The Efficacy of Municipal Spatial Plans Implementation Towards Mitigating Climate Change: South African Institutional Challenges

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Abstract: The purpose of the paper is to debate the efficacy of municipal spatial plans implementation towards climate change mitigation in urban areas. Post 1994 in South Africa, municipal spatial plans have been very integral towards shaping the growth of most cities and the facilitation of urban renewal. The densification of urban population has resulted in multifaceted challenges such as informal settlements, intensive energy consumption, traffic congestion, and increased greenhouses gas (GHGs) emissions. Spatial plans provide cities with the potential to address the increasing emissions which contribute to climate change through the process of urban renewal which helps improve the environmental condition. Therefore, the effective implementation of municipal spatial plans has a notable potential of significantly contributing towards climate change mitigation through the provision of energy efficient settlements, sustainable transport modes, improved urban planning and renewal, and the usage of renewable energy resources. The efficiency in the implementation of municipal spatial plans informs sustainable transport to reduce emissions. However, within the context of spatial planning, environmental protection and preservation mechanisms include, *inter alia*, the measures to mitigate climate change. Section seven (7) of the Spatial Planning and Land Use Management Act (SPLUMA) No. 16 of 2013 stated that plan-making and implementation processes should be designed in a manner that aims to mitigate negative environmental impacts such as climate change. However, it is often difficult to balance the trade-offs between the competing ideologies during implementation of the urban planning process and urban renewal. The paper is purely conceptual and relied largely on the review of existing literature to underpin the argument and accentuate the efficacy of municipal spatial plans implementation towards climate change mitigation. The paper concludes that for municipal spatial plans, which encompass urban planning and urban renewal, to be implemented effectively in an attempt to mitigate climate change, there must be proper coordination and alignment of policies and plans of diverse sectors such as housing, transportation and energy to reduce emissions.

Keywords: Cities, Climate change, Spatial plans, Urbanisation**,** Urban Planning, SPLUMA

1. Introduction

Over the past decades, spatial planning was used as a mechanism within which the design of urban centres can be conditioned, regulated and controlled (McClure & Baker, 2018). Recently on the global scene, spatial planning laws have changed for covering the broader areas that strive to integrate planning systems from diverse sectors such as transportation, energy and waste disposal and housing (Wang, Huang & Huang, 2018; Busayo, Kalumba & Orimoloye, 2019) to address societal issues including climate change mitigation and adaptation. A body of literature have posited that urbanisation and cities are contributing to multiplicity of urban environmental challenges such as land degradation, higher emissions, traffic congestion and climate change (McClure & Baker, 2018; Mokoele & Sebola, 2018; Mogano & Mokoele, 2019). Urban areas and cities are mostly vulnerable to the harsh effects of climate change. According to Mogano & Mokoele (2019:69), "climate change is an inevitable phenomenon and most dangerous environmental problem the global village is currently facing". Throughout the world, organisations and countries are grappling with the adaptation and mitigation of climate change (Roy, 2009; Vasilevska, Vranic & Marinkovic, 2014; Moriarty & Honnery, 2015; Mokoele & Sebola, 2018; Wang *et al*., 2018; Mogano & Mokoele, 2019). In keeping with the mitigation process, spatial planning policies, urban planning, urban renewal and programmes were initiated to address the contemporary urban problems and controlling GHGs emissions (McClure & Baker, 2018). The implementation of spatial plans is significant in ensuring the implementation of energy efficient settlements, sustainable transport modes and renewable energy resources to curb GHGs emissions (Wang *et al*., 2018). Therefore, spatial

planning is often regarded as an essential area of making decisions on how land for commercial and residential activities is used and a fundamental tool in achieving development, sustainability and climate change mitigation.

In 2015, countries such as Germany, USA and South Africa signed a Paris agreement which stipulates that there should be a shift from heavy reliance on fossil fuels towards clean and renewable energy resources (Von Haaren & Vollheyde, 2019). Therefore, the spatial planning serves as a transformative instrument to ensure the implementation of new clean energy resources in urban areas. The United States of America and other nations see Paris Accord as posing a threat to economic growth and putting a permanent disadvantage to the country's economic development (Ameli & Brandt, 2015; Sanderson & Knutti, 2017). Ameli & Brandt (2015) argued that reducing GHGs emissions does not always impede economic growth. However, in Germany, the approach and application of spatial planning is supported by the legal frameworks to ensure the protection of the environment (Von Haaren & Vollheyde, 2019). The German spatial planning law (SPL) of 2009 posits that the local construction development and municipal zoning plans (Von Haaren & Vollheyde, 2019) must "contribute to securing an environment consistent with human dignity and be responsible for general climate protection" (Wendea, Huelsmanna, Martya, Penn-Bressela & Bobylev, 2010:865).

The spatial planning of spaces demonstrates a pro-active and futuristic procedure of reducing emissions which is key to climate change mitigation. The government of South Africa formulated Spatial Planning and Land Use Management Act (SPLUMA) No.16 of 2013 to ensure spatial resilience and efficiency in addressing environmental issues such as climate change and GHGs emissions (Busayo *et al*., 2019). However, the effectiveness of SPLUMA in addressing climate change depends on the intensity, political will and relevance of Municipal Spatial Development Framework (MSDF) towards prioritising environmental protection.

2. Theoretical Framework: Resilience Theory

Etymologically, resilience theory can be coined to the field of ecology which has made inroads into planning and cities discourse (Cosens, 2010). The etymological origin of the resilience theory is taken from an Italian word *resilio* which means the ability to bounce back (Cosens, 2010; Meerow & Newell, 2017). The connotation of the theory means the systems' ability to bounce back to its operational state post any perturbation. However, within the context of a city, resilience theory provides the notion of multiple equilibrium which means that the system will return to stability, but not to its original state. Therefore, cities must demonstrate its ability to bounce back and be operational post any climatic effects such as floods, and drought. Therefore, "Building resilience capacity through landscape and urban planning requires planners and designers to identify the stochastic processes and disturbances that a particular landscape or city is likely to face; the frequency and intensity of the events, and how the city can build the adaptive capacity to respond to the disturbance while remaining in a functional state of resilience" (Ahern, 2011:342). Resilience theory provides urban planners with an ideology within which planning for climate change adaptation and mitigation should be undertaken. It is therefore within this background that the paper relies extensively on the existing literature to review and conceptually debate the resilience of spatial planning and implementation of plans in the quest to mitigating climate change.

3. Spatial Planning in Africa

The spatial planning in Africa is basically categorised into two dimensions namely: the urban design and spatial distribution of development projects. Many African cities such as Accra, Lagos, Abidjan and Johannesburg are experiencing multiplicity of challenges such as congestion, and pollution which can be traced back to the planning systems which existed during their colonial periods. In Malawi, contemporary spatial planning challenges emanate also from the incapacity of the British colonial government to promulgate vibrant land use policies (Ryser & Franchini, 2015; Mwathunga & Donaldson, 2018). The end of the colonial periods has led to the densification of urban population whereby most African cities failed to adapt to a rate at which slums were growing. The Malawian informal settlements grew at a rate of 5.2% per annum, and this perpetuated the challenges encountered by urban planners (Ryser & Franchini, 2015). Zimbabwe as one of the countries which were colonised by Britain, which experienced densely populated urban areas (Chigudu & Chirisa, 2020). However, few years later

in Zimbabwe, spatial planning managed to bounce back and effectively guided the development of working areas, neighbourhoods and roads (Chigudu & Chirisa, 2020). The Zimbabwean spatial planning is currently helping in maintaining a harmonious environment in which the use of land is organised in a manner that conflicting land uses are separated (Muchadenyika, 2015). This has shown a considerable improvement in spatial planning of Zimbabwe as related land uses are now consolidated to contain pollution and reduce commuting distances (White & O'Hare, 2014). For instance, Mbare and Sunningdale residential areas in Harare are now located close to Graniteside industrial area with the intention of making it possible for people to reside close to their workplaces (Chigudu & Chirisa, 2020), thereby reducing transportation costs.

4. Spatial Plans Review in Terms of Climate Change

The structure and scope of spatial plans vary across countries. "Spatial plan is often regarded as a comprehensive guiding document used to shape spatial developments, perceiving the interrelations and impacts of spatial measures in a long-haul point of view" (Busayo *et al*. 2019:1). In the past decades, spatial plans were conditioned, regulated and controlled with the intentions of shaping urban centres (McClure & Baker, 2018). Reckien, Salvia, Heidrich, Church, Pietrapertosa and De Gregorio-Hurtado (2018) posited that the idea of locating spatial planning mainly in urban areas was after the realisation that cities are mostly vulnerable to climate change. The spatial organisation of human settlements upgrading plans can address climate change through mitigation and adaptation. It is worth noting that urban sprawl threatens environmental sustainability as people resort to deforestation to secure a residential area.

In the pursuit to climate change adaptation, spatial plans serve as a guideline which helps in shaping the location of informal settlements to ensure that they are resilient and basic services are readily available (Pieterse, Van Niekerk & Du Toit, 2018). In the United Kingdom (UK), the national spatial planning Act was promulgated to improve the dilapidated areas and solve the existing societal problems (Lund, 2016). However, the advocates of climate change mitigation criticised the UK's approach to spatial planning because it is focusing predominantly on climate change adaptation than mitigation. Therefore, to ensure environmental sustainability in urban areas, spatial plans should be implemented in a manner that aims to control population dynamics and manage urbanisation (Cobbinah, Erdiaw-Kwasie & Amoateng, 2015). Additionally, environmental sustainability can be realised through the reduction of electricity consumption, using solar systems and reducing traffic congestion. In Taiwan, urban spatial plans are used to determine the distributions and amounts of population to avoid crowded cities (Chang & Lin, 2016). However, the German Spatial Planning Act (GSPA) was promulgated to protect the open and green spaces (Wendea *et al*., 2010). Regional spatial planners should therefore ensure that the protection of open and green spaces is strictly applied in local development practice (Wendea *et al*., 2010). The protection of green and open spaces by local municipalities can thus control carbon dioxide emissions in cities as a follow-up outcome of residential development (Reckien *et al*., 2018). However, it should be noted that making provision for climate change mitigation within spatial plans does not automatically imply effective implementation of the plans. Making provision to address climate change within spatial plans must be supported by the municipal employee capacity, political will and the provision for funding.

4.1 South African's Spatial Plans Review in Terms of Climate Change

The South African urban planning processes are regulated by the SPLUMA, 2013. The rationale for promulgating SPLUMA was to provide a framework for planning and land use management in South Africa, while taking cognisance of the inclusive developmental, efficient and equitable spatial plans across all the spheres of government (Busayo *et al*., 2019). The objectives of this act are to promote economic and social inclusion; engender development and efficient land use; and ensure cooperation and collaboration among the spheres of government (Pieterse *et al*., 2018). Within the climate change discourse, collaboration of all spheres of government, private sector and ordinary citizens is pivotal. SPLUMA indicates that each of the three spheres of government ought to develop and adopt a Spatial Development Framework (SDF) (Afinowi, 2018) to promote efficient urban planning and urban renewal. Section 7(c)(ii) of SPLUMA states that spatial plans should be developed and implemented in a manner that aims to minimise negative environmental impacts such as climate change (Afinowi, 2018).

The local government is mandated to prepare and adopt a Municipal Spatial Development Framework (MSDF) to integrate, coordinate, align and express development plans and policies from different sectors within their jurisdiction (Pieterse *et al*., 2018). Municipal spatial plans are guided by the goal of MSDF to avoid duplication of efforts between sector departments such as, *inter alia*, transport and energy. It is argued that MSDF does not explicitly address climate change as it is incorporated within the broad environmental management (Odendaal & McCann, 2017). It is worth noting that although municipal spatial plans are developed, they will not explicitly address climate change for as long as MSDF categorises it within environmental management. It is clear that spatial plans stipulate that local government must ensure environmental management without an explicit reference to climate change. An inability to explicitly proclaim climate change in Integrated Development Plan (IDP), SPLUMA, MSDF and Integrated Urban Development Framework (IUDF) paint a blurry picture in an attempt towards climate change mitigation. Therefore, it becomes increasingly difficult to prioritise protection of the environment over development in developing countries like South Africa. The implementation of spatial plans in addressing climate change is complicated by multiplicity of development challenges that urban areas are facing. However, other local governments such as Cape Town Metropolitan Municipality has, in its MSDF, indicated that "it wants to achieve developmental outcomes such as more sustainable use of land and natural resources, lower carbon emissions, more efficient use of infrastructure; effective and efficient public transport systems and social amenities" (Cape Town Metropolitan Municipality, 2018:57). Odendaal & McCann (2017) further argued that the acknowledgement of climate change mitigation in MSDF should strengthen a call for producing a detailed spatial directive on how emissions are going to be cut, and indicative measurements for monitoring compliance and progress.

5. Institutional Barriers to Climate Change Mitigation

Cities in many parts of the world account for a considerable amount of GHGs emissions in the atmosphere (Reckien *et al*., 2018) because of the existence of diverse emitting sectors such as mining, housing, transportation and energy (Schoeman, 2015). Although municipalities recognise the reduction of GHGs emissions as a legitimate local concern, they often experience several institutional barriers that impede the translation of political will into policy action to mitigate climate change (Hull, Sehume, Sibiya & Sothafile, 2016). Local governments are confronted with multifaceted institutional challenges such as administrative capacity, political will, bureaucratic structure (Hull *et al*., 2016; Taylor, 2016), and the politics of climate change that impede the implementation of spatial plans in an attempt to mitigate climate changes.

5.1 Bureaucratic Structure

Climate change is a cross-cutting environmental problem which does not fit the way most city governments organise themselves as it transcends through multiple sectors (Taylor, 2016). Most urban municipalities are divided into several specialised divisions and departments with specific mandates. In most cases, officials from specific areas focus on their narrow activities and do not often interact with individuals in other departments or divisions (Fuentes-Bargues, Gonzalez-Cruz & Gonzalez-Gaya, 2017). The inability for municipal departments to integrate or synchronise their plans has contributed to lack of clear plans used to address GHGs emissions and mitigate climate change. Therefore, various departments solely focus on their constitutional mandate of providing the citizens with basic services at the expense of addressing climate change. However, the efforts to mitigate climate change through controlling and reducing GHGs emissions require good cooperation between individuals working in transportation, waste management, public works, health, utilities, air quality management and land-use planning who rarely meet and reach a common goal (Schoeman, 2015; Wang *et al*., 2018). The collaboration between these sectors can be enforced through the political will that supports climate change mitigation. The translation of political will into climate policy action advocates for the institutionalisation of the efforts to control GHGs emissions and designation of responsibility to co-ordinate climate-related activities across city governments (Taylor, 2016).

In cities such as Fort Collins and Denver in the US, climate change mitigation is placed under environmental department (Roberts, Fausch, Hooten & Peterson, 2017), while Madison rely on engineers and planners in public works department to control the GHGs emissions (Fuentes-Bargues *et al.*, 2017). Fuentes-Bargues *et al.* (2017) argued that

departments which are not traditionally viewing environmental protection as their principal mandate may less likely devote the necessary resources to robustly reduce the city's GHGs emissions. Of paramount importance, the political ideology has been realised as the contributing factor towards USA's unwillingness to adopt a robust climate change policy position. The liberal perspective is based on the notion that the country must focus on economy and development, and climate change as a natural phenomenon, it will deal with itself.

5.2 Administrative Capacity

In many developing countries such as South Africa, many municipalities have been found to lack adequate administrative capacity to formulate local programmes and policies for controlling GHGs emissions, reducing electricity consumption, traffic congestion and emissions from waste (Kabisch, Frantzeskaki, Pauleit, Naumann, Davis, Artmann, Haase, Knapp, Korn, Stadler, Zaunberger & Bonn, 2016; Krogstrup & Oman, 2019). Mitigating climate change at the local level is extremely time consuming because of the complex co-ordination process (Kabisch *et al*., 2016). Ideally, it is imperative that cities dedicate personnel to deal with climate change mitigation, rather than adding it to the tasks of already overworked officials (Kabisch *et al*., 2016; Haskins, 2017). Most cities in developing countries are unable to devote necessary resources to create such a position, particularly because the pressing issues on a city's agenda are often increasing (Kabisch *et al*., 2016). Most cities in developing countries are working on climate change adaptation as opposed to mitigation. This can be attributed to the municipal challenges to dedicate personnel who understand climate change discourses, and thus demonstrating inadequate capacity within the municipalities. Furthermore, it is essential that personnel dedicated to climate protection have adequate technical capacity for collection and analysis of data related to GHGs emissions at the local level, and implementing effective climate change strategies.

5.3 Budgetary Constraints

According to Krogstrup & Oman (2019), the reduction of GHGs emissions within cities requires the implementation of new climate-related programmes and policies. It is worth noting that the promulgation of clear policies, acts, legislations, and plans does not automatically translate to effective ways to address climate change. Budgetary constraints can be seen as a major impediment to the municipality and officials' ability to invest in GHGs reduction policies, projects and programmes. Environmental programmes in many communities are perceived as luxury expenditures and they often receive less priority in cases of budget shortfalls (Elijah & Odiyo, 2020). However, it is often difficult for officials in CCP to convince members of the city council to consider investing in energy conservation technology. Regardless of an argument that resources saved in energy costs will be used for reimbursement of the initial investment and even cater for future additional measures, institutions in charge of funds remain sceptical (Ameli & Brandt, 2015). Elijah & Odiyo (2020) indicated that if budget officials within a specified city are short-term thinkers, it is most likely that they will be sceptical of arguments provided by CCP officials. Cost-effectiveness is the most important criterion on which municipal councils make budgetary decisions (Haskins, 2017). Thus, it is significant for officials requesting money for implementation of climate-related projects and policies to demonstrate the economic benefits such as improved energy security and reduced emissions.

6. Spatial Planning and Climate Change Mitigation

Globally, the advocates of climate change mitigation have noted spatial planning as a comprehensive tool which contributes towards reducing GHGs emissions (Busayo *et al*., 2019). In urban areas, climate change mitigation and spatial planning are intricately interlocked as the latter plays a key role in safeguarding the environment (Meerow & Newell, 2017). Oliveira & Hersperger (2019) stated that in spatial planning practice, the main opportunities for reducing GHGs emissions are through designing energy-efficient buildings and promoting integrated transport planning. In addition, it involves saving energy through the conducive location of new commercial and residential developments and producing energy using renewable resources (Wendea *et al*., 2010). In practice, most local municipalities are still relying on electricity generated from burning fossil fuel, high energy consumption and traffic congestion which continue to increase the amount of atmospheric emissions. Despite the potentiality that the spatial plans have in the quest to mitigating climate change, majority of these plans face difficulty during implementation. The inability of municipal spatial plans to be effectively implemented can be

attributed to the challenges such budgetary constraints, political will, administrative capacity and human resources.

However, the effectiveness of spatial planning in mitigating climate change is dependent on the ability of officials to ensure alignment and co-ordination of policies and plans from diverse sectors such as transport, housing, energy and waste management and mining (Wang *et al*., 2018), and thus, addressing climate change from a holistic perspective. Despite the continuous effort by spatial planners to ensure alignment of policies and control harmful gasses from transport industry, cities are still experiencing difficulties to contain emissions (Oliveira & Hersperger, 2019). This increase in GHGs emissions can be attributed to the increasing traffic congestion, methane emission from waste and manufacturing industry. For instance, in Iran, spatial planning officials in Tehran city found it difficult to implement emissions reduction strategies because the total number of vehicle ownership had an annual growth rate of 4,9% between 2002 and 2010 and it is expected to escalate till 2030 (Shoorcheh, Varesi, Mohammadi, Litman, 2016; Shaygan, Mamdoohi & Masoumi, 2017). In South Africa, various municipalities have implemented integrated transport systems such as the use of Buses, BRT, Uber, taxify or Bolt and minibuses to reduce the heavy reliance on private cars which increase congestion and GHGs emissions. Despite these efforts to reduce traffic congestion which contribute heavily towards climate change, cities such as Johannesburg, Pretoria, Durban and Cape Town continue to experience high congestion during peak hours.

The critics of high residential density development argue that the spatial organisation of human settlements should be structured in a manner that will ease accessibility of public basic services such as water and electricity (Hersperger, Gradinaru, Oliveira & Gaetan, 2019). The argument was that human settlements should be climate resilient to avoid devoting resources for their rehabilitation post any perturbation thereof (Hersperger *et al*., 2019). However, Reckien *et al.* (2018) also argued that many sustainable cities prioritise climate change mitigation over adaptation because of the benefits of mitigation such as improved energy security, economic savings and reduced emissions. These benefits have also motivated some countries and corporations to focus their responses to climate change mitigation initiatives, as most measures have been channelled towards reducing GHGs emissions (Daddi, Bleischwitz, Todaro, Gusmerotti & De Giacomo, 2020).

In South Africa, the Department of Environmental Affairs (DEA) has promulgated National Climate Change Response White Paper in 2012 (NCCRWP) to ensure that emitting economic sectors formulate lower-carbon development and mitigation strategies (Rennkamp, 2019). The strategies formulated should indicate a suite of mitigation measures and programmes appropriate to each sector. Spatial planners should therefore make sure that strategies to mitigate climate change in each sector are verifiable and measurable to monitor their outcomes (Rennkamp, 2019; Daddi *et al*., 2020). The strategies will further be monitored and measured against the national GHGs emissions trajectory which is to contain anthropogenic climate change to well below a maximum of 2°C above pre-industrial levels (DEA, 2012). However, many of the municipal plans are not aligned with NCCRWP in terms of ensuring their commitment to climate change mitigation. Other plans such as IDPs and IUDF only mention climate change mitigation without the municipality providing clear strategies on how the plans will be implemented. Therefore, the spatial plans should not only be stated in rhetoric, but they should be seen to be implemented for the betterment of the city and humanity.

7. The Efficacy of Municipal Spatial Plans Implementation in an Attempt to Mitigate Climate Change

Globally, municipal spatial plans are found to be playing a pivotal role in achieving sustainable development and mitigating climate change. This is done by facilitating socio-ecological development and allocating space for various activities. It is important to note that industrial, residential and transportation facilities are amongst the main sources of GHGs emissions in urban areas (Daddi *et al*., 2020). Therefore, the effective implementation of municipal spatial plans such as settlements upgrading, social and economic inclusion, environmental protection and local integrated transport plans is integral in addressing climate change. The spatial organisation of integrated transport plans can, if implemented effectively, reduce emissions in urban areas by reducing private car use (Shoorcheh *et al*., 2016). Therefore, to ensure the effective implementation of spatial plans, there must be

consultation with all stakeholders, political will from all three spheres of government and budget directed for ensuring climate change mitigation. The implementation of municipal spatial plans encourages sustainable transportation such as the use of electric cars, public transports, walking and cycling as emissions will ultimately be reduced (Wang *et al*., 2018). In countries such as Finland, Germany and Netherlands, the spatial planning allowed for walking, bicycles, electric cars and bikes in accessing the city (Hiselius & Svensson, 2017) in order to reduce GHGs emissions. Therefore, it is clear that integrated transport planning in urban areas plays a significant role towards climate change mitigation. However, in many Africa cities like those in South Africa which are based on an apartheid or colonial approach to planning has made it difficult to fully integrate transport systems within the cities due to small streets and spatial alignment. The use of E-bikes and cars contributes towards mitigating climate change as it represents an efficient carbon dioxide reduction strategy (Hiselius & Svensson, 2017). However, the socio-economic status of South Africa cannot adopt some of the strategies employed in other developed countries, thus contextualisation is profound to make meaning of the plan in South African cities. That means to address climate change, the economic and social inclusion plans, along with settlement upgrading plan should be implemented effectively to improve people's living conditions and sense of wellbeing. Urban settlements upgrading plans contribute to climate change mitigation by making living areas more energy efficient (Wang *et al*., 2018). In its inception, SPLUMA recognised South African municipalities as key avenues to act towards addressing environmental problems including climate change. Focusing on the development principles of the act, spatial resilience and justice are applied to ensure efficiency in implementing municipal settlements upgrading plans (Botai, Botai & Adeola, 2018). As mentioned earlier, most countries are sceptical to promulgate robust climate change policy as it may result into weak economic and developmental growth. However, spatial plans through collaborative and coordinated plans should be implemented in such a way as to reduce emissions while maintaining economic growth. In South Africa, electricity is generated from burning fossil fuel which is the highest contributor to GHGs emissions. Therefore, solar systems should be installed for all municipal buildings for lighting and street lights to reduce the amount of electricity consumption in South Africa. The citizens can thus be encouraged to use solar system and gas within the households. The reduction of electricity consumption and reduced traffic congestion through integrated transport system help cities to reduce emissions in an attempt to mitigate climate change.

8. Conclusion and Recommendations

A lack of political will from all the three spheres of government, fragmented funding mechanisms and the Apartheid spatial arrangement of cities have challenged many urban South African municipalities which embarked on the process of mitigating climate change. The challenge can also be attributed to administrative incapacity and heavy reliance on fossil fuels to generate energy that make GHGs emissions to bloom. The theory of resilience has demonstrated that for spatial plans to effectively address climate change, they must have an ability to operate even in the presence of any change on the environment. In pursuit of climate change mitigation, the resilience theory can further be attributed to ability of spatial plans to remain operational even in the advent of efficient energy generation mechanisms. Furthermore, there should be provision of funding to effectively implement spatial plans and for urban renewal programmes to be resilient and feasible. Additionally, urban municipalities should devote adequate financial and human resources to deal predominantly with climate change and avoid incorporating it within the broad environmental management. To address climate change in South Africa, there is a need to shift from generating electricity from fossil fuels to using renewable energy. There is also a need to restructure SPLUMA and ensure that at least a new chapter or objective which talks explicitly to climate change is entrenched within the Act.

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