presented by only one respondent; it states that policy should provide an understanding of the relevant issue at a strategic level.

Theme R: Identify the core issues

Policy should identify the core issues of the relevant topic; this would then feed into theme Q. However, what has not been mentioned is the relationship between those core issues.

General discussion of the Theme:

Form the 11 individuals that participated in the interviews, a total of 26 responses were recorded. However, only 18 of the responses were unique in nature. While there were many different aspects mentioned of what policy should accomplish, no one respondent provided an answer as comprehensive as the communal answer. In addition, many aspects have been mentioned but the missing link is again the relationship and feedback loops between the variables. The mechanistic and reductionist outlook is still rather apparent. With the exception of theme G of this question,

there seems to be no convergence of answers between the participants. This is similar to the finding from the previous question. As the number of participants increase, the numbers of variables that are identified also increase. This can be a result of the individuals all having varying academic backgrounds, levels of experience and different things that they have experience during their lives.

What can be ascertained from the findings of this question is that policy is supposed to accomplish different things for different people. Until we start incorporating those things into the actual policy formulation, it will continue to remain a document that people, even subliminally, will be opposed to or not want to support. This is especially true for policy formulators and policy implementers. In addition, a comprehensive answer to the question can only arise by the collective providing contributions to create a holistic answer. This however, would only be relevant to those specific groups. Should another group answer the same question; the findings will be based on their specific context.

Question 4: What are the important aspects to take into account when formulating policy?

Theme A: Understand the situation.

    Before starting to formulate policy, two respondents have mentioned that it is critical to understand the situation. This entails an understanding of what the external and internal factors are.

Theme B: Other city policies.

    Two respondents have mentioned that it is important to be aware and take into account other policies within the organisation. This can be linked to Theme M of question 3.

Theme C: Policy should be developed as a result of a need.

    This theme states that policy should not be developed for no reason; it should rather be formulated as a result of a need. This was highlighted by three respondents.

Theme D: Policy should not be developed in isolation.

    Only one respondent mentioned this theme. The crux of this theme is that policy should not be developed on its own. It should be developed in line with other existing documents. Alternatively, it should be developed with supporting documents, like strategies. This was also mentioned in the previous question.

Theme E: Top-down approach for policy formulation is not effective.

    While only one respondent briefly discussed this theme, it is nevertheless important. From a CAS perspective, this is a very pertinent point.

Theme F: People.

This theme lists people as an aspect to take into account and was mentioned by two individuals during the interviews. People can be a great source of complexity and the identification of people as an aspect to take into account is a good start to highlight the benefits for CAS and embedding it in the organisation.

Theme G: Communication with people.

This was articulated by only one respondent. The communication with people is an important task that has to be undertaken carefully. Normally people will be less opposed to various things and be more supportive if they were communicated with properly and roped in as stakeholders. This, naturally, should be done in a sincere manner.

Theme H: Situational analysis.

While this theme is linked to theme A of this question, it will also result in the attainment of Theme A, if this theme is conducted properly. This theme was mentioned by two individuals.

Theme I: Research.

While this theme is linked to themes A and H of this question, this has been separated because this was mentioned in a broader context for supporting the understanding for themes J, K, T, M and N. Theme I was mentioned by two respondents.

Theme J: Institutional aspects.

Only one respondent has mentioned this theme but it is important to take into account whether the organisation is adequately geared to effectively implement and act on the policy.

Theme K: Finances.

This is an important aspect in almost anything that we do in this day and age. Naturally, the available finances will dictate what the policy can and cannot aim to accomplish. It should be seen as a key aspect or enabler. However, it was only mentioned by one individual during the interviews.

Theme L: Technical consideration.

Another theme that is closely linked to theme K is technical considerations. While policy can state beautiful and eloquent objectives, they have to be attainable with technology that is available and tested. Basing decisions on technology that is outdated or not yet developed is risky, to say the least. This theme was discussed by one respondent.

Theme M: Available skills of people that will implement the policy.

Another key aspect to take into account is the people that will do the actual implementation of the policy. Should the requisite skills level not be present in people, even with a good policy the objectives will amount to nothing. As with most themes, this was also only mentioned once.

Theme N: What is being done at the moment.

One respondent mentioned that understanding what is being done at the moment is important. It will naturally suggest what needs to be done next; however, it needs to be coupled with what the future would look like.

Theme O: What you want to achieve.

Three respondents have mentioned that knowing specifically what you want to achieve is important. This is because it will form one of the critical aspects on which the rest of the policy will be developed.

Theme P: Plan to achieve objectives.

This theme is linked to theme O. The important thing to take into account here is that the manner in which you seek to attain goals has to be practical and implementable. It should be considered as an important aspect because it was highlighted by five respondents.

Theme Q: Knowledge of subject matter of key stakeholders.

In order to develop effective policy, the industry specific knowledge that is contained within key individuals is very important. This theme links to quite a number of themes already discussed and is mainly targeted to officials that will be implementing, overseeing or supporting the policy. This was mentioned by three respondents

Theme R: Likely impacts the policy will have.

While it is important to have objectives in mind, it is also critical to note what the impacts of the policy will be. This is definitely an area that CAS can provide substantially benefit because of the vast number of relationships and feedback loops that will inevitably present themselves. This theme was discussed by two respondents.

Theme S: Risk assessment.

Two individuals have mentioned that it is important to conduct a risk assessment in order to know what the risks are and to try to mitigate them. This theme is closely aligned to themes H & I.

Theme T: Political leadership.

The political leadership plays a large role in any government institution, therefore it is important to understand what the political objectives are and respond to it. This will increases chances of support. Furthermore, having the active backing of the political leadership for any issue will make it easier to implement and get further buy-in. This was articulated by one respondent.

Theme U: Council decisions.

When any decision is taken or action is resolved to be supported by a Council of a local government it is tantamount to the law for the jurisdiction. It is therefore important to take into account all previous and relevant decisions. This was expressed by one respondent though.

Theme V: When elections are taking place.

This theme was mentioned by one respondent. The timing of the elections is important because it will have an impact on the attention that the policy will get. If elections and the development of the policy coincide; it could result in delays because of focus being diverted to the election by politicians.

Theme W: Clear purpose and what it is not.

Three individuals have expressed the importance of explicitly stating what the policy is, and what it is not. This will minimize any abuse of the policy and any potential confusion.

Theme X: Clear process.

The policy should also contain a roadmap of how the objectives are to be achieved. This was expressed by only one respondent.

Theme Y: Participation must be robust.

Two respondents are of the opinion that any consultation and participation in the formulation of the policy must be meaningful and robust. It should stimulate discussion, so that it also acts as a way of making people take ownership of the policy.

Theme Z: Who the audience is.

Policy can have a wide variety of audiences, it is therefore important to acknowledge who the audience of the policy is. Once that is done the policy can then be formulated specifically for that audience's ability to understand the various aspects. This was also articulated by two respondents and is similar to theme F.

Theme AA: Enablers and drivers of the policy.

While only one respondent has mentioned this theme, it is important to note what the enablers and drivers are. This is so that the policy can fully make use of them to achieve the goals.

Theme AB: Take into account different demographics.

This theme states that it is important to take into the demographics of the people that will be affected by the policy. This will allow the implementers to have a better understanding of how the affected people could potentially react and allow the implementers to plan accordingly. It was only stated by a single respondent and is linked to themes F and Z.

Theme AC: Outcome.

Two respondents have expressed the importance of taking the outcome into account.

Theme AD: Opportunities.

This theme has been articulated by two respondents. Policy should acknowledge and take advantage of any opportunities which are available that can assist the policy in achieving its goals.

Theme AE: Policy document must be written properly.

The actual policy document has to be written. This was mentioned by one respondent.

Theme AF: Do not reinvent the wheel.

One respondent has stated that it is important not to reinvent the wheel. The crux of the statement is that if policy does exist, it should be borrowed and adapted. However, from a CAS perspective the likelihood of the policy working to our environment, even if it did work elsewhere, is slim.

Theme AG: Legal framework.

The legal framework has been articulated by two respondents. This will indicate what is and what is not legally possible.

Theme AH: Diverse position of stakeholders.

The diverse position of the numerous stakeholders should be taken into account. The trick will be arriving at the best decision and policy, taking everyone's position into account.

Theme AI: Self adapting and not dogmatic.

This is a very important theme but was only mentioned by one respondent. Ultimately, the policy should be able to respond to whatever challenge or opportunity it is faced with. In other words it should be as flexible as possible.

Theme AJ: Terms of reference for authority or limitations.

One of the key purposes of policy, from question two, is that it serves as the authority to implement. Therefore, it is necessary for the policy to state plainly what authority exists and what the accompanying limitations are.

Theme AK: Practicability.

Two respondents have stated that the policy needs to be simple and practical. It should not be fancy and impractical.

Theme AL: Consult widely.

In order to support themes Y, Z & AH it is important that consultation happens on a wide scale basis. This has been mentioned by two respondents.

Theme AM: Must be done with drafts.

In order for policy to be accurate and representative is necessary to circulated drafts until all concerns and adequately addressed. This was highlighted by one respondent.

General discussion of the Theme:

There were a total of sixty five responses to this question from the eleven respondents. However, that figure decreased to thirty nine for unique responses.

As with the previous questions, the findings of this question are greatly enriched by combining the responses from all of the participants. Furthermore, no one respondent individually can provide an answer as comprehensive as the group's answer. To clarify, the groups answer is all the themes that were discussed. Albeit a large number of themes were generated, the aspect that was not mentioned is the relationship of the themes or variables. However, it is important to particularly point out that theme AI mentioned that policy should be able to adapt. This would suggest that the respondent is aware of the changing nature of the contexts and the need to respond accordingly. A number of themes mentioned, where covered by the literature discussed in chapter two. However, the converse is also true; a number of aspects mentioned in the literature do not feature in any of the answers for this question.

Question 5: How do National and Provincial laws, strategies and policy guide the policy making process at the Local Climate Change Mitigation level?

Theme A: They do not guide local policy.

Two respondents have echoed this sentiment. The response is directly around Climate Change Mitigation. National has policy and provincial leaves a little to be desired, local policies are based on what is required by that locality. This can be supported by theme D.

Theme B: Province is silent on Climate Change Mitigation issues.

While National government has numerous documents on Climate Change Mitigation, the provincial government of KwaZulu-Natal is serious lacking the relevant documents and policies. This was also highlighted by two individuals.

Theme C: Local needs not well articulated in National policies.

National government sets policies based on a number of factors, one of which is mentioned in theme A of question two. However, articulated by one respondent during the interview is that national government does not take local governments needs into account when formulating policies.

Theme D: Durban Climate Change Strategy link to National white paper is thin.

EThekwini Municipality is currently developing the Durban Climate Change Strategy (DCCS), however the link to the National Climate Change White paper is very thin and this is because of theme C. This was also highlighted by one individual.

Theme E: National and Provincial policies overrule Municipality's.

Local policy is subservient to provincial and national policy. This means that policies at a provincial or national level can take precedence over local policy. This theme was articulated by one respondent.

Theme F: Acts as a cornerstone for Municipalities.

National and provincial policies act as the foundations on which local government policies are based on. This was mentioned by two respondents.

Theme G: Local policies cannot be less rigorous than national or provincial.

This theme states that Local policy cannot be less strict or less comprehensive than policy at higher levels of government. It was highlighted by only one respondent.

Theme H: Local has to comply with national and provincial.

This theme was presented by three respondents. It states that Local government has no choice and has to comply with national and provincial policies.

Theme I: Local has to align with national and provincial.

In support of theme H, this theme states that local policy has to align with policy at a national and provincial level. This will imply that nothing should be in conflict. Two respondents talked about this theme.

Theme J: National guides provincial which guides local.

    This theme was brought to light by four individuals. It suggests a sequential manner in which policy should flow and develop. Essentially, national should advise provincial which should then direct local policy.

Theme K: Limits what local government can do.

    National and provincial limit what can be done at a local level, which was mentioned by two respondents.

Theme L: Top-down approach being used, does not work well.

    This theme was also mentioned in question four, theme E. This was stated again by one respondent.

Theme M: National might not take into account the different abilities of various Municipalities.

    While this theme was only mentioned by one respondent, the theme has some real insight. It states that the national government should keep in mind the difference in abilities and resources that are available to the various municipalities. Therefore, any plan should take this difference into account.

Theme N: Nothing is supposed to conflict with national and provincial.

    This theme directly links with themes H, I & J of this question; it states specifically that nothing is supposed to conflict with higher order policies. This theme was mentioned by two respondents.

General discussion of the Theme:

From the eleven respondents that participated in the interviews, a total of 25 responses emanated from the respondents for this question. However, only 14 responses are unique in nature.

In-line with the findings from the previous questions, any respondent on an individual basis would not have been able to create as comprehensive answers, when compared to a group answer. In addition, as per previous questions there is a want for a holistic view, especially when it comes to understanding the relationships of identified variables. It is important to note that due to the uncertainties of the importance of each variable identified and proximity to the central issue the impacts and feedbacks would be difficult to calculate at his point in time.

Question 6: What are the important impacts of policies, strategies and laws that do not align over the 3 levels of government?

Theme A: Too early to tell.

    While climate change has been in existence for a number of years, it is only in recent times that the South African government has taken an active stance on this matter. Therefore,

unlike existing disciplines, like electricity or water that has policies that have been inexistence for a long time, climate change is trying to play catch up. As a result, until all the necessary policies and strategies have been fully operational at all levels for a number of years will the real impacts be known. This theme was mentioned by one respondent.

Theme B: Cause confusion.

The result will be confusion between the spheres of government and key stakeholders. This was mentioned by four respondents.

Theme C: Cause conflicting goals.

When policies and strategies over the 3 levels of government do not align, the result will be conflicting goals among the different levels of government. This is dangerous because resources will be allocated according to the different goals, which is a recipe for disaster. This was highlighted by one respondent.

Theme D: Lead to multiple objectives

This theme is linked to theme C. The different levels of government will be chasing multiple objectives. While aim to achieve multiple objectives are not a bad thing, it can be dangerous when the pursuit of multiple objectives are uncoordinated. This theme was stated by one respondent.

Theme E: Will result in interference.

One respondent has mentioned that misalignment will result in interference in the activities of a sphere of government from a higher level of government.

Theme F: Chaos.

Misaligned policies and strategies over the different spheres of government will cause chaos for government. This has been talked about by one respondent.

Theme G: Excessive time in meetings to resolve discord.

Due to the conflicting policies, management would have to use valuable time to try and ease tensions that result. This has been highlighted by one respondent.

Theme H: Not looking at the picture holistically.

While this theme was mention in response to the question, it is actually one of the causes of arriving at such a situation. This theme was mentioned by one respondent.

Theme I: It will be hard to motivate for support.

When lower levels of government rebel against and conflict higher levels of government, the lower levels of government will find it more difficult to get support of higher levels of government. This was cited by one respondent.

Theme J: National and provincial needs to catch up to local activities.

This theme was mentioned by one respondent, it suggests that local activities are outpacing National and Provincial activities.

Theme K: Ineffective existing national and provincial policy.

This was highlighted by one respondent as well and is related to theme J.

Theme L: Disaster for cooperative governance.

At the first instance of contradiction by another level of government, especially a lower level, it could lead to denigration it will start the beginning of a suspicious relationship. It can also be a big problem for cooperative governance.

Theme M: Both negative and positive.

While this was mentioned by only one individual, the situation can give rise to both positive and negative aspects. However, it was not mentioned what the possibilities could be.

Theme N: Litigation between different levels of government.

A potential problem that can be initiated by a level of government against another level is legal action. This is not only costly but also counterproductive. It was stated by one respondent.

Theme O: The country will not be managed well, will not be sustainable and goals will not be achieved.

If the various levels of government of working against each other as opposed to working together, it can lead to a number of toxic aspects, which are mentioned in the theme. It was cited by one respondent.

Theme P: National and provincial mandates on municipalities with limited resources.

While the road to hell is paved with good intentions, it is important for National government to first consider what abilities local government has. This is stated because there are three different types of municipalities in South African and even within those categories, the abilities of the municipalities vary. This was stated by one respondent.

Theme Q: Others will end up undertaking activities to accomplish objectives.

If government is spending time and resources fighting each other; there are many types of organisations, like non-governmental organisations, that will fill the void of inaction. This theme was also disclosed by only one individual.

Theme R: Waste of resources.

This was mentioned by two respondents. Working against the different spheres of government will spend precious resources not being effective and improving the lives of the citizenry.

Theme S: Cancels out each other's efforts.

As mentioned in the previous few themes, government will be working in a counterproductive manner. Therefore, it will appear to the layman that nothing is being done by the government. This theme was mentioned by only one respondent.

Theme T: Lack of action because of uncertainty or confusion.

Due to the conflicting goals and policies there will be no action or confusion of what has to happen from individuals that suppose to implement the policies. This, like most of the themes, was stated by only one respondent. This can be linked to theme Q.

Theme U: Fragment and divide society.

This theme was also mentioned by one individual during the interviews.

Theme V: Unenforceable.

Due the various policies and strategies, should any be earmarked for implementation they will not be enforceable because the conflicting policies and strategies can be used as an argument against the initial one. This, again, was raised by only one respondent.

Theme W: Waste of managerial time and effort.

This is closely linked to theme G, in which resources will be spent on trying to put out fires as opposed to growing vegetables. This was highlighted by one respondent.

Theme X: Disorientates and conflicts with stakeholders.

If someone is receiving conflicting goals from numerous sources, the only eventual result is disorientation and ultimate confrontation with stakeholders. This was also mentioned by two respondents.

Theme Y: Frustration.

> When one is trying to achieve an objective and is confronted with obstacles from different levels of government, it will lead to a lot of frustration. This theme was stated by only one respondent

Theme Z: Poor view of government will arise.

> While this was mentioned by only one respondent, if the different spheres of government are chasing their own tails and each other's tails, the public will naturally develop a disdain for government. This will also lead to a lack of confidence in government.

Theme AA: Not conducive for development.

> This theme was cited by only one respondent. This theme will be one of the results of an ineffective system or environment.

General discussion of the Theme:

From the eleven respondents that participated in the interviews, there were a total of thirty two responses. This contained a total number of twenty seven unique responses.

The legion of responses derived from the interviews and the frequency with which they were mentioned does not hold any significance. However, should all of the responses be combined, they will provide a comprehensive answer to the question that was asked.

It is important, to again note, that there was no mention of an understanding of the relationships between variables to provide a fuller and more comprehensive answer to the question.

Question 7: What are all the aspects that have an impact on policy formulation?

Theme A: People.

> Three respondents have highlighted that people have an impact on policy formulation. However, it was not stated in a manner synonymous with CAS, rather it was stated as a broad aspect.

Theme B: Knowledge and competency of key officials.

> Naturally, any policy is only as good as the people that drive it. Therefore, five respondents have mentioned this theme. Without the relevant knowledge policy will be useless and open to scrutiny from many stakeholders.

Theme C: Pressure from civil society and private organisations.

> Often government has a plan and they stick to it or the key issues. This often entails some issues being left of the agenda. However, civil society plays an important role in

highlighting the areas that need attention from government. This was stated by only one respondent.

Theme D: Politicians or political objectives.

Even the City Manager reports to the Political Head of the Municipality, therefore politicians and politics have an impact on policy. This theme was cited by four respondents.

Theme E: Economic interests.

This was mentioned by three respondents. Often economic interests take precedence over many issues. This is more so in recent times, because of the large number of unemployed people.

Theme F: Institutional interests.

This theme was briefly mentioned by one respondent.

Theme G: Social aspects.

This theme was also briefly mentioned by one respondent.

Theme H: Socio-Economic-Environmental balance.

In order for true long term sustainability, merely balancing economic activities will not be sufficient. It is more sustainable in the long term to balance social, economic and environmental issues. This was only stated a single time during the interviews.

Theme I: Always opposition to change.

This theme is especially true for policy that advocates a radical shift from current comfort zones or advocates some new idea. Theme I was only stated by one respondent though.

Theme J: Impact of the policy.

This theme is ironic. The impact of the policy will determine the impact on the policy. It was cited by one respondent.

Theme K: Affordable.

It is pointless to create a policy that requires an unrealistic amount of financial resources to become attainable. Therefore, the policy needs to be affordable; this includes the creation and implementation. This was highlighted by one respondent.

Theme L: Legal parameters.

What is within and outside the law will determine the extent of the policy. This also includes the mandates of the different levels of government. This theme was vocalized by three respondents.

Theme M: Level and awareness of political leadership and knowledge.

In addition to theme D of this question, the ability of the political leadership to grasp and robustly interact with technical issues and the resulting leadership can play an important role. However, this was mentioned by only one respondent.

Theme N: Employment/income.

There is a link with theme E of this question. Creating jobs and generating income for the populace is an important aspect. However, in certain economic situations merely maintaining the number of jobs at a steady rate becomes the objective. This theme was stated by two respondents.

Theme O: Buy-in from stakeholders.

This is an important theme which is also linked to theme A. If stakeholders do not buy-in to the policy it sets the foundation for future opposition from them. In some instances those activities can be debilitating. Theme O was verbalised by two respondents.

Theme P: Bi-lateral agreements.

Bi-lateral agreements are long term in nature. This is mainly undertaken at a national level though. However, policy that is created cannot be in conflict with any of these bi-lateral agreements. This theme was mentioned by one respondent.

Theme Q: Where you are now, where you want to go, how long it will take to get there.

This theme is mechanistic in its structure. It stipulates a start, a process and a destination. However, there is no mention of the complexities of our environments. This theme was articulated by two respondents.

Theme R: Any potential hindrances.

This theme is rather broad, but does take into account the unpredictable nature of stimuli. It was mentioned by only one respondent.

Theme S: Will of the Municipality's top management.

The willingness of the Municipality's strategic management will impact what happens at lower levels, including what policy is pursued. This was presented by one respondent.

Theme T: Other existing policies.

While only one respondent mentioned this theme, it is important to note that the exact theme has been mentioned in other questions. Other policies should be seen as supporting such policy and vice versa.

Theme U: Specific events.

Events such as COP17 that was hosted in Durban in 2011 have the ability to sensitise people. It is through COP17 that many activities in the Climate Change Mitigation area emanate from. This theme was only stated by one respondent, the same applies to the remaining themes for this question.

Theme V: Community's culture or worldview.

The outlook of a community and the way in which the community perceives and responds to the world around them is an important aspect as it will dictate how the community will respond to certain policies. The basic approach is to be as sensitive to people's culture as possible, while resting their rights as far as possible. In addition, this theme has been mentioned in another question.

Theme W: Current states and perception of sovereignty that will result as a result of the influence of the policy.

Theme I states that people are naturally opposed to change. This theme postulates that the opposition increases when the policy directly affects the freedom or manoeuvrability of individuals.

Theme X: Poorly qualified authors of policy.

As mentioned in early themes, the policy is only as good as the people that have contribution to it. Therefore, policy authors with a lack of ability will create poor policy.

Theme Y: Ambiguity.

Often loosely worded laws, policies and such documents are used to find loop holes to dodge compliance. It is, therefore, necessary that policies do not mince around with words. It has to be direct and avoid any ambiguous statements that can be interpreted in unintended ways.

Theme Z: Not responding to real issues.

Often it is easier to address symptoms as opposed to the root causes. Therefore policy has to respond to the correct and core issues.

Theme AA: Will of the people.

Should theme O be properly carried out, any policy that emanates should be what the people want. However, there are many different kinds of people in society. While it is difficult to balance everyone's needs, it should be taken into account when policy is being formulated.

Theme AB: Little support.

This theme might not have an apparent effect during the formulation of the policy. Should this be the case with any policy, the devastating impact will be felt when it is time to implement the contents. However, if the process is approached carefully a lot of the probability for this can be reduced.

General discussion of the Theme:

A total of forty four responses were collected from the eleven respondents to Question seven. Only twenty eight responses were of a unique nature.

Due to the nature of the question, the true value of the answers lay in the number of different responses. This is because of the varying backgrounds and experience of the respondents they will view different things as having an impact on policy formulation. If they view it as important, then it must have some applicability. Furthermore, by combining the responses, which is why the number of unique responses are so useful, a more comprehensive view of the variables that have an impact on policy emerges.

However, as with the previous questions, the relationships between the variables are not mentioned. The interconnectedness should be seen as the 'life blood' that gives rise to life when these variables come together. The impression that I get is not that the respondents are unwilling to look into interconnectedness and relationships of the variables it; it is rather that this is a new suggestion that is not tried and tested. In addition, the magnitude of understanding those relationships needs a practical method, which has yet to present itself.

Question 8: What is the intended outcome of policy formulation and the time frames it is applicable to?

Theme A: Long term 50 years – plan.

This theme states that a long term policy should plan for fifty years. It was stated by one respondent.

Theme B: Short term 1 year – plan.

On the other end of the continuum of theme A, is a policy with a short term focus, usually one year. This was also stated by one respondent.

Theme C: Climate Change Mitigation probably 20 years.

However, taking the unique current nature of Climate Change Mitigation policy should plan for twenty years. This was stated by one respondent.

Theme D: Long term policy is vague

This theme states that the longer the focus of the policy, it will get vaguer. This was articulated by one respondent.

Theme E: No set time frames.

Five respondents have stated that there are no set time frames that policy has to adhere to. It would depend on the policy.

Theme F: Municipal Finance Management Act (MFMA) financial commitments cannot exceed more than 3 years.

The MFMA and the stipulation in the act states a Municipality cannot make financial commitments for more than three years. This naturally limits any long term planning. However, there is a provision that the Municipality can be invoked for a reprieve from this. This theme was mentioned by one respondent.

Theme G: Long term 20 years – plan.

This theme states that a long term policy should plan for twenty years. It was stated by one respondent.

Theme H: Integrated Development Plan (IDP) 5 years.

One respondent stated that the IDP is undertaken on a five year basis. However, it should be noted that the IDP is subjected to yearly reviews. Under normal circumstances policy would not be subject to annual reviews.

Theme I: 6 months to 1 year for formulation

Two respondents have stated that it takes a period of between six months and one year to formulate policy.

Theme J: Policy that has a life span

One respondent has mentioned that there are different kinds of policy. This theme talks to policy that has a life span, which can be in response to a specific project.

Theme K: Policy that is not time affected

This was highlighted by the same respondent that raised theme J. This kind of policy is not affected by time and is adopted indefinitely.

Theme L: Policy that is time dependent

This is the third type of policy mentioned by the respondent that mentioned themes J & K. This policy will only be valid for a specific time. An example of this is policy that was adopted specifically for the 2010 FIFA Soccer World Cup.

Theme M: 1 month if it is clear. Much longer with consultation for formulation

One respondent stated that it could take one month to formulate policy if everything is clear. However if there is a need for consultation it can lengthen the time.

Theme N: Normally 12 to 18 months for formulation

Two respondents have articulated that it can take anywhere from twelve to eighteen months for the development of a comprehensive policy.

General discussion of the Theme:

Of the eleven participants to this research, there were a total of twenty responses. However, there were a total of fourteen unique answers, which were discussed in the above themes.

The main finding of this question is the time taken to formulate policy and the time frames for which it remains relevant varies significantly. Reasons for the variation range from complexity of the policy to degree of consultation with relevant stakeholders.

Question 9: Do current political objectives have a vast impact on policy formulation?

Theme A: No

Two respondents stated that there is no political influence on policy formulation.

Theme B: Irony, political agenda might be similar.

This was highlighted by one respondent. What is meant here is even if a policy or anything for that matter is good it will be rejected by rival political parties merely because it has been suggested by another political party.

Theme C: Will of the government will surely have an impact on policy

One respondent has stated that it is inevitable that the will of the government will impact policy formulation.

Theme D: While some policies are administratively driven, others are politically driven.

This theme was highlighted by two respondents. It states that while politics does have an impact on policy formulation, it is only with regards to some policy. The other less important or sensitive policies are left up to Municipal officials.

Theme E: Yes.

An overwhelming seven respondents stated that politics does impact on policy formulation. Most of the respondent's answers were supplemented with another theme in their response.

Theme F: There is a difference between what is put down on paper and what happens behind the scenes.

This theme was stated by a brave respondent. It is stated that policy is merely a façade and the reality is not documented.

Theme G: Depends on the nature of the subject.

One respondent stated that it depends on the nature of the subject.

Theme H: It should because political parties are elected.

This theme states that politics and politicians should have an impact on policy formulation because they have been elected by the people. Assuming that they have been elected on the basis of similarity of the will if the people; their input into policy should be the will of the people.

Theme I: Not a vast impact.

Seven respondents are of the opinion that politics does not have a vast impact on policy formulation.

General discussion of the Theme:

A total of ten unique responses emanated from the interview with the eleven respondents. However, a total of twenty three responses were gathered from the interviews.

While it was stated that the impact of politics on policy depends on the nature of the topic, the vast majority of respondents are of the opinion that politics does influence policy formulation. However, the same majority also states that politics does not have a vast impact on policy formulation.

From a CAS perspective all of the answers will be relevant. Depending on the situation and context of the policy a particular time, certain answers will proof to be true and others false.

Question 10: What are the current limitations of policy making?

Theme A: People (especially officials) are too busy to have input.

Due to time constraints many people who should have input into policy during the formulation phase are not able to participate. Therefore, when policy is finalized and ready for implementation they have not had any input or bought in. Themes A to G were mentioned by only one respondent each.

Theme B: People ignore policy.

Often people overlook policy. This can be as a result of a number of factors. However, it is important to identify such behaviour and correct it as soon as possible. Especially in a government institution, nobody should be acting in a unilateral manner.

Theme C: Policies are generally too broad.

This theme states that policy often provides insufficient direction as to the activities that have to be implemented and instead paints a rather broad picture.

Theme D: Poor monitoring and evaluation.

Often people direct all attention to the implementation of the plan or policy. However, something that is often overlooked is the process that would monitor the effectiveness of the policy.

Theme E: Redevelopment of policies because of perceptions of ineffectiveness of the policy.

As a result of theme D, the notion would arise that the policy was not working. This would then start a process of redevelopment of the policy, or the development of an entirely new policy.

Theme F: People think short term; climate change is a much longer term issue.

Often people cannot focus or direct efforts to long terms issues, because of short term survivalist issues.

Theme G: People that are making policy are not educated.

This theme appeared a few times in the themes of previous questions. Basically, if an incompetent and uneducated person is making policy, the policy itself will be sub-standard.

Theme H: Policy makers that are not knowledgeable.

This theme was highlighted by three respondents. It is also linked to Theme G. If policy is formulated by people that are not knowledgeable of the topic that the probability of the policy not adequately responding to issues is increased substantially.

Theme I: Sufficient skilled people.

Even if a good policy is developed, that is only half the battle. There has to be people skilled in the focus area that are able to implement the policy. This theme was mentioned by two respondents.

Theme J: Political.

   While this theme is mentioned in question eleven, there are instances where the political wing of government will have a limiting effect on policy formulation. This was cited by two respondents.

Theme K: Lack of direction.

   The remainder of the themes for this question was highlighted by only one respondent.

Theme L: Other problems that are a priority.

   Often the problems or challenges that are more pressing and have a more immediate effect are given priority and more attention. Naturally, this is at the expense of long term issues.

Theme M: When people are under pressure they tend to fall back on what works.

   Often, when things do not go according to plan and pressure builds, people fall back on what they know to work. This can be undertaken even if it does not appear in the policy and is more reactive than proactive.

Theme N: Local government undertakes restructures too often.

   Often when there is new administrative management or political leadership, government undergoes a restricting. Frequent restructuring can be counterproductive, where a lot of effort is directed to those exercises.

Theme O: Uncertainties.

   This is an interesting theme. Uncertainties act as a limitation of policy. However, one of the few things that are certain in life is uncertainties. Therefore, an appropriate mechanism is needed to cope with uncertainties.

Theme P: Not participative.

   Policy that is not consultative or participative will limit the richness of the policy and the people that take ownership of the policy.

Theme Q: Not instructive.

   It was mentioned in this theme that policy does not instruct implementers as well as it should. However, if it is not worded broadly and is more prescriptive the room to adapt to unforeseen factors is greatly reduced.

Theme R: Illiteracy of affected people.

   While this is a wide-spread macro problem, it is still a problem.

Theme S: Unemployment.

When the unemployment rate is high, it has a huge knock on effect with the rest of the economy. In addition, often this and related issues normally take precedence over any other current issue.

Theme T: Not looking into the future.

The themes that emanated from question eight indicate that the policy formulation process takes a number of months. The changes that occur during the time can be substantial. Therefore, during that time if the future is not properly anticipate or neglected all together; it can lead to policy being developed for a reality or opportunities that do not exist.

Theme U: Sufficient time for implementation and to comment on draft policy.

The implementation of policy, especially new policy, cannot be rushed. It needs to have sufficient time to ensure that it is given the required attention. In addition, time is also needed to look over draft policy and fine tune it.

Theme V: Understanding if the policy is implementable.

The essence of this theme has been mentioned in a previous theme. Policy needs to be practical and implementable. Policy that paints an extraordinary picture will remain just a picture in our minds if it cannot be implemented.

Theme W: Policy that tries to respond to multiple objectives.

While the literature in chapter two states that Climate Change Mitigation can be better supported through positioning it has being able to achieve multiple objectives it is highlighted here as a limitation. I suspect, though, that what was really meant is multiple purposes of a policy can be limiting.

Theme X: Disjuncture between future reality and policy.

This theme is closely linked to theme T and can result in a misalignment of activities and what is conducive in the environment.

Theme Y: Constitution and legislation.

Naturally, government is guided by the constitution which states what local government can do. In addition we have to work within other legal frameworks.

Theme Z: Continual buy-in.

Merely getting buy-in from stakeholders during the policy formulation phase is not sufficient. That support has to be maintained throughout the life of the policy, all the way through to implementation. If the buy-in was apparent during one phase, it can change quickly due to various reasons.

Theme AA: Inflexible and dogmatic policy makers.

> With no flexibility comes rigid policy. People are needed that can think out of the box and be responsive to changes.

Theme AB: Not enough feedback.

> Consistent communication is important to support, amongst other themes, theme Z.

Theme AC: No implementation of policy.

> If policy is not bought into, does not have a dedicated person driving it or is considered or is considered to be sub-standard it can end up sitting on a shelf and not being implemented. These are just some reasons, though they do vary substantially.

General discussion of the Theme:

From the eleven participants in the interviews, a total of thirty three responses were recorded. Albeit a staggering twenty nine were unique answers.

This implies that when the individuals or respondents collaborated, as a collective they much better understand the environments and contexts within which they operate. This, naturally, would not have been possible if they attempted this on their own. Should the number of participants have increased the number of unique answers would have remained as high in relation to all responses. This would have provided an even more holistic view.

It is important to note that none of the answers are wrong. Furthermore, none of the answers can contradict each other, because the variables highlighted would have been identified as a result of the respondent experiencing it in a particular situation.

However, as with the previous questions; the aspect that has not been discussed is the link between variables.

Question 11: What are the current aspects that aid policy making?

Theme A: EThekwini Municipality has a dedicated policy development unit.

> This theme, and the next, was highlighted by one respondent. Some of the templates that this department has for policy formulation are discussed later on in this chapter.

Theme B: People not participating.

> While people not participating were also seen as a limiting factor, it can also be an aid. This is because people always have hidden agendas.

Theme C: EThekwini Municipality's human resource's skills.

Due to Metro status of eThekwini Municipality and the resulting financial resources that it has at its disposal; the Municipality is in a position to attract the appropriate skills. It was mentioned by two respondents.

Theme D: Staff capacity.

Staff at eThekwini Municipality has the ability to create capacity for important issues. This theme was articulated by two individuals.

Theme E: Relationship with other departments within the eThekwini Municipality.

Themes E to I were mentioned by only one respondent. Most departments within the eThekwini Municipality have a good relationship with each other. This is through formal and informal channels.

Theme F: Need to change from international pressure.

Often only if there is pressure, and from an important source will it act as an impetus for the creation of the necessary policy.

Theme G: Committed people.

People working for a higher cause can better aid the policy formulating process.

Theme H: People that have skills and vision.

While this is linked to Theme C, people also need to be visionary.

Theme I: High level support.

This theme was mentioned in a few earlier themes. Often any task is readily accepted and worked on by the organisation at large when it is sanctioned by top management.

Theme J: Major weather impacts can act as a catalyst to stimulate action.

This theme was mentioned by two respondents. Macro weather events can serve to sensitise people about climate change. However, if people are not directly affected the stimulus can be worn out fairly quickly.

Theme K: Pressure from civil rights groups or residents.

This theme was also mentioned in earlier themes and again here by two respondents.

Theme L: Leadership from the City Manager and Deputy City Managers.

While this links to Theme I, support and leadership need to be separated. Strategic management should take an active role in leading the policy formulation process. It was highlighted by three respondents.

Theme M: Policy writers.

In order of policy to be communicated properly, it has to be written properly. Themes M to Q were all mentioned by one respondent each.

Theme N: Technology.

As we progress into the technological age, the amount of available technology that aid policy making is increasing.

Theme O: Modernisation.

While linked to Theme N, this theme is about making what we do, even thought processes to an extent, more sophisticated.

Theme P: Globalisation.

We are now in a situation where borders of countries are becoming more blurred and the world is becoming a smaller place.

Theme Q: Clear view of what to achieve.

Having an unambiguous picture of what has to be achieved is important, because every decision has to be made in pursuit of that picture.

Theme R: Political support.

While this theme is mentioned in question 10, there are instances where political wing of government will have an enabling effect on policy formulation. This was cited by two respondents.

Theme S: Strategy and policy process must support each other.

Policy cannot achieve anything unilaterally, it needs to support and be supported by other documents and plans. The theme and the next were articulated by one respondent each.

Theme T: Well developed communication network.

This was mentioned by one respondent. It states that in order for the policy to be effectively communicated, an efficient network must be in place.

General discussion of the Theme:

Twenty seven responses were mentioned by the eleven respondents. However, only twenty were unique in nature.

As with the general discussion with the previous theme, when individuals pool their knowledge and experience they are better equipped to identify a more comprehensive response to any question, problem or opportunity.

It is important to note that the number of responses to this question is much lower when compared to the previous question. The previous question asked the respondents to identify the limitations of policy formulation, while this question asked for variables that aid policy formulation. Based on the higher number of responses to Question 10 and the lower number of responses to Question 11, this seems to indicate a fault finding culture as opposed to a solution orientated culture.

The absence of CAS or holistic thinking in this and all preceding questions is making a very good argument in support of embedding CAS in the organisation. Brown et al. (2004) and Chapman (2004) have articulated the benefits of CAS very nicely. As a result of exhibiting that CAS has numerous benefits and that CAS thinking is essentially non-existent, it should serve as a solid argument for the introduction of CAS thinking into the Municipality. Furthermore, Meet et al. (2007) has exhibited how complex systems thinking can overcome challenges.

Question 12: What theoretical references are consulted when formulating policy?

Theme A: It is policy specific.

> One respondent stated that the references that are consulted are dependent on the policy.

Theme B: Template from GIPO.

> As mentioned in an earlier them, there is an existing template which the Municipality has created to assist in the formation of policy. This was stated by one respondent. The templates will be discussed in another section of this chapter.

Theme C: Applied research.

> Two respondents stated research that is specifically undertaken for the policy.

Theme D: Academic research.

> Three respondents mentioned academic research is consulted for policy formulation.

Theme E: Grey Literature.

> One respondent articulated this. This means any literature that exists, but not formalized like academic research, that can assist with relevant information.

Theme F: Stakeholder engagement.

> Usually, stakeholders when combined can adequately respond and provide comprehensive information for formulation of policies. Therefore, it is possible to utilise stakeholder engagement to evoke the requisite information. Themes F to J were mentioned by one respondent each.

Theme G: Review of draft policy.

It is important for all stakeholders to review a draft of the policy, make comments and the necessary adjustments.

Theme H: Pilot project (Proof of concept).

If a new idea or policy has to be introduced, it can be undertake with a pilot project. This would serve to authenticate the issue.

Theme I: Depends on political marker and framework.

While this theme is similar to theme A of this question, it advocates that the reference is dependent on the political marker.

Theme J: Activities should be outcomes based and incorporates systems theory.

This is an interesting theme; the respondent has stated that activities should be based on end results. In addition, policy should be based on systems theory.

Theme K: Legislation and Acts.

All relevant legal aspects have to be taken into account to add further credibility of the policy. This was stated by four respondents.

Theme L: Bi-lateral agreements.

As mentioned in earlier themes, policy should not conflict with bi-lateral agreements and they should be consulted.

Theme M: None, it is more philosophical.

One respondent stated that no real references are consulted; rather the approach that is used is a more philosophical one. An example of this is the reduction of poverty.

Theme N: Best practice.

Often, it is useful to determine the best practice for the same field being used in other cities. However, a word of caution should be raised that what works well for one city will probably not work well for another city because of the inherent differences. This was mentioned by three respondents.

Theme O: What top management has articulated through various documents (vision, mission, goals).

Themes O to S have been mentioned by one respondent each. Policy should align with what top management have stated in various other documents.

Theme P: Institutional knowledge is very important.

The knowledge possessed by people that have been in the organisation for a long time is an invaluable source, which can lead to insight that cannot be found in any other source.

Theme Q: Informal agreements that are not officially documented.

Often many agreements are entered into between different kinds of people and these are not recorded. It is important to keep a record of these, because there is a risk that policy could contradict some of those arrangements.

Theme R: Consistency in principles and fairness.

It is important to maintain the organisation's principles, so that change in tone cannot be used against the organisation.

Theme S: Approaches by other cities.

It is important to determine what other cities, similar to eThekwini Municipality, are undertaking in the mentioned field. This would lead to some insight. However, the same caution should be applied as mention in theme N of this question.

Theme T: Other policies.

This was mentioned by three respondents. All other Municipal policies should be consulted to ensure that there is no contradiction, and synergies are leverages.

Theme U: What the BRICS (Brazil, Russia, India, China, and South Africa) members are doing.

The final theme mentioned during the interviews was by one respondent. This is to determine what cities in the BRICS membership are currently doing.

General discussion of the Theme:

A total of thirty one responses where mentioned by respondents. Only twenty one responses were unique in nature.

The most mentioned theme was Legislation; this implies that it is the most important. In addition, it would also imply that legislation and the relevant laws would be consulted fist. The second most mentioned theme is academic research, it is important for any policy to be able to withstand academic scrutiny.

It is important to note, the theme M, which states that no reference is used. Rather, a philosophical standpoint is used. This would indicate that the standpoint would emanate from the culture and broad objectives of the organisation.

However, depending on the policy and the context under which it is being formulated anyone of these responses can be correct. Furthermore, depending on the situation anyone or a combination can be utilised.

Conclusion of Themes

The previous section that presented the themes that resulted from the twelve questions that were asked during the interviews. The themes that have been briefly discussed essentially form one of the integral parts of this research. It is important to note, though, that the themes are very much subjective as they relied heavily on the view of the participants.

EThekwini Municipality Policy guideline

The eThekwini Municipality, like most arms of government, ensures that it is able to function effectively by ensuring that processes and procedures are standardised. This standardisation ranges from supply chain management to human resources recruitment processes. Therefore, it is natural that the formulation of important documents, like policy documents, has a standardised manner in which they are created.

City Managers Circular

In 2008, the then City Manager, circulated a Municipal wide policy development circular. The policy mentions a few important areas, these are outlined below:

1. Some officials have been formulating policy with limited guidance and training.
2. Policy has to be responsive to a variety of aspects and as a result a guideline for policy development was formulated.
3. The guideline dealt with only 'policy formulation' and 'policy writing' issues. All substantive input around the focus area should be the solely duty of the relevant Unit.
4. The guide aims to standardize the manner in which policy is created and written.
5. Actual policy courses have been created by the municipality and are available internally.
6. A technical policy committee was established to assist officials and ensure standardization.
7. A list of all municipal policies has been uploaded onto the municipal intranet.

The following section briefly discusses the templates and guidance documents that are available.

Policy Classification

The technical committee mentioned above, utilised a classification methodology from California to classify both internal and external municipal policy.

The Classification is:

- Administration and Governance
- Fiscal and Financial Services
- Human Resources
- Municipal Services
- Property and Land Rights
- Zoning and Planning

It was stated, however, that the lists are still being worked on.

Guidance for Policy writing

This document merely provides a template of what the actual policy document should contain. The section of the policy should contain the following sections:

1. Preamble
2. Purpose
3. Problem Statement
4. Policy Provisions/Rules
5. Procedures
6. Policy Evaluation and Review
7. Definitions and annexure

This is a handy document to have in order to standardize policy throughout the municipality. One of the main advantages is that it will save time sifting through a document looking for exactly what you are looking for in a policy that one has not seen before.

Policy Development Tool

This tool is presented in a table format. It has as its core five key milestones. Those milestones have a number of activities that need to be undertaken in order to achieve the milestones. It is important to note that no times frames are mentioned in this tool. It does not seem to be too prescriptive and merely states the broad activities that need attention. This is a good approach because it leaves a lot of flexibility for the policy writers and contributors to respondent to the unforeseen circumstances while at the same time working towards the attainment of the mile stones.

The five milestones are:

1. Agreement between the policy initiator and policy writer on the objectives and scope;
2. The creation of a broad framework document;

3. A draft policy;
4. Submission for approval of policy;
5. Approval of policy.

This tool breaks down the process into a number of components, which is suggestive of a reductionist and mechanistic approach.

Policy writing process

In support of the previous sections which focus on creating policy within the eThekwini Municipality this document states the specific steps that should be followed during the policy formulation process. Before the steps are briefly discussed, it is important to note that a number of areas that are highlighted by the document were also highlighted by the respondents to the interviews. While the document discusses, for each step, the objectives and allocation of duties, responsible person and process on review situation; only the objectives will be briefly discussed for each step.

Step 1: The official mandate to create a new policy.

Discussion: Policy has to be created as a result of a need. This was discovered during the interviews. The document suggests a number of areas that would give rise to a need.

Step 2: Policy writing team.

Discussion: In order to increase effectiveness, the document suggests that a number of people are appointed to the team. This includes people from the relevant unit or department.

Step 3: Scoping of task and creation of process.

Discussion: This step aims to identify variables that would have an impact. It would also look at the best practice issues, plan research that needs to be undertaken. In addition, it would plan the consultation with relevant stakeholders. Finally, it will determine the legal, structural and financial repercussions of the policy. The breath of the issues that are taken into account is good and will result in an overall picture. However, something that is not mentioned is the relationship of the variable and other factors identified. This is actually where most of the understanding of the context will result from.

Step 4: Research and consultation.

Discussion: Based on the plans create in the previous step, the relevant research and consultation will be undertaken. This is a straight forward step.

Step 5: Writing the purpose:

Discussion: There are various parts to the policy document. During this phase the Purpose of the policy is written.

Step 6: Writing of policy rules are procedures.

Discussion: This is the main part of the policy. It includes what has to be undertaken and how it should be undertaken. This is also a simple step. However, the writing of this step will be based on steps 3 and 4. It is therefore imperative that steps 3 and 4 are paid careful attention to.

Step 7: Formulation of monitoring and evaluation.

Discussion: During this step the monitoring and evaluation of the policy will be created and written.

Step 8: Writing of the problem statement.

Discussion: This should include the reasons for the development of the policy.

Step 9: Preface.

Discussion: While the tool lists this as an optional piece for the policy document, it will be very handy for someone reading the policy that is not familiar with the background and context of the topic area.

Step 10: Additional policy elements.

Discussion: In this step the additional sections that are need to bring the policy to life and give the document some coherence is formulated.

Step 11: Policy Committee.

Discussion: The Technical Policy Committee reviews the draft policy to ensure it complies with the issues mentioned in the previous sections.

Step 12: Edits.

Discussion: The necessary edits are undertaken in order to prepare the document for submission, requesting approval.

Step 13: Deputy City Managers Forum.

Discussion: The policy is submitted to the forum for approval.

Step 14: Communication.

Discussion: Once the policy has been approved, it has to be forwarded to the identified stakeholders (eThekwini Municipality, 2007).

The above mentioned steps are very useful in formulating policy. All of the steps mentioned definitely have relevance and need to be addressed. However, the most important aspect that is not discussed is the relationship between the variables, the feedback loops that exist and the complexity of the environment. This could, however, be covered in the research but that is highly doubted.

Conclusion of eThekwini Municipality Policy guideline

As can be seen in the previous discussion about the eThekwini Municipality Policy making process, it is a very structure and standardised process. While this standardisation might not work well in every situation, it is necessary for a large organisation to effectively create policy. There is an opportunity to embed CAS into the policy making process. The position of this research, on the most suitable manner to do that is presented in Chapter five of this research.

Interpretation of findings

If the world were a static place and there were no change in the environment where all components can be accurately predicted; then we are well equipped to respond to such a situation. Unfortunately, that is not the case. This disability is not as a result of anyone's abilities or cognitive skills; it is rather a result of the short sighted outlook by the education system. This can be supported by Meek (2010) where the limitations of mechanistic thinking are highlighted. While we still use reductionist and mechanistic outlooks to be seen to be doing something, if we really want to make an impact we should be upgrading our mental models and worldviews. Just like we do with our computers when we feel like the software is outdated.

In addition, a group answer to any question will always be more comprehensive when compared to the answers of individuals. This is because with a wide experience base and varying backgrounds the ability to provide answers from varying perspectives is increased exponentially. Therefore, consultation and collaboration is a good thing.

However, even with using the answers from groups, the existence of a holistic outlook and a thorough understanding of the relationships between variables and components have not materialised. These relationships should be seen as the life force of any CAS, and an understanding is paramount to begin to understand any CAS.

While one or two mentions, during the interviews and in the policy documents, have materialised about a holistic view and systems the basis on which policy is formulated still remains mechanistic and reductionist in nature.

It is important to acknowledge the themes that have arisen out of the twelve questions that have been asked in the interviews. The themes in relation to each question and in relation to other theme of different questions when synthesised can potentially bring about a vast amount of insight into the situation and research problem. In order to adequately respond to any situation it is important to first understand what it is that we are dealing with. Therefore, it will become important to define the topic, in this instance policy, and then understand what the current bench marks are followed by what is supposed to be achieved by policy. Using the previous three aspects as an example just by looking into the feedback to the questions from the participants one immediately starts to get a better appreciation not only of the situation as viewed by the main stakeholders but also a chance to understand them. While the themes can be interpreted in a number of differing ways, one of the primary aspects that can be observed is that there is not a complete absence of CAS thinking in the Municipality.

Key Research questions

As mentioned, there were a number of key research questions that this research set out to answer. Based on the findings from the interviews and the policy formulation documents these questions will now be answered.

1. What are the perceptions of Municipal officials and politicians of inconsistent and conflicting National, Provincial and Local laws impact on service delivery in the area of Climate Change Mitigation?

    Answer: The officials and politicians interviewed do perceive that local government has to work within larger policy frameworks and support the policy that comes from higher levels of government. However, some criticism is directed to provincial government in the Climate Change Mitigation area because they have not created sufficient policy in that area. The approach being used, which is that national policies guides provincial policy which then guides local policy, is seen as inefficient.

    That being stated, the consensus in the interviews is that any inconsistent and conflicting policies, laws and strategies will cause problems. These problems will not only materialise within local government but also externally between other spheres of government and the general public. A significant amount of resources can be swallowed as a result of these contradictions, government will be working against each other and the resulting chaos will paint government in a bad light.

2. What is the status quo of the Climate Change Mitigation area?

Answer: It was stated that the policy was still under development, as the area was new to South Africa and South African Municipalities. However, even with the limited existing policies, many people were not aware of it. Of the people that were aware of the policies, they were being viewed as secondary policy.

It should be noted, however, that the lack of relevant Climate Change Mitigation policies, at this point in time, is not a bad thing. It is actually an opportunity to formulate those policies using a CAS perspective. The pursuit of tackling complex issues, such as Climate Change Mitigation, can surely be assisted by a relevant mental model that can process complexities better than existing mental models. This point has been mentioned in academic literature, which was discussed in chapter two.

3. What are the current levels of understanding and ways in which Climate Change Mitigation policy is formulated?

    Answer: The current levels of understanding are more than sufficient. There is a lot of experience and skills contained within the eThekwini Municipality and some of the individuals have participated in this research. The way in which policy is formulated is also guided by a Municipal wide and standardized policy making process. This process is overseen by a technical policy committee.

    However, what is not taken into account is the relationship amongst the variables that are identified as having some impact. If the environment in which we operate was static, there would be no need to take this into account. As we know the world is in a constant state of change and an understanding of the relationship will allow policy maker to better construct policy that can respond sufficiently to a dynamic environment.

4. In what way can applying CAS thinking in local government help improve the formulation of policies in the Climate Change Mitigation area?

    Answer: The answer to this is very simple but the implications are far reaching. CAS can assist in fully understanding the relationship, dynamics and feedback loops between all the variables that affect policy. These are the aspects that give rise to any system or environment and are imperative to understand.

5. How can OD assist with embedding CAS thinking in local government?

> Answer: Chapter six of this dissertation is solely dedicated to answering this question. It is merely a hypothesis, which would need further research to establish its practicability. Please see chapter six for the answer to this question.

Data Validation

In chapter three a number of aspects were listed which would be undertaken to ensure the validity of this research. The following paragraph is a note on the validation aspect that was conducted by the respondents to the interviews.

Member checking: Two questions were sent to each Respondent. The respondents were then asked to verify the relevance and applicability of the findings per each question. The questions that were forwarded to the Respondents and the subsequent replies are listed below:

1. Respondent A: Questions 1 & 2: No Response.
2. Respondent B: Questions 3 & 4: Stated that the findings are correct.
3. Respondent C: Questions 5 & 6: Replied with either agreements or disagreements towards the various themes of the questions. However, the majority of responses were in agreement.
4. Respondent D: Questions 7 & 8: For question 7, the Respondent stated that *"political leadership, official's knowledge and social aspects are the most important"*. For question 8, the Respondent stated, "*While there is some long term planning in the municipality, I think that the majority of policy is short term, no longer than political term"*.
5. Respondent E: Questions 9 & 10: Out of Office reply.
6. Respondent F: Questions 11 & 12: Regarding question 11 the Respondent stated *"The findings the state of the municipality in respect to policy management at both political and management level. In the local government sphere policy making is driven by officials instead of politicians which is an abnormality compared to the Provincial and National sphere of government"*. Regarding question 12 the Respondent stated *"The findings reflect a short coming in policy participation at the local government sphere. The policy formulation processes are not followed effectively"*.
7. Respondent G: Questions 1 & 2: Out of Office reply.
8. Respondent H: Questions 3 & 4: No Response.
9. Respondent I: Questions 5 & 6: Out of Office reply.
10. Respondent J: Questions 7 & 8: No Response.
11. Respondent K: Questions 9 & 10: No Response.

Data Reliability

In chapter three a number of aspects were listed that would be undertaken in ensure the reliability of the data for this research. The following paragraph is a note on the reliability aspect that was conduct by an independent person to this research.

Verification of coding by an independent person: The data was verified by an individual that works for a non-governmental organisation in the Climate Change Mitigation area. She has a Masters degree in Energy and another Masters degree in Biotechnology. The findings are listed below:

1. A number of themes should be combined.
   Action taken: This comment suggests that a number of themes are very similar and should be combined. While in some instances this might be the case, the words used vary and therefore suggested a different meanings form respondents. In addition, the variety of answers is what gives richness to the research. Therefore no themes were combined.

2. A number of themes are not relevant.
   Answer: Some of the themes were identified as not relevant. However, that is according to the verifier's mental model. It would be relevant from the mental model of the respondents that mentioned those themes. Therefore no themes were removed from the list.

3. A number of themes need to be reworded.
   Answer: This was a valid point that some of the theme 'titles' were long winded. Therefore some themes were reworded. However, they were reworded while keeping the operative words of the theme intact.

Conclusion

This chapter discussed the answers that were collected, for the various questions that were asked during the interviews; a marked absence of CAs thinking was observed. The various themes, together with the policy formulation process that was instituted by the eThekwini Municipality were sufficient to enable the answering of most of the key research questions. The findings should not dissuade or discourage. Rather it should be seen as the impetus for the start of a new era. The biologists hold firm, that for continue success of a species, continuous biological evolution is needed. This is, naturally, until perfect is reached. While this is from a biological stand point, there is no reason why the same argument cannot hold true of the psychology of human beings. Finally, brief notes were made about the validation and reliability aspects that were undertaken by the

respondents and an independent person, respectively. The outcomes from those processes are also presented.

The final logical step of this research is to answer the final key research question. The need for such a hypothesis, to embed CAS in local government using adaptations to exiting methods, has been well documented in the preceding chapters and will now be presented in the next chapter.

Chapter Five: Embedding CAS in an Organisation

Introduction

During this research numerous officials and politicians have been interviewed. The officials interviewed are from varying academic and operational areas, which range from Solid Waste Management to Environmental protection. They also range in seniority from managers to heads of departments. Most have been in the employ of the eThekwini Municipality for many years, while others have just recently joined. The Politicians interviewed also have varying academic backgrounds and differing ranking according to seniority. Therefore, everyone has a unique standpoint from which to view and assess the need and composition of policy. It is only through bringing together these various standpoints that we can begin to respond adequately to the opportunities and problems that continually confront us.

While some remnants of CAS thinking have been exhibited by respondents in the research, a thorough appreciation of CAS remains elusive. More so, the benefits that such a theory can bring about. However, a comprehensive picture of the policymaking environment in the Climate Change Mitigation arena of the eThekwini Municipality has been fairly well established by combining the knowledge and experience of all respondents through this research. This is in-line with one of the key tenets of CAS which is that no agent or component can individually and truly comprehend the entire system. The obvious implication of the preceding statements is that all officials and politicians that are involved in policy making even in perceived unrelated operational areas, need to co-operate with each other in order to develop responsive policy. This argument can also be extended to other strategic documents that would include business plans, strategies, integrated development plans, and by-laws.

It should be noted, that the highlighting of the absence of CAS thinking in the respondents is not an attempt to discredit, criticise or negatively market any of the respondents or participants of this research. In addition, the respondents are also not responsible for the absence of CAS thinking because the education system is the real culprit. The only way advancement and progress is made is by firstly identifying any inadequacies in a system. This forms the basis on which improvements stem from.

A key finding that emanated during the literature review of this review is that the concerted uptake of climate change activities can be enhanced by using climate change to solve numerous existing problems or achieve existing objectives. Extrapolating that finding, it could be said that displaying the benefits of CAS to solve existing problems in a controlled or semi-controlled manner can assist with overcoming any resistance to CAS.

Objectives of this chapter

Although CAS from an academic, theoretical and philosophical perspective has been adequately demonstrated the practical application of CAS in the local government area leaves a little to be desired. This chapter theorises that CAS cannot be directly and practically implemented as a standalone theory. It has to rather be intertwined with existing practical processes in order to replace mechanistic and reductionist mental models with the philosophical underpinnings of CAS. This will then make it more palatable and easier for the officials and politicians at a local government level to except the change and embrace CAS.

This theorisation will be illustrated by using the Appreciative Inquiry 4d-cycle and necessary adaptation with CAS to embed CAS thinking in the eThekwini Municipality. This is done in order to offer a solution to implement CAS which would be a logical next step because of the preceding research and its findings. It should be noted however that the 4d-cycle discussed in chapter two has been used as a basis to arrive at the 6d-cycle.

Status quo of Organisation Development in Local Government

Local government is a very diverse sector. It consists of local, district and metropolitan municipalities. Those classifications of municipalities even within their defined boundaries are a very heterogeneous grouping. This is because of local contextual issues. Therefore, each municipality should have broad frameworks and tools with which to respond to specific opportunities and problems that materialise within their area of jurisdiction.

So, the question has to be raised as to why AI, as an OD intervention, is appropriate to embed CAS thinking in an organisation and is more relevant than other interventions. While interrogating the existing literature, Bushe & Kassam (2005) find two claims that distinguish AI from other OD interventions. These are that the AI process culminates with the advent of new knowledge, ways of doing things or hypotheses. The second is that a metaphor materialises that directs action. These two distinctions are synonymous with the principles of CAS, on a principle level at least. While Hall and Clark (2010) have indicated that CAS has been used for some time to conceptualise the world in which we live, it is the position of this dissertation that in the interim the most applicable manner to use CAS in real life situations is to align it to existing practical methods that echo some of its key fundamentals. The effectiveness of this suggestion can definitely be called into question. However, the effectiveness will surely be higher than the use of existing mechanistic and reductionist outlooks and methods. It can be equated to trying to make the most out of a bad situation. Our present point in the evolution of the theory has to be harnessed to provide the maximum amount of benefit as possible.

Discovering Complex Adaptive Systems

AI and the 4d-cycle have been more than adequately displayed, in existing literature, to be beneficial. However, the process does not take into account the age old mental models that are still implanted in the minds of the participants. Therefore it is inevitable that any outcome that is generated will still rest on reductionist and mechanistic thinking, even if it does seek to replicate pockets of excellence.

CAS has also been more than adequately displayed to hold many benefits for its users, especially in internalising an understanding of the relationships between variables within a system. However, the practical application on the theory still remains elusive. As a result, it is suggested that while that is being discovered, CAS would be more impactful if it is incorporated into existing methods or techniques. This is as opposed to creating entirely new tools, methods and applications that are based on CAS.

From the findings of this research, it is evident that if the experience, knowledge and diverse backgrounds of individuals when pooled together provide a fuller picture of reality. However, the collaboration needed between numerous people in an organisation is seldom realised. This is as a result of a number of factors, that include time constraints, silo mentality, and personal or personality clashes.

The proposition is, therefore, that another phase be added to the 4d-cycle that will both present CAS to participants and get them to undertake a participatory process in order to highlight benefits and begin the change in how they comprehend the environment. It should be noted that while one more phase has been added to the 4-d cycle, the suggested name is the 6d-cycle. This is because the 4d-cycle actually has 5 phases to it. It recognises the first phase as a prelude to the following phase and therefore not part of the cycle.

From 4d to 6d-cycle

A key enabler that has to be incorporated into future exercises or processes of this nature has to make use of technology. It has the ability to facilitate interaction between people that have a scarcity of available time and are geographically separated.

While the setting of the process or cycle can be in person or facilitated by technology, the underpinning phases and content thereof is a more crucial element. The following is a brief discussion of what a process that can embed CAS in local government or any organisation can look like. It is important to note, however, that this proposed process or adaption to the 6d-cycle is merely a proposal and serves to exhibit a way in which CAS can be incorporated. There are many levels of detail that, via future research, would have to be added to this proposed cycle.

Furthermore, it would have to be properly developed and tested over a period of time, in order to stand scientific scrutiny.
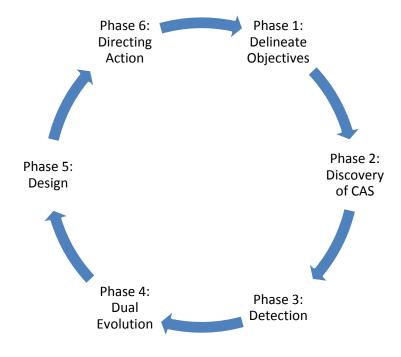

Figure 1: Diagram of the 6d-cycle

Phase 1: Delineate objectives:

Naturally any process or venture has to begin with a picture in mind of the eventual goal. This is good, as it gives direction. However, the difficulty lies in formulating objectives that can be achieved in a constantly changing environment, where the only thing that is certain and constant is change itself. In line with CAS, which tries to understand the world through metaphors and at a higher level of abstraction as opposed to delving into details and minute parts of the system; goals and objectives need to be broad. While there is a need for greater breath, too much broadness will leave people that have to turn the goals into reality bewildered. Therefore participants have to be careful when formulating objectives; a balance has to be struck. This is where all elements and stakeholders are taken into account and an optimal decision is made based on the current context, which we know changes constantly. So, at the same time the objectives should still be attainable and should still be able to give proper direction in changing circumstances.

Phase 2: Discovery of CAS:

There has been many sayings that embody the resistance that mankind has towards change. Nevertheless, the free thinkers know that with stepping outside of the box and

embracing innovation and the new comes endless possibilities. In addition, according to Neuroplasticity people have the ability to change and learn throughout their lives.

The Technology Adoption Lifecycle talks about the recognition and adoption of new technology which is based on numerous characteristics of the population and groups that are classified within the cycle. Fundamentally, when something is new and introduced into the market a small number of people with defined characteristics set will be the first to subscribe to that technology. The lifecycle then increases, peaks and then enters the final phase. CAS is over 30 years in existence. Due to the current intricacy of problems faced by the world, countries, and individuals solutions that are based on the real problems are needed now. The world is only going to become more complex and interwoven. We need to push CAS into the adoption phase that will see mass uptake. The only way to do that is to in a simple and uncomplicated manner communicate CAS to the people. This will necessitate dumbing it down; to ensure it is utilised by masses of people. The phrase 'dumbing down' is not intended to be demeaning. It is rather, a necessary evil. We all use laptops, cellular phones and automobiles but do we necessarily know how it works or how to fix it?

Participants of the 6d- cycle can potentially discover CAS through a myriad number of differing ways. Instead of being too prescriptive, the most appropriate manner should be based on the participants and the context.

As a guide, however, the ways in which that CAS can be presented to participants could potentially include the following:

1.   Non-participative lecture or presentation;
2.   Participative lecture or presentation;
3.   Participative exercise;
4.   Using a case study; and
5.   Presentation of simplifies reading material.

Phase 3: Detection:

The identification of, or the pursuit of, pockets of excellence is worthy exercise. However, trying to replicate pockets of excellence is bound to be a futile exercise, in most cases. This is because most of those pockets of excellence exist within systems that are complex and adaptive in nature. Going into history to learn will have merits however trying to exactly replicate what worked in a particular context in another different context will have varying results. This often dumbfounds its drivers. Therefore, the participants should, in the 6d-cycle, identify pockets of excellence, or

what worked, but base their success in the context and try to understand how the context or system within which it works enabled the pockets of success to be effective. Therefore, the detection phase consists of identifying two types of variables: 1. Things that worked well historically, these could be processes, policies, decisions and so forth; 2. The relationship of the things that worked well with the environment and how the environment contributed to enabling what worked well to be effective.

Phase 4: Dual evolution:

People will always have a vested interest in things that they have had a hand in creating. Therefore, this phase proposes that the participants create their 'fictional' own system from which to learn, but based on experience and lessons from the real world. It should be a process of iteration and reiteration. Participants should create an imaginary project, problem or current issue that is based on the outcomes of the previous phases. Thereafter each participant should have a turn to add in an agent or component of that system; while explaining its potential effects on the system and other components. This should continue until no more potential components can be added by the participants. This process however, should follow rules similar to the standard rules that are followed during brainstorming sessions.

Once that system has been fully developed by the participatory process of the individuals; an analysis should be undertaken. This analysis should ideally be facilitated by a suitably qualified person, and aim to use the system and interactions mentioned by the participants as a basis for discussions to highlight the tenets and benefits of CAS. The analysis should focus on identifying why components were added to the system; what would happen if specific components were removed from the system, what components would look like in the short, medium and long term, and how all the components affect and are affected by the system. Fundamentally, this phase seeks to get people thinking about how to create process, policies and practices that can be appropriate for a complex environment.

A key issue that needs attention is a situation where people cognitively understand the relationships of the variables but purposely overlook them because of, for argument sake, pressure from politicians or threats from powerful and connected individuals. Participants need to understand the impact of all of their decisions, not just for themselves but also for all other participants.

Phase 5: Design:

Merely designing processes or systems, while a good start, will not guarantee attainment of goals. The following should be taken into account when designing a system for the attainment of goals:

1.   Time lag between steps in the process, that inform the creation of systems relevant to changing environments;
2.   Flexibility of the process to adapt to changing circumstances;
3.   Embedding CAS in individuals that are part of the process; and
4.   Creating ways in which all the individuals that work towards the attainment of goals take ownership if those goals through active participation.

It should also be noted that while systems and the strategic issues are being given attention, significant attention needs to be rendered to the people that will make those things operable. If people that operate those things are not involved or consulted, all the effort will have been in vain. This includes every single person that is part of those systems. Merely consulting management or important people are not enough, for true positive impact it should include everyone.

Phase 6: Directing action

According to one of the tenets of CAS any system cannot be directed by a single component. This seems to be in direct conflict of trying to direct a system, as we or management know it. Therefore, the trick is for strategic management not to try and direct a system that they cannot fully direct anyway but for strategic management to facilitate the best decisions that arise as a result of a constantly changing environment. Naturally, this should be in pursuit of the broad objectives. It might seem ridiculous to suggest that decisions and direction should be made, based on future circumstances, at that point in time as opposed to setting everything out at the beginning. However, this will allow for the decision makers to fully take into account the circumstances at that particular time, which no one would have been able to foresee. The built in flexibility of this approach will enable better and more efficient decisions which are made at the point that it is needed, albeit within boundaries and with the objectives of the organisation in mind.

Further research

The preceding sections of this chapter have been written to illustrate a manner in which CAS can be embedded in local government. However, that hypothesis has not been tested. In fact, the people that suppose to undertake OD tasks, in the eThekwini Municipality, have not even been consulted

on the hypothesis. It has been written to demonstrate that it is possible to find new ways, while intertwining CAS with tried and tested methods, to bring about a mind shift in the mental models of people. However, there are numerous aspects that have to be researched to confirm whether the proposition of the 6d-model will be practical and actually work.

Another interesting point that has to have further attention is whether the actual 6d-cycle has to be undertaken in regular intervals to be effective within the context of CAS. This is the notion of a constantly changing system. Alternatively, it should also look into whether the process is needed only in response to specific opportunities or problems.

Many organisations already have existing OD interventions, this process while having its foundations in the traditional AI 4d-cycle is an evolved process and might not fit in and streamline into existing OD interventions. Therefore, this needs further attention, because two completely different ways of processing the worlds in which we live.

While we have seen a technological revolution of over the past 20 years, technology is still being innovated at a substantial rate. The innovation is also not fruitless but has the potential to make many tasks easier. Therefore, a thorough look into technology that can play a part in facilitating participation of stakeholders of the 6d-cycle and in facilitating communication so that everyone can participate comprehensively is needed. This is partly to a trend of using more sophisticated methods for various tasks but also to bring together people that have really busy schedules and might not all be based in the same locality.

Conclusion

This chapter looked into the issue of embedding CAS into local government. This is as a result of the potential benefits that CAS can have for policy making in the area of Climate Change Mitigation and policy at large in a local government setting. It was proposed that as people are instinctively against change, CAS should be married with a tried and tested method. This should make CAS more palatable for most individuals. While it was suggested that the existing 4d-cycle be modified to a 6d-cycle to embed CAS in local government; the proposed cycle is merely a proposal. Currently, there is no scientific basis for the 6d-cycle. This therefore will necessitate additional research to either establish the hypothesis or confine it to the history books as an absurd premise.

Chapter Six: Conclusion

Overview of Dissertation

The first chapter of this research began by providing some general background about the issue of climate change, specifically Climate Change Mitigation. This included a definition and some basic technical aspects that Climate Change Mitigation is founded on. The chapter then discussed the international context of Climate Change Mitigation. This then progressed onto a discussion of the national South African context, which included a brief discussion of Acts and White Papers. The discussion then honed in on the specific context of the eThekwini Municipality. The focus then shifted onto the actual foundations of the research; the problems statements where then presented. Key research questions which were derived from the problem statements, that will be answered by the research was put forth. Almost every research process has inherent limitations, this research is no different, and the limitations of this research were discussed. This was followed by the assumptions and significance of the research.

Chapter two then proceeded to provide a discussion of relevant academic literature. The chapter was separated into three sections that discussed literature that focused on different areas. The first section discussed CAS and provided an overview and definition before proceeding to discuss the relevant literature. A notable gap was evident of the convergence of CAS and policy, especially at a local government level. It is as a result of this that literature on policy that did not focus around CAS had to be discussed in section two. The section provided a broad view of the various aspects of policy, again focusing at a local government level. The third section of chapter two discussed OD literature, focusing specifically on the 4d-cycle of AI.

The third chapter then discussed the methodological underpinning of this research. It discussed the reasoning for choosing Social Constructivist as the worldview for this research. Thereafter the qualitative research design for this research was established. The population for this research was then presented; as was the sample strategy that would be utilised. In order to gather as much qualitative data as possible and in-line with the worldview and strategy of inquiry, interviews and policy guidance documents of the eThekwini Municipality would be invoked. Finally the procedures and process to ensure the validity and reliability of the data were presented.

Chapter four reiterated the key research questions. Thereafter the specific interview questions were presented and a brief description was provided of what they intend to accomplish. An overview was provided as to the number of requests that were sent to individuals to participate in the interview. The resulting responses were also presented and briefly discussed. The manner in which the findings by interview question were coded was discussed and the coding provided. The responses per respondent were then presented, both in a table format.

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In chapter five, the themes for each question were briefly discussed. In addition, overviews of the aggregated responses were presented per question. The themes were created as a result of the responses from the participants of the interviews. Thereafter the various policy guidance documents from the eThekwini Municipality were discussed. An aggregated response to all the responses from the interviews was then presented. The culmination of this research was then presented in the form of answers to the key research questions. However, it is important to note that the fifth key research question is contained in chapter six. The chapter then discussed the data validity and reliability findings from the respondents and independent coding verifier, respectively.

A hypothesis was formulated in chapter six as to the manner in which CAS thinking can be embedded in the eThekwini Municipality. This hypothesis proposed that the AI 4d-cycle be modified into a 6d-cycle that will enlighten the participants of the huge potential and applicability of CAS.

Further Research

The bulk of further suggested research is highlighted at the end of chapter six of this dissertation. However, this refers specifically to the hypothesis that was formulated as to the embedding of CAS in eThekwini Municipality or any organisation for that matter.

Regarding the further research prospects that could follow on from the broader research findings; it is suggested that the breadth of respondents be expanded to include a wide diversity of respondents. However, it should be noted that such an endeavour will be a time consuming which will also require perseverance in setting up the actual interviews.

Conclusion

The summary of what this research has presented is contained in the first section of this chapter. The process of the research not only answered the key research questions; but also provided a large amount of insight. This insight is into the area of Climate Change Mitigation and policy at a local government level and is bound to enable myself to have a positive impact on my involved in the Climate Change Mitigation area.

The ultimate finding of this research is that while officials and politicians can adequately identify variables that have an impact on a focus area, the understanding of the relationships between the variables and of the variables and the larger system has not yet been internalised. In response to this, CAS has been put forward as an adequate methodology to fill this gap. In it was hypothesised that the AI 4d-cycle should be adapted into a 6d-cycle to embed CAS thinking in the eThekwini Municipality

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Annexure 1: Coding used to classify responses to interview questions from respondents

	Question	Response	Code
1	How do you define policy?	Guiding Document.	A
		Rules that direct interventions.	B
		Statement of intent.	C
		Framework to guide collective action in order to achieve a common goal or goals.	D
		How the organisation should consistently respond or undertake specific tasks to address goals.	E
		The people's (general community) will.	F
		It is the accepted authority to implement.	G
2	What is the current status quo of Climate Change Mitigation Policy?	International agreements.	A
		National White Papers and Acts that focus on climate change and energy.	B
		Legislation.	C
		Provincial gap.	D
		Local policies and strategies.	E
		Transport sector has a lot of Mitigation potential.	F
		Green economy linked to Climate Change Mitigation.	G
		Not Sure.	H
		Quantified reduction.	I
		Unquantified reduction.	J
		Good policy should be comprehensive.	K
		Bridging technologies needed.	L
		Secondary policy.	M
		EThekwini Municipality started a long time ago in climate change activities.	N
		Locally is a mess.	O
		Got onto the climate change issue late.	P
		Little policy on Climate Change Mitigation at a Cluster level (HS&I).	Q
		Guide lower level documents and plans.	R
		Knee jerk reaction to crisis.	S
		Does exist.	T
		Currently being worked on.	U

		Difference between policy at a council level and at a unit or cluster level.	V
3	What is policy supposed to accomplish?	Provide a coherent vision including understanding and direction of what needs to be done.	A
		Provides an indication as to the degree of success of implementation.	B
		Impetus for the creation of an implementation plan.	C
		States the resources needed to achieve objectives.	D
		Acts as a strategic action plan.	E
		Assist in achieving specific results.	F
		Directs work effort.	G
		Provides guidance.	H
		Working within higher levels of service delivery.	I
		Non-compliance punishment.	J
		Compliance motivators.	K
		Reduction of Carbon emissions.	L
		Reinforce other pieces of policy and strategy.	M
		Official position of the Municipality.	N
		The intent of what people believe is best for them.	O
		Consistency and fairness.	P
		Provide a high level understanding of the issue.	Q
		Identify the core issues.	R
4	What are the important aspects to take into account when formulating policy?	Understand current situation.	A
		Other City policies.	B
		Policy should be developed as a result of a need.	C
		Policy should not be developed in isolation.	D
		Top-down approach for policy formulation is not effective.	E
		People.	F
		Communication with people.	G
		Situational analysis.	H
		Research.	I
		Institutional aspects.	J
		Finances.	K
		Technical consideration.	L
		Available skills of people that will implement the policy.	M
		What is being done at the moment.	N

		What you want to achieve.	O
		Plan to achieve objectives.	P
		Knowledge of subject matter of key stakeholders.	Q
		Likely impacts the policy will have.	R
		Risk assessment.	S
		Political leadership.	T
		Council decisions.	U
		When elections are taking place.	V
		Clear purpose and what it is not.	W
		Clear process.	X
		Participation must be robust.	Y
		Who the audience is.	Z
		Enablers and Drivers of the policy.	AA
		Take into account different demographics.	AB
		Outcome.	AC
		Opportunities.	AD
		Policy document must be written properly.	AE
		Do not reinvent the wheel.	AF
		Legal frameworks.	AG
		Diverse position of stakeholders.	AH
		Self adapting and not dogmatic.	AI
		Terms of reference for authority or limitations.	AJ
		Practicability.	AK
		Consult widely.	AL
		Must be done with drafts.	AM
5	How do national and provincial laws, strategies and policy guide the policy making process at the local Climate Change Mitigation level?	They do not guide local policy.	A
		Provincial is silent on Climate Change Mitigation issues.	B
		Local needs not well articulated in national policies.	C
		DCCS link to National White Paper is thin.	D
		National and Provincial policies overrule Municipality's.	E
		Acts as a cornerstone for Municipalities.	F
		Local policies cannot be less rigorous than national or provincial.	G
		Local has to comply with national and provincial policies.	H

		Local has to align with national and provincial policies.	I
		National guides provincial which guides local.	J
		Limits what local government can do.	K
		Top-down approach being used, does not work well.	L
		National might not take into account the different abilities of various municipalities.	M
		Nothing is supposed to conflict with national and provincial.	N
6	What are all the important impacts of policies, strategies and laws that do not align over the 3 level of government?	Too early to tell.	A
		Cause confusion.	B
		Cause conflicting goals.	C
		Lead to multiple objectives.	D
		Will result in interference.	E
		Chaos.	F
		Excessive time in meetings to resolve discord.	G
		Not looking at the picture holistically.	H
		It will be hard to motivate for support.	I
		National and Provincial needs to catch up to local activities.	J
		Ineffective existing national and provincial policy.	K
		Disaster for co-operative governance.	L
		Both negative and positive.	M
		Litigation between different levels of government.	N
		The country will not be managed well, will not be sustainable and goals will not be achieved.	O
		National and provincial mandates on municipalities with limited resources.	P
		Others will end up undertaking activities to accomplish objectives.	Q
		Waste of resources.	R
		Cancels out each other's efforts.	S
		Lack of action because of uncertainty or confusion.	T
		Fragment and divide society.	U
		Unenforceable.	V
		Waste of managerial time and effort.	W
		Disorientates and conflicts with stakeholders.	X
		Frustration.	Y
		Poor view of government will arise.	Z
		Not conducive for development.	AA

7	What are all the aspects that have an impact on policy formulation?	People.	A
		Knowledge and competency of key officials.	B
		Pressure from Civil Society and Private Organisations.	C
		Politicians or political objectives.	D
		Economic interests.	E
		Institutional interests.	F
		Social aspects.	G
		Socio-Economic-Environmental balance.	H
		Always opposition to change.	I
		Impact of policy.	J
		Affordable.	K
		Legal parameters.	L
		Level of awareness of political leadership and knowledge.	M
		Employment and income.	N
		Buy-in from stakeholders.	O
		Bi-lateral agreements.	P
		Where you are now, where you want to go, how long will it take to get there.	Q
		Any potential hindrances.	R
		Will of the Municipality's top management.	S
		Other existing policies.	T
		Specific events.	U
		Community's culture or worldview.	V
		Current states and perceptions of sovereignty that will result as a result of the influence of the policy.	W
		Poorly qualified authors of the policy.	X
		Ambiguity.	Y
		Note responding to real issues.	Z
		Will of the people.	AA
		Little support.	AB
8	What is the intended outcome of policy formulation and the time frame that it is applicable to?	Long term 50 years – Plan.	A
		Short term 1 year – Plan.	B
		Climate Change Mitigation – probably 20 years.	C
		Long term policy is vague.	D
		No set time frames.	E

		MFMA – financial commitments cannot exceed more than 3 years.	F
		Long term 20 years – Plan.	G
		IDP 5 years.	H
		6 months to 1 year for formulation.	I
		Policy that has a life span.	J
		Policy that is not affected by time.	K
		Policy that is time dependent.	L
		1 month if it is clear, much longer with consultation for formulation.	M
		Normally 12 to 18 months.	N
9	Do current political objective have a vast impact on policy formulation?	No.	A
		Irony, political agenda might be the same.	B
		Will of the government will surely have an impact on policy.	C
		While some policies are administratively driven, others are politically driven.	D
		Yes.	E
		Difference between what is put down on paper and what happens behind the scenes.	F
		Depends on the nature of the subject.	G
		It should be because political parties are elected.	H
		Not a vast impact.	I
10	What are the current limitations of policy making?	People (especially officials) are too busy to have input.	A
		People ignore policy.	B
		Policies are generally too broad.	C
		Poor monitoring and evaluation.	D
		Redevelopment of policies because of the perceptions of ineffectiveness of the policy.	E
		People think short term; climate change is a much longer term issue.	F
		People that are making policy are not educated.	G
		Policy makers that are not knowledgeable.	H
		Insufficient skilled people.	I
		Political.	J
		Lack of direction.	K
		Other problems that are a priority.	L
		When people are under pressure they tend to fall back on what works.	M
		Local government undertakes restructures too often.	N
		Uncertainties.	O

		Not participative.	P
		Not instructive.	Q
		Illiteracy of affect people.	R
		Unemployment.	S
		Not looking into the future.	T
		Sufficient time for implementation and to comment on draft policy.	U
		Understanding if the policy is implementable.	V
		Policy that tries to respond to multiple objectives.	W
		Disjuncture between future reality and policy.	X
		Constitution and legislation.	Y
		Continual buy-in.	Z
		Inflexible and dogmatic policy makers.	AA
		Not enough feedback.	AB
		No implementation of policy.	AC
11	What are the current aspects that aid policy making?	EThekwini Municipality has a dedicated policy development Unit.	A
		People not participating.	B
		EThekwini Municipality's Human Resources Skills.	C
		Staff capacity.	D
		Relationship with other departments within the eThekwini Municipality.	E
		Need to change from international pressure.	F
		Committed people.	G
		People that have skills and vision.	H
		High level support.	I
		Major weather impacts can act as a catalyst to stimulate action.	J
		Pressure from civil rights groups or residents.	K
		Leadership from the City Manager and Deputy City Managers.	L
		Policy writers.	M
		Technology.	N
		Modernisation.	O
		Globalisation.	P
		Clear view of what to achieve.	Q
		Political support.	R
		Strategy and policy must support each other.	S

		Well developed communication network.	T
12	What theoretical references are consulted when formulating policy?	It is policy specific.	A
		Template from GIPO.	B
		Applied research.	C
		Academic research.	D
		Grey literature.	E
		Stakeholder engagement.	F
		Review of draft policy.	G
		Pilot project (proof of concept).	H
		Depends on political marker and framework.	I
		Activities should be outcomes based and incorporate systems theory.	J
		Legislation and Acts.	K
		Bi-lateral agreements.	L
		None, it is more philosophical.	M
		Best practice.	N
		What top management has articulated though various documents (vision, mission goals).	O
		Institutional knowledge is very important.	P
		Informal agreements that are not officially documented.	Q

Table 3: Coding used to classify responses to interview questions from respondents

Annexure 2: Findings from research per respondent using coding from Annexure 1 / Table 3

Respondent	A	B	C	D	E	F	G	H	I	J	K
1. How do you define policy?	A,B	C	B	B	D	D	A	E	A,F	G	C
2. What is the current status quo of Climate Change Mitigation policy?	A,B,C,D, E,F,G	H,I,J,K, L	H,M	E,N	H	O,P,Q	R,S	T	U	H,T,V	T,M
3. What is policy suppose to accomplish?	A,B,C,D	E,G	F,H	D,G,I	F,G,J,K	H,L	G,M	G,N	O	P	C,Q,R
4. What are the important aspects to take into account when formulating policy?	A,B,C,D, E,AG	F,G,H,I, J,K,L,M	B,F,I,N, O,P,Q	Q,R,S,T, U,V,AD	A,W,X,Y, Z	F,P,Z, AA,AB	H,P,S,AC, AD	O,P,W,Y, AC,AE, AF,AG,AL	P,W,AH, AI,AJ, AK	C,O,AL, AM	C,Q,R, AK
5. How do national and provincial laws, strategies and policy guide the policy making process at the local Climate Change Mitigation Level?	A,B,C,D	B,E,F	G,H	H,I	A,J	K,L,M	N	H	F,J,K	J,N	I,J
6. What are the important impacts of policies, strategies and laws that do not align over the 3 levels of government?	A	B,C,D,E	F,G,H	I,J,K	L	M	N,R	O,P,Q,X	B,R,S,T, U	B,V,W,X	B,Y,Z, AA
7. What are all the aspects that have an impact on policy formulation?	A,B,C	D,E,F,G, H,I	J,K,L,N, AA	D,E,M,N	A,B,O	D,E,P,T	B,Q,R	B,L,Q,S, U	B,D,V,W	A,L,O	X,Y,Z, AB
8. What is the intended outcome of policy formulation and the time frames that it is applicable to?	A,B,C	D,E	E	F	G,H	I	E	E,I	J,K,L	M,N	E,N

Respondent	A	B	C	D	E	F	G	H	I	J	K
9. Do currently political objectives have a vast impact on policy formulation?	A	B	C,D	E,F	A,E,G	E	E	D,E	E,H	I	E
10. What are the current limitations of policy making?	A,B,C,D,E	F	G,H,I,J,K,L,M	H,I,N,O	P,Q	R,S	H,J,T	U,V,AA,AB	W,X	Y,Z	AC
11. What are the current aspects that aid policy making?	A,B,C,D,E	F,G	C,H	I,J,K	L,M	K,N,O,P	Q,R,S	D,L	J	T	L,R
12. What theoretical references are consulted when formulating policy?	A,B	C,D	C	D,E,F,G,H	I,J	D,K,L	M	K,N,O,T	K,N,T	K,P,Q,R,T	N,S,U

Table 4: Findings from research per respondent using coding from Annexure1 / Table3

Annexure 3: Ethical Clearance Approval Letter

UNIVERSITY OF
KWAZULU-NATAL
INYUVESI
YAKWAZULU-NATALI

4 June 2013

Mr Magashen K Naidoo 210549919
Graduate School of Business & Leadership
Westville Campus

Protocol reference number: HSS/0406/013M
Project title: Informing Climate Change Mitigation Policy: An eThekwini Municipality Perspective

Dear Mr Naidoo

Expedited approval

I wish to inform you that your application has been granted Full Approval.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. Please note: Research data should be securely stored in the school/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Professor U Bob [Chair] and Dr S Singh (Deputy Chair)

/px

cc Supervisor: Dr Stan Hardman
cc Academic Leader Research: Dr SA Bodhanya
cc School Administrator: Ms W Clarke