

A Legal Opinion on Mitigation and Adaptation on Air Pollution Strategies for Local Governments in South Africa

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Abstract—This paper presents an overview of the foundation and evolution of environmental related problems in local governments with specific reference on air pollution in South Africa. Local government has a direct mandate in terms of the Constitution of the Republic of South Africa, 1996 (hereafter, the Constitution). This mandate to protect, fulfil, respect and promote the Bill of Rights by local governments in respect of the powers and functions creates confusion around the role of where a local government fits in, in addressing the problem of climate change in South Africa. A reflection of the evolving legislations, developments, and processes regarding climate change that shaped local government dispensation in South Africa is addressed by the notion of developmental local governments. This paper seeks to examine the advances for mitigation and adaptation regulation of air pollution and application in South Africa. This study involves a qualitative approach that will involve South African national legislation as well as an interpretation of international strategies. A literature review study was conducted to undertake the various aspects of law in order to support the argument undertaken of mitigation and adaptation strategies. The paper presents a detailed discussion of the current legislation and the position as it currently stands, as well as the relevant protections as outlined in the National Environmental Management Act and the National Environmental Management: Air Quality Act. It then proceeds to outline the responsibilities of local governments in South Africa to mitigate and adapt to air pollution strategies.

Keywords—Adaptation, climate change, disaster, local governments, mitigation.

I. INTRODUCTION

THE Constitution of the Republic of South Africa, 1996, contains different sections that covers the Bill of Rights; however, for this study, the focus will be on section 24 that protects the environmental right of individuals. The environmental right determines that each citizen of the Republic has a right to an environment which is not harmful to their health and well-being. It further entails that the environment must be protected for present and future generations through sustainable means [2]. To understand what the environment consists of and how to protect it, one should first look at the definition of the environment. The 'environment' according to section 1 of the National

Environmental Management Act (NEMA) means: 'the surroundings within which humans exist and that are made up of:

- i. the land, water and atmosphere of the earth;
- ii. micro-organisms, plant and animal life;
- iii. any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being' [19].

To protect the environment, it supposes that everyone should strive to achieve sustainable livelihoods. This means that sustainable livelihoods can be achieved when the livelihood is maintained or enhanced and the local and global asset on which the person depends has a net beneficial effect on other livelihoods. This means that a livelihood will be sustainable if it can cope and recover from the stress and shocks and still provide for future generations [1]. Local governments in South Africa have the objective to deliver services to communities in a sustainable way, and therefore also have the responsibility to protect the environment for a sustainable livelihood [14].

The climate of the earth remained consistent in certain places, however in the last century there has been a continued warming of the global atmosphere [23]. The effect that climate change has on the environment includes an increase in global average air and ocean temperatures, melting of ice, and the rise of global average sea levels. The question that needs to be answered is, whether climate change could be seen as a disaster. In terms of section 1 of the Disaster Management Act 57 of 2002, a disaster means 'a progressive or sudden, widespread or localised, natural or human caused occurrence which, (a) causes or threatens to cause: (i) death, injury or disease, (ii) damage to property, infrastructure or the environment, or (iii) disruption of the life of a community; and (b) is of a magnitude that exceeds the ability of those affected by the disaster to cope with its effects using only their own resources' [5].

In considering the definition of a disaster, it can be concluded that climate change can be classified as a disaster, due to the fact that it causes damage to the environment and disruption to the life of communities because it can be directly related to drought and floods (which causes death, injury and diseases).

The following part of the paper consists of an identification of the legislative framework for the effective management of

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climate change in South Africa. The Constitutional framework, environmental framework and local government framework will be analysed according to the management of climate change in South Africa.

II. LEGISLATIVE FRAMEWORK

The Constitution in Schedule 4(B) and Schedule 5(B) provides for the functional areas where national and provincial legislatures have legislative competence. In terms of climate adaptation and mitigation competence, it will fall under Schedule 4(B) of the Constitution since it makes provision for 'air pollution' [2]. Therefore, local governments have executive authority, which means that a local government has the right to administer the matters listed in Schedule 4(B) and Schedule 5(B) of the Constitution as well as any other matter that are assigned to it by the national or provincial legislation [2]. Local governments have executive authority as in terms of Schedule 4(B) to administer air pollution regulation in South Africa. This includes the governance of legislation, regulations and other measures as defined in the Constitution.

NEMA is the national framework act [21] which provides for co-operative environmental governance. Local environmental governance can be defined as 'the management process executed by local government and communities to holistically regulate human activities and the effects of these activities in their own and the total environment (including all environmental media, and biological, chemical, aesthetic, cultural and socio-economic processes and conditions) at local levels; by means of formal and informal institutions, processes and mechanisms embedded in and mandated by law, so as to promote the present and future interest human beings hold in the environment'. This management process necessitates a collection of legislative, executive and administrative functions, instrument and ancillary processes that could be used by local government, the private sector and citizens to pursue sustainable behaviour within the community as far as products, services, processes, tolls and livelihoods are concerned, both in a substantive and procedural sense [6]. In interpreting the definition as given by Du Plessis, it supposes that sustainable livelihoods play an important factor in a local government mitigating and adaptation of climate change in South Africa.

The 2004 National Environmental Management: Air Quality Act 39 (NEM:AQA) strives to regulate air quality in South Africa by protecting the environment through reasonable and other measures to prevent pollution and ecological degradation. It further strives to secure ecological sustainable development in promoting justifiable economic and social development in South Africa. NEM:AQA provides for national norms and standards to regulate air quality by all three spheres of government, which places a direct duty on local governments to regulate air quality in South Africa. The Minister of Environmental Affairs in South Africa has the responsibility to establish a national framework for achieving the objectives of NEM:AQA and this framework is binding on all organs of state, including local governments [20].

In consideration to climate change regulation in South

Africa, NEM:AQA will play an important role. Section 15(2) of NEM:AQA places a direct duty on local governments to include an air quality management plan (AQMP) in its integrated development plan (IDP) to regulate air quality. Although NEM:AQA stipulates the requirement of the AQMP, there are no clear guidelines to local governments in terms of what should be included in the AQMP [7]. According to Engelbrecht and Van der Walt, there is a lack of air quality management infrastructure and experienced qualified staff to develop, implements and to maintain the air quality management plans [7]. This however is not the only problem. Local governments also face the problem of financial constrains in managing air quality in South Africa. In managing the AQMP, there is a lack in public awareness and the understanding of the communities of the impact of air pollution. Political institutions do not address the problems, which then vary depending of the level of public concern [15]. Section 16 of NEM:AQA gives a broad outline of the contents of the AQMP, which forms part of the demarcation of priority areas where standards are not met.

It is important to note that NEM:AQA has no express reference to climate change; however, it can be interpreted that an atmospheric emission license must contain a greenhouse gas emission measurement and that it must be reported [20]. The licensing authority will grant the authorization, when an application is consistent with NEM:AQA and other legislations, policies, notices, and section 2 principles as set out by NEMA [20]. If the authorization is given to a party, it will cause the party to be monitored. Therefore, if a party is monitored and the party adheres to the legislations, policies, documents and notices, it will support South Africa's adherence to the commitment in terms of the UNFCCC.

In terms of the old dispensation in South Africa, the local governments were merely an administrative arm of national and provincial governments, however this changed dramatically with the new dispensation. The three spheres of government are equal partners in governance. This is manifested in the case of *Fedsure Life Assurance Ltd and Others v Greater Johannesburg Transitional Metropolitan Council and Others* 1998 (12) BCLR 1458 (CC) where the court states that:

'Under the interim Constitution (and the 1996 Constitution) a local government is no longer a public body exercising delegated powers. Its council is a deliberative legislative assembly with legislative and executive powers recognised in the Constitution itself. Whilst it might not have served any useful purpose under the previous legal order to ask whether or not the action of a public authority was "administrative", it is a question which must now be asked in order to give effect to section 24 of the interim Constitution and section 33 of the 1996 Constitution' [10].

The original legislative powers of local governments are derived from Schedule 4(B) and Schedule 5(B) of the Constitution. Other than the original powers as referred to in Schedule 4(B) and Schedule 5(B), the local governments can

also receive powers through assignment, delegation and agency. In terms of 'assignment', it supposes that the transfer of the authority to a local government over a function or a competence that falls outside Schedule 4(B) and Schedule 5(B) as functional areas. This assignment may take the form of a legislative or executive authority and can be transferred to a local government across South Africa. This means that national and provincial governments may assign a matter listed in Schedule 4(A) or Schedule 5(A) to a developmentally orientated local government [3]. This includes the assignment from national and provincial government to local government matters such as agriculture, disaster management, environment, nature conservation (excluding national parks, national botanical gardens and marine resources), pollution control and soil conservation [2]. Climate change has a direct impact on the matters listed above and therefore, local government will play an important role in addressing the matter of climate change if it is assigned to them by the national or provincial government. The Constitution also makes provision for delegation of powers in section 238(b). This section provides that an executive organ of state in any of the three spheres of government may delegate any power or function to any another executive organ of state. The delegation usually refers to the mechanism of transferring service provider responsibilities. Local governments will then be bound by the delegated functions within the framework of legislation. This is an important factor due to the fact the climate change can be addressed by the sphere of government that is the closest to the individual. Finally, agency supposes that there can be a relationship between the different organs of state according to section 238(a) of the Constitution. This means that the local government can act as an agent in the fulfilling of responsibilities of other organs of state. The agency arrangements will normally be concluded on an annual basis and by agreement. The problem with delegation and agency is that they do not transfer the authority role. This does not make any room for policy initiation or any creativity on the part of the local government in order to develop their strategies to meet the developmental mandate and to minimise the occurrence of climate change [3].

Local government, when performing their duties and responsibilities, must strive to be developmental. This means that a local government must strive to work with citizens and other groups of the community to find sustainable livelihoods to meet social, economic and material needs and to improve the quality of their lives [27]. The characteristics of a developmental local government include:

- The maximisation of economic growth and social development. This idea of sustainable livelihoods can be identified in this characteristic; however, climate change will negatively affect economic growth.
- Integration and coordination mean that local governments will integrate and coordinate developmental activities of other states and non-state agents in the municipal demarcation. This will suppose that climate change can be best addressed at the local government level; however, local governments struggle to perform their own functions

as determined by the Constitution. Therefore, it will be problematic if the local governments take on more responsibility. Ultimately, local governments will not mitigate climate change because of the responsibilities.

- Democratic development. Local governments want to achieve public participation in order to achieve the ideal place that they want to live in. Citizens are and guaranteed an environment that is clean and healthy, and the local government must strive to achieve this objective. Therefore, by addressing the problem of climate change, it will provide the characteristic, to some extent, of democratic development.
- Leading and learning. Local governments must strive to build social capital, the finding of solutions to problems that will promote sustainability and stimulate local political leadership [3].

The characteristics of a developmental local government are not only fundamental to understanding the developmental mandate of a local government but are also important in interpreting the Constitutional mandate of local governments. To achieve the objective to be developmental, the local government must work and stick to their IDP. Therefore, if a local government has AQMP in their IDP, the objectives of climate change can also be achieved; if not fully, they will at least be addressed.

The next part of this paper discusses the international application of legislation and treaties, and whether South Africa will be bound by these treaties or conventions. A Constitutional framework will be given, where the international obligations towards climate change will be discussed.

III. INTERNATIONAL APPLICATION

The Constitution of the Republic of South Africa refers to the application of international law in terms of section 233. Section 233 states that if legislation is interpreted, the courts must prefer a reasonable interpretation of that legislation that will be consistent with the international law over any alternative interpretation that is not consistent with international law. Section 231 further states that if there is an international agreement, it will bind South Africa after it has been approved by the resolution of the National Assembly and the National Council of Provinces. Section 39 of the Constitution stipulates that when interpreting the Bill of Rights, in this article, the focus is on section 24, every court, tribunal or forum must consider international law [2]. Therefore, if South Africa is a member of an international convention or treaty, the courts must interpret the legislation and apply it with the concurrence of the National Assembly and the National Council of Provinces in South Africa.

The United Nations Framework Convention on Climate Change (UNFCCC) is seen as the main international agreement on climate change. The UNFCCC was adopted at the Rio Earth Summit in 1992 and has been ratified by 195 countries. The UNFCCC strives to have cooperation between countries to work together to limit the global temperature increases and climate change, and ways to cope with the

impacts of increased temperatures and climate change [8], [9]. South Africa is a signatory state to the UNFCCC and is committed to reduce CO₂ emissions.

The Intergovernmental Panel on Climate Change (IPCC) which forms part of the Paris Climate Agreement, was created to reach global goals of climate mitigation and adaptation by countries. The fundamental goal of the IPCC is that countries will improve and reach their national emission reduction goals. South Africa is a member state of the IPCC. The IPCC was created to guide policymakers with regular scientific assessments on climate change in the country, including the impacts and future risks that climate change may have, and then to provide adaptation and mitigations options. The IPCC creates country reports based on the knowledge, measures and assessments that the nation has on climate change. The IPCC states that reduction must be met in order to reach the global goals. In order to meet the goal to lessen the increase of temperature of 1.5°C, the following measures must be included for example: less than 50% oil use, less than 67% coal use and less than 33% gas use [9], [11]. South Africa is also committed to reach the goal of at least lower the temperature by 1.5°C, because any increase in temperature globally will have a double effect in South Africa, which will then have an average temperature increase of 4°C.

IV. MITIGATION

In terms of interpreting climate change, the following words are synonymous to the meaning of climate change, namely: mitigation and adaptation. The United Nations (UN) describes mitigations as follows: 'Mitigation strategies refer to the efforts of humans to decrease or even to prevent emissions of greenhouse gases. Mitigation therefore can be interpreted by using new technologies and renewable energies to make older equipment more energy efficient and have less impact on the environment or to change the management practices that are implemented by governments or the behaviour of consumer. It can be a difficult process as to plan for a new city, or even as effortless as improvements to a cook stove design. Efforts underway around the world range from high-tech subway systems to bicycling paths and walkways' [24]. South Africa has committed to the reduction of greenhouse gas emissions [13]. The National Climate Change Response White Paper, 2011, is committed to mitigation strategies in South Africa as seen below:

'South Africa will build the climate resilience of the country, its economy and its people and manage the transition to a climate-resilient, equitable and internationally competitive lower-carbon economy and society in a manner that simultaneously addresses South Africa's over-riding national priorities for sustainable development, job creation, improved public and environmental health, poverty eradication, and social equality. In this regard, South Africa will:

Effectively manage inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity.

Make a fair contribution to the global effort to stabilise GHG concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner' [18].

V. ADAPTATION

Adaptation to climate change means the anticipation of adverse effect that climate change has and to take appropriate action to prevent or to minimize the damage that climate change can cause, or to take advantages of the opportunities that climate change may bring [8]. The UN Climate Change Adaptation Unit has identified 4 areas of adaptation namely:

- Ecosystem-based adaptation which aims to implement project that will utilize biodiversity and the ecosystem services that will form part of a holistic adaptation strategy;
- Knowledge, analysis and networking adaptation that will spread the vital adaptation knowledge through well-connected global networks;
- World adaptation science programme that will provide an interface between the adaptation research community and the decision-makers;
- Access to adaptation finance that aims to help countries to gain access to finances for building a resilient and national capacity [24].

The White Paper identifies adaptation sectors namely: water, which is seen as the primary option through which the impact that climate change has will be felt by people the most, ecosystems as well as economies; agriculture, which climate change will have a dramatic effect on domestic food security and lastly human health [13]. It can be argued that climate change adaptation will be best managed by provinces and local governments. The *Principle of Subsidiarity* means that the national government should not exercise functions that can be exercised best by a smaller and lesser body such as a local government. This principle can even be explained to stipulate that governance should take place as close as possible to the citizens [4]. Therefore, when implementing the *Principle of Subsidiarity*, the state shall only take action in so far as the objectives of the proposed action cannot be effectively performed by the communities. The conclusion that can be reached is that adaptation should preferably take place at local government level (not only at local government level), since the communities can escalate climate change problems must faster to the local governments.

As seen in this paper, climate change can be interpreted as a disaster. This means that local governments must establish and implement a framework within their area of jurisdiction [5] to address the problems that are associated with climate change. The following paragraph will identify the problems caused by climate change if it is not addressed in South Africa.

VI. PROBLEMS IF CLIMATE CHANGE IS NOT ADDRESSED

Global warming will be the greatest cause of extinction of

different species. In terms of the Intergovernmental Panel on Climate Change (IPCC), an average 1.5°C rise in the temperature may put 20-30% of different species at risk of extinction [29]. The following will be some of the problems that will exist in South Africa:

- In terms of rainfall, it will either cause too much rain, resulting in floods or it can bring too little rain, which will cause droughts and wildfires. This will have a dramatic effect on some species, such as the African elephant. The African elephant can drink up to 225 litres of water per day and any changes in weather patterns may cause the elephants to travel to remote areas in search of water. This effect can cause the elephants to travel outside protected areas and encounter people. If encountered by people, the elephants can be hurt and *vice versa* is also true.
- The effect of climate change on oceans. The oceans absorb carbon dioxide and prevent it from accumulating in the upper atmosphere. Due to an increase in water temperatures and higher concentrations of carbon dioxide, oceans will become more acidic [25], [29]. If carbon dioxide dissolves in the oceans, the ocean water becomes more acidic and the pH level in the ocean drops. This causes a change in the ocean's chemistry and the natural buffering of the ocean cannot keep up with the water raising acid level. Some shells of marine animals are dissolving because of the acid levels [25], [22]. This acidic level in the water means that the rising temperature at the coast will be warmed up by one degree within the next five decades. The northern interior will warm up by over 4°C [12].
- Carbon dioxide (CO₂) is an element that is necessary for plants and trees to grow. Forests absorb carbon dioxide during the photosynthesis phase and produce oxygen as a by-product of photosynthesis. Therefore, due to the increase of carbon dioxide in the atmosphere, forests can help in mitigating the effects of carbon dioxide in the air [25], [26]. Forests, like oceans, absorb carbon dioxide, one of the main causes of greenhouse gases which influence global warming. Forests must be protected by national government in cooperation with local governments. The effect that climate change may have on forests includes the gradual retreating of tree lines. The retreat of forests or their decline will result in reduced levels of carbon dioxide stored by trees and more greenhouse gases will be emitted to the atmosphere. Biodiversity will also be influenced by climate change due to the fact that there will be a change in the biosphere, which can also cause the extinction of different bio species.
- Climate change also has a negative impact on the world's water systems by creating more floods and draughts. The warmer air caused by climate change can hold a higher water content, which will influence rainfall patterns and result in more extreme weather patterns. Various rivers, lakes and dams provide drinking water to people and animals which are also vital for agriculture and industries. The current freshwater environments are put under

immense pressure since there is drainage, dredging, damming, pollution, extraction, silting and different invasive species that is taken over [25], [29].

- Temperatures will continue to rise. Since human-induced warming is superimposed on a natural varying climate, this will cause the temperature to rise unevenly and dramatic temperatures to appear in certain places, resulting in draughts and heat waves to continuing, lasting for longer periods and that will also be more intense [17]. The effect of higher temperatures on human beings has not been investigated in this paper, but definitely must be a reason for concern.
- Rooibos is a leguminous fynbos which thrives in sandy, low nutrient soils that are endemic to South Africa's Cape Floral region. Rooibos was developed from being a 'poor man's' tea to one of the most sought-after teas in Europe, North America and Japan. [12] The effect that climate change has on fynbos is problematic. However, for rooibos to thrive, it is associated with nitrogen fixing bacteria, endemic pollinators, mycorrhizal fungi and other predatory insects. The production of rooibos plants was severely affected by rainfall patterns which caused draughts; as well, the high temperatures stress the rooibos plants and the necessary bacteria, pollinators and fungi were driven away by the severe conditions. Rooibos farmers decided to adapt to severe weather patterns by improving soil organic matter to help retain moisture in the soil and feed the soil organisms [16]. Therefore, it can also be seen that climate change has a severe impact on our economies, since South Africa cannot export rooibos tea if there is a loss in production.

VII. CONCLUSION AND RECOMMENDATIONS

Local government spheres remain an important role player in ensuring that sound and solid economic growth, developmental environmental services and climate change problems are addressed in South Africa. South Africa is well informed about the problems that climate change brings. Climate change, seen as a disaster in terms of the Disaster Act, could be interpreted that each local government must establish and implement a framework on how to ensure that an approach to climate change is taken in the area of jurisdiction. This can be done through an AQMP; however, the details of this plan must be well communicated to national and provincial government.

It is further recommended that the AQMP is aligned with provincial and national objectives as set out in terms of NEMA and NEM:AQA, and implemented as soon as approval is received. It may be an option that the community should be able to hold individuals and managers within, as well as the local government as a whole, jointly and individually (the municipal manager/mayor in their own capacity) responsible in the event that an AQMP is not implemented and managed.

The WWF sets out 10 things that can be done in order to save our planet from climate change:

- Use your voice;
- Be informed;

- Be political;
- Travel responsibly;
- Eat sustainably;
- Reduce waste;
- Watch what you buy;
- Find ways to donate;
- Make a pledge; and,
- Volunteer for your world [28].

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