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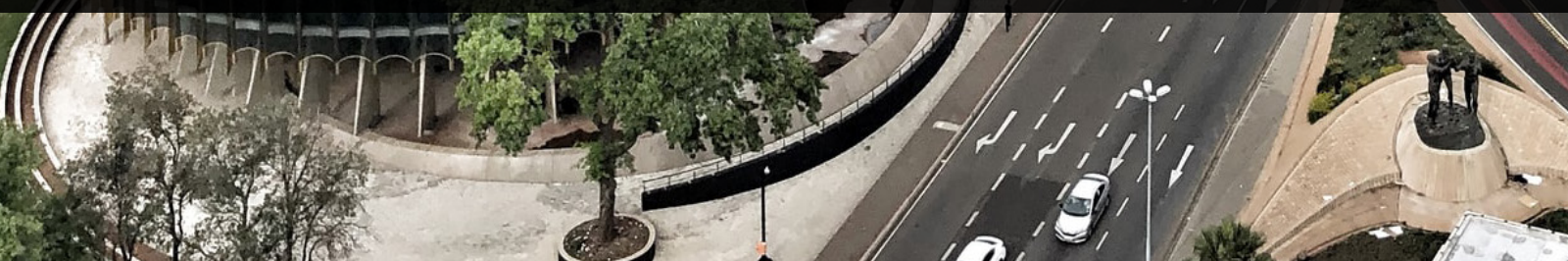
Population and Public Management in South African Cities



CONTENT

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South Africa, as developing country is still in an urbanization stage with less than 65 per cent being urbanized. This puts significant strain on the existing management and future planning of towns and cities, who according to the country's constitution, is responsible for all housing and land use matters. Although local- and metropolitan municipalities are responsible for the aforementioned, they are also legally obliged to integrate principles of *public participation, sustainability* and *urban integration* in spatial planning matters. Regarding these, we will be focusing on the population and public management in South African cities in this issue of IGLUS Quarterly. As a collaborative work of IGLUS and the Urban and Regional Planning Department of North-West University, four articles from the experts of their field will be covered in this issue.

The following articles reflect on the interpretation of these themes, applied on local, metropolitan and national levels. At a stage where a national development plan has been drafted for the first time in many decades, these innovative approaches could appositely be applied as principles and guidelines in the finalization stages of the existing *draft* National Spatial Development Framework (2021).

In the first article, Gert Carel Basson and André De Wet Brand discusses the ageing populations in South African metropolitan regions and subsquent planning implications. The article focuses on the changing elder population distribution in South African metropolitans. It further draws attention to the planning and management related issues of ageing population by also signifying how a focus on insights should encourage policymakers and researchers to confront the multiple ways of being distinguished as 'old' or 'elder'. We believe this article will shed light on the future researches bringing solutions to the cities with population aging.

In the second article, Lindelwa Sinxadi and Maléne Campbell focus on the sustainable neighborhood performance and the influence of community participation by planners on it by giving illustrations from Mangaung Metropolitan Area. After giving a literature review on community participation in an urban planning context, community participation strategies and sustainable neighbourhood performance – encumbrances for the optimal level of community participation, the authors talk about the challenge of community participation during the planning and implementation of planning projects. They also explores the influence of planners on community participation with other urban stakeholders for planning projects.

The third article is from the City of Cape Town. In the article, Danette de Klerk first talks about the recent history of record management in the Development Management Department of the City of Cape Town. Then, she continues by introducing the Development Application Management System (DAMS) and illustrates how the very timeous shift to online-only submission and management of applications through the DAMS enabled continued processing of applications by also touching upon on the City's initiatives to stimulate economic growth and create local employment opportunities in the wake of the COVID-19 pandemic.

Last but not least, in the fourth article, Kevin Parry presents the residential racial segregation across South African metropolitan areas. He applies Theil's entropy index to measure segregation across South Africa's eight metropolitan cities, using data from Census 1996, 2001 and 2011, and analyses the current level of segregation in South African cities by comparing them with the cities of United States. We believe his discussions will provide insight into the segregation patterns of many other cities in the world.

We sincerely hope that you can enjoy this issue of IGLUS Quarterly. We invite you to join the discussion at iglus.org. If you feel there are innovative practices underway in your city/region and you would like to contribute to an upcoming edition of IGLUS Quarterly, we encourage you to contact us at umut.tuncer@iglus.org. You may also contact the editors of this issue through Ernst.Drewes@nwu.ac.za and numanyanar@hotmail.com.

Editors of this issue: J. Ernst Drewes and Numan Yanar

Ageing Populations in South African Metropolitan Regions and Subsquent Planning Implications

Gert Carel Basson*, André De Wet Brand**

Abstract: *Population aging is one of the major forces shaping the 21st century. The share of older people is globally on the increase and it is estimated that by 2050 almost 80 percent of all the older persons in the world will be living in developing regions. This paper provide clear evidence of the South African case: that the 65 years and older cohorts are on the increase. The paper also draws attention to the fact that issues of planning related to such a demographic transition is currently not properly addressed. Catering for a demographic transition of this nature, is currently not properly addressed as it related to both older people's possible contributions as well as their needs and rights.*

Keywords: *South Africa, ageing, metropolitan regions, planning implications, age-friendly cities*

Authors' Profile

Gert Carel Basson is a Deputy Director at Statistics South Africa. His research interest lie in the area of urban and regional planning, specializing in ageing and development.

André De Wet Brand is a Director at Statistics South Africa. His research interest lie in the area of urban and regional planning, specializing in regional development.

Introduction

Population ageing and urbanization are major forces shaping the 21st century. Several factors shape the lifelong process of ageing. These factors, standing alone or working together can favor health, paticipation and security in older adult life. Cities experience an increase in their share of the population aged 65 years and older. The United Nations [UN] (2017) estimates that by 2050 almost 80 per cent of all the older persons in the world will be living in developing regions. A demographic transition of this nature makes it imperative that urgent attention be given to future planning (United Nations Habitat, 2008). Conceptualisation and planning for this eventuality should start in good time, while researchers, policy makers and practitioners still have a window of opportunity. To this end, and with the South African metropolitan regions as case in point, this paper sets out broadly to investigate the urban futures of the South African metropolitan population, with a specific focus on its older cohort. The aim of the paper is to analyse the increasing in the numbers of older people in each of the eight metropolitan regions to establish current trends. The paper then sets out to establish if national planning frameworks coinside with such a demographic transistion and what their subsequent planning involvement reveal.

Ageing Population Dynamics

The demand for different types of facilities and services is closely related to age demarcation. For example, a city with a population with a high percentage of residents under the age of 15 would require schools, primary health services, and recreation facilities. Moreover, an

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increasing number of older populations imply a need for access to facilities such as relevant long term care systems related to a continuum of support to older people, their families and communities and other services i.e. in the South African case, easy accessible pension or grant pay points (WHO, 2007).

A study overseen by the UN (2017) found that around one million people reach the age of 60 worldwide every month. Of these, 80 per cent live in developing countries. Similarly, Africa's populations are following the trend of ageing and according to a report produced by the African Development Bank Group [AFDB] (2011) it seems that governments are ill-prepared to manage the growing number of older people (also see planning implications). For Africa, people aged 65 years and older has increased from 3.3 percent in 2000 to 3.6 percent (n=36 million) in 2010. The report also stated that by 2030 the figure could increase to 4.5 percent (n=46 million) and in the region of 10 percent (n=166 million) by 2050.

As elsewhere, the ageing of the population in South Africa is influenced by three key drivers, namely lower fertility, reduced mortality and migration patterns. According to Statistics South Africa [Stats SA] (2019) fertility has declined from an average of n=2.62 children in 2009 to n=2.33 children in 2020. Although the fertility rate increased somewhat for younger women, a general reduction in the fertility rate is apparent when the data for all women are analyzed. Analyzing the mortality and causes of death for South Africa it is evident that, overall, the age pattern of mortality was uniform with consistent declines in mortality proportions from age group 20 to 24 up to age group 50 to 54, and from age group 55 to 59 up to 90 years and above (Stats SA, 2020b). Besides births and deaths, in- and out-migration also have an effect on the demographics of a region. The age group with the highest number of migrants into South Africa is 20 to 44. This age group represent 64.8 per cent (n=1022993) of all immigrants (n=1578541) or 4.6 per cent of the total population (Stats SA, 2020b). What makes the age group 20 to 44 in general so significant is the notion that by 2050 this potentially large workforce will be entering or be about to enter retirement age.

A Community Survey (CS) conducted during 2016 revealed that around 5.3 percent (n=2.9 million) of the total South African population were aged 65 years and older (Stats SA, 2016). The 2019 mid-year population estimates, increased the size of this age group to an estimated 6 percent (n=3.6 million), an upward trend in the expanding size of this cohort, is expected to continue. According to Stats SA the percentage of the population 65 years and older will increase from around 6.1 percent (n=3.64 million) in 2020, to 6.61 percent (n=4.15 million) in 2024. This, as estimated by the UN (2017), should double to 15.9 percent by 2050.

Besides ageing, South Africa is also experiencing rapid urbanization. According to the Parliamentary Monitoring Group [PMG] (2020c), the 67 percent of citizens already living in urban areas is estimated to increase to 71 percent by 2030 and 80 percent by 2050. Urbanization will not only increase the demand on infrastructure requirements but will also institute challenges on how the urban environment may influence the health and quality of life of an older population (Beard & Petitot, 2010).

Age-friendly Cities

There is a growing international awareness that location and place, which in essence refer to regions or cities, are important elements for growth and development. This growing international awareness has had an important influence on various development approaches promoted by organizations such as the UN, the Organization for Economic Co-operation and Development (OECD), the European Commission (EC) and the World Bank (WB), where extensive rethinking followed, which promoted the benefits of urbanisation as a result of the advantages cities offer for economic and social inclusion (Brand & Drewes, 2020).

Age-friendly cities encourage active ageing by optimizing opportunities for health, participation and security in order to enhance quality of life. An age-friendly city adapts its structures and services to be accessible and inclusive to an older population with varying needs

(WHO, 2007).

An age-friendly city is not planned for an older population alone; it is designed to cater for all ages and for the future demographic changes in populations. It should be remembered that today's youth bulge is tomorrow's age bulge. Although internationally much research has been conducted on age-friendly cities, very little has been done in Africa and indeed South Africa. Lui et al. (2009) grouped the characteristics associated with age-friendly communities into physical- and social factors. Physical factors incorporate the built environment, housing, and public transport which maximizes mobility and independence. Social factors on the other hand constitute employment, community planning, involvement in activities, communication and information which promotes social and civic engagement.

Over the last decade several useful guides have been developed to assist communities to become age-friendly or to determine their age-friendliness. It is important to understand that population dynamics and composition as well as physical and social environments vary from country to country and city to city. However, the generic principles for formulating the necessary policies and strategies for an age-friendly environment are fundamentally the same because the needs and requirements are mostly uniform for each age group. The principles which are interrelated consist of housing, civic participation and employment, community support and health services, and outdoor spaces and buildings (WHO, 2007). Transportation, social participation and respect and social inclusion can also be added to the list. These principles according to the WHO (2007) will make cities increasingly age-friendly which is a required and rational response when promoting the welfare and involvement of older urban residents. Bernard *et al.* (2001) asserted that policy formulation should analyse particular strategic barriers to engage older people in the (re)development of their communities. These particular barriers are an expression of the above mentioned principles and should consider the different groups within the older population and take into account the various requirements of different ethnic groups and those with particular needs.

Metropolitan Regions in South Africa

Research interest in South African cities has steadily been growing (Marais and Nel, 2019). The interest was triggered by a growing awareness in the governance of metropolitan regions. Political pressure urged the government of South Africa into expanding the number of metropolitan regions. The eight cities governed by metropolitan regions (Figure 1) and considered South Africa's *primary cities* are City of Tshwane (Pretoria), City of Johannesburg, Ekurhuleni, Mangaung (Bloemfontein), eThekwini (Durban), Buffalo City (East London), Nelson Mandela Bay (Port Elizabeth) and City of Cape Town.

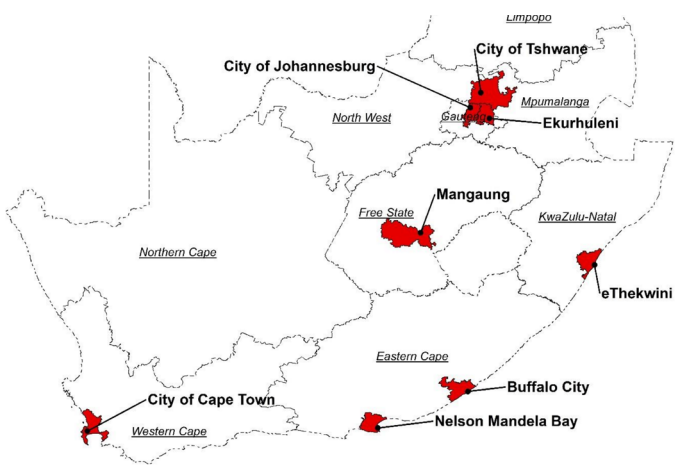

Figure 1. South African metropolitan regions
Source: Author's own resources

Life expectancy is a prominent observable and measurable characteristic that can be employed to signal, or point out recent trends in age demarcation. However, life expectancy is produced at a provincial level only. Hence to establish recent trends for the older populations at a metropolitan level, longevity (long life) as an indicator was applied.

Figure 2 provides a breakdown of the ageing cohort (65+) in relation to the total population per metropolitan region. Evident is that each metropolitan region reveals a noticeable increase punctuated with a sharp increase

between 2011 and 2016. The Ekurhuleni metropolitan region has the most distinguishable increase enlarging from 3.58 percent in 2001 to 9.12 percent in 2016. Figure 3 provides a comparison of the 65+ cohort in the metros as a percentage per province of the total South African population. The same age cohort per province in relation to the total population of the country increased from 1.58 percent in 2001 to 3.50 per cent in 2016. The Gauteng province has the most distinguishable increase. The analyses corroborate favorably with the estimations predicted under the section ageing population dynamics. From Figures 2 and 3 it can also be deducted that not only is the number of the 65+ cohort increasing, they also tend to become more urbanized. One can surmise that such an occurrence may implicate the quality of life for the 65+ cohort.

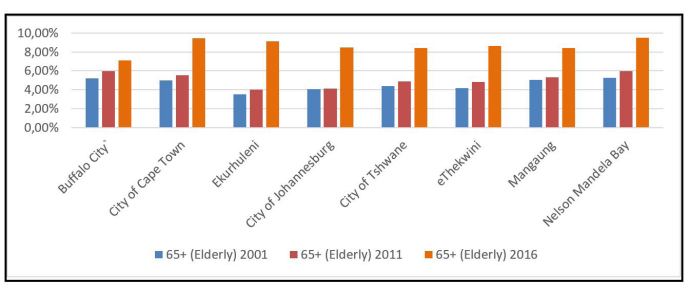

Figure 2. Older population (65+) of the South African metropolitan regions between 2001 and 2016
Source: Stats SA 2001, 2011 & 2016

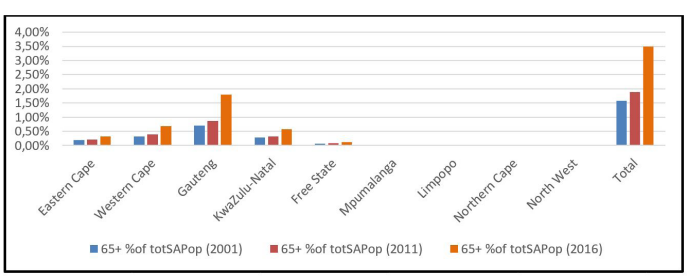

Figure 3. Older population (65+) of the South African metropolitan regions per province between 2001 and 2016
Source: Stats SA 2001, 2011 & 2016

Planning Implications

South Africa adopted a National Development Plan [NDP] (2013) referred to as a *'super plan'* to transform economic and social inclusion. As an outflow from the NDP, South Africa also adopted Spatial Development Frameworks (SDFs) ranging from national to local. SDF's are the collective vision of government, businesses, and civil society to promote economic and social inclusion. One of the National Spatial Development Frameworks [NSDF] (2021b) shapers depict Demographic Shifts, Dividends, Vulnerabilities and Diversity. Although the shaper underlines the share of the population that will be '65 years of age and older' and acknowledge that this particular age group will require more health and frail care and income support from households, communities and the State, the framework doesn't portray any particular programmes, policies or planning initiatives that will promote social and economic inclusion of older people. Besides the NSDF (2021b) each of the eight metropolitan regions respective Spatial Development Frameworks (SDF) also acknowledges the increase in the 65 year and older cohort. However, the metropolitan regions approaches of catering for this cohort vary substantially. Buffalo City mainly focuses on enabling safe access to transport systems as well as a health system that provides quality healthcare. The City of Tshwane states that the elderly should be able to move around safely to allow them to access places and facilities. Mangaung identifies care and assisting the elderly with social grants as a key way forward. Although the City of Cape Town identifies potential problems to cater for the elderly, they only acknowledge public and open spaces to be well-located and accessible to the elderly. The City of Johannesburg, Ekurhuleni (most notable increase from 3.58 per cent in 2001 to 9.12 per cent in 2016) and Nelson Mandela haven't provided any particular plans or initiatives to cater for the elderly. EThekwini is the only metropolitan region that under their security section not only acknowledges the special needs of the 65 year and above cohort, but turn out to be more innovative. EThekwini adopted a vulnerable group's policy initiative which aims to create a framework for social and economic integra-

tion. Specific initiatives incudes safe homes, affordable, accessible and sustainable transport systems, and universal access to safe, inclusive public spaces (South Africa, 2015a, South Africa, 2015b, South Africa, 2016, South Africa, 2018, South Africa, 2020a, South Africa, 2020b, South Africa, 2021a, South Africa, 2021c).

It is evident that planning to accommodate the gradual rise in the number of elderly people is important for the sustainability of cities. Urban planning plays a vital role in this regard. Scholars such as McNeill (1983) and Oranje (2021) proclaim that the role of urban planning has nonetheless changed over time. Oranje (2021) professed that urban planning in the South African context became a legally mandated, regulated and/or sanctioned, standardized public sector function i.e. regarded as the sole preserve of progressive politicians. Purcell (2003) argued that *"the right to the city"* requires two basic principles namely, complete usage of the city, and being able to participate in decision-making regarding the production of urban space. Purcell's argument touches on Goal 11 of the Sustainable Development Goals [SDG] (2015) which read out *'Make cities and human settlements inclusive, safe, resilient, and sustainable'*. One can reason that the goal calls for more inclusive and innovative approaches to promote the sustainability of cities i.e. age-friendly cities. In addition, it aims to promote all-inclusive access to safe and affordable housing, public spaces, and transport systems, especially for older people and those with disabilities. For South Africa, planning systems such as SDF's do favor a more direct stakeholder consultation process. In Litman's (2020) view, such systems takes into account distinct perspectives, allowing decision makers to find best solutions to uncertain issues, as well as productive ways to respond to those issues. However, the implementation of such systems faces multiple challenges such as inadequate community participation, shortage of resources, political meddling and limited capacity. Planning frameworks drawn from a national to local level lack the betterment of making South African cities more age-friendly. Given the lack in advocating innovative initiatives it is safe to assume that the needs of the elderly population are not properly addressed. Therefore, is there an innovative course of action that can accommodate the complexity of older people? The African Union [AU] (2021) in their draft policy framework and plan of action on ageing propose that it is critical that the perspectives of older persons are centered in the design, planning, implementation and monitoring of policy or programmed conception, development, implementation, monitoring, evaluation, learning and reporting. One can argue that eThekwini's vulnerable group's policy can be perceived as an innovative course of action which in retrospect can be associated with the AU plan of action to cater for the elderly.

Conclusion

This paper signifies how a focus on insights should encourage policymakers and researchers to confront the multiple ways of being distinguished as 'old' or 'elder'. As seen, although a multiple of planning frameworks exists and are in good standing, such frameworks tend to ignore the intrigues of the elderly and their participation in decision-making processes. Older people not only shape but are shaped by urban dynamics. Accordingly, we argue for situated and comparative approaches that analyze how people discover ways to improve their life choices as they become older. Furthermore, although Africa as a continent will be young for the foreseeable future, it is clear that the number of older people is staggering. Although the paper focused on the metropolitan regions, in this way, South Africa can better attune ageing to how the elderly navigate not only the social but also the physical environment including expectations, identity, and (inter)dependencies. The paper also points to a necessity to better conceptualize elder people's current exclusion from urban governance i.e. adopting a type of vulnerable group's policy framework or action plan.

We recognize that there are limitations to the study. Longevity conform with the census and community surveys with the last census and community survey conducted in 2011 and 2016 meaning we could only exploit data from the 2001 and 2011 censuses and 2016 community survey. Notwithstanding potential limitations,

the analyses show that an age transition of this nature accentuates the notion that the economic and social inclusion of an ageing population is becoming increasingly apparent. Planners and policymakers will be confronted with several interrelated issues such as increased access to health care, infrastructure, unsupportable pension commitments and progressive changes within the economy. These issues could significantly compromise the living standard enjoyed in modern economies.

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Exploring the Influence of Community Participation by Planners on Sustainable Neighbourhood Performance: The Case of Mangaung Metropolitan Area

*Lindelwa Sinxadi, **Maléne Campbell

Abstract: *The South African government supports the sustainable neighbourhood concept. This commitment occurs mostly at local government levels where planners must champion this aspiration and bring it to fruition. However, there is still an increase in urban Public Open Space (POS) encroachment by informal human settlements in South Africa. This shows a lack of performance from planners and other stakeholders in this regard. This study adopted a qualitative case study research design to elicit the views of planners and other practitioners on their involvement in community participation when planning, designing and managing urban public open spaces. The study's findings confirm that planners have a significant influence on community participation when planning, designing and managing urban public open spaces. For effective management of urban public open spaces, the identification of encumbrances to reach an optimal level of community participation in the planning processes should be prioritised.*

Keywords: *community participation, sustainable neighbourhoods, urban public open spaces*

Authors' Profile

Dr Lindelwa Sinxadi is currently the Chief Town Planner for the Department of Education of the Free State Province. While she was a lecturer at the Central University of Technology, she also lectured part time in the department of Urban and Regional Planning of the University of the Free State where she was also a moderator for our Honours and Masters programme modules. In addition, Dr Sinxadi successfully supervised a master's mini-dissertation. Her publications focussed on the barriers in planning and management of urban public open spaces.

Associate-Professor Maléne Campbell is a professional Town and Regional Planner with 34 years experience. She worked both in private and public sector and has been teaching at the University of the Free State for the past 25 years while doing research. She delivered four PhD, one research master's and 72 Masters mini-dissertations students during her academic career. Editorial contributions include the role as member of the editorial team of the Town and Regional Planning Journal as well as for the journal Acta Structilia. She is currently the Academic Departmental Head of the Department of Urban and Regional Planning.

Introduction

Community participation is at the core of planning and involves various urban stakeholders in the decision-making process. It promotes democracy, justice and sustainability (Alexander, 2008). The South African Government has reiterated its commitment to the advancement of the sustainable neighbourhood concept. Planners have a role to play in creating sustainable neighbourhoods, but they have been challenged by the gradual disappearance of urban public open spaces in favour of residential purposes. This is an indication of the underwhelming planning performance on the part of planners as well as other urban stakeholders involved in planning projects. Therefore, the level of community participation and its influence on different stakeholders plays an integral part in achieving sustainable neighbourhoods. Mahjabeen, Shrestha & Dee (2009) view community participation as a significant element in achieving sustainable development. Rowe & Frewer (2000) allude that community participation involves various procedures including consultation, community involvement and the rendering of information to the community. Community participation is the direct involvement of the community members in planning, governance and development issues at the grassroots level (Mafukidze & Hoosen, 2009). Where correct procedures

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for community participation are not followed, challenges such as the illegal occupation of land emerge. Therefore, the consequence of such challenges is value conflicts in terms of the quest for a sustainable neighbourhood (Sinxadi & Campbell, 2020).

Participation and collaboration are crucial in planning, and various policies are put in place to this end. The Guide on participation in the public service (RSA Department of Public Service and Administration, 2014) reiterates opportunities and drivers for community participation, which are beneficial to all citizens. Correct strategies taken during community participation enhance the quality and legitimacy of decisions taken by the various stakeholders in the planning processes. There is a need for a paradigm shift on the procedures used in community participation, especially at a local level. The UN-Habitat (2015) and Krishnaveni & Sujatha (2013) indicate the need for the capacitation of urban stakeholders in the planning processes. This can be achieved by means of an effective application of resources as well as management of development programmes.

To achieve its objective the paper commences with a review of the literature on the following aspects: community participation in an urban planning context, community participation strategies and sustainable neighbourhood performance – encumbrances for the optimal level of community participation. This is followed by the justification for the chosen research methodology, the presentation and discussion of the findings and finally the conclusion.

Community Participation and Sustainable Neighbourhood Performance

Community Participation in an urban planning context

Planning theory is increasingly emphasising participation and collaboration (Watson, 2003). When collaborative governance was spreading through the British Isles, other forms of alliances and participation took off abroad (Healy, 2006). Planning and policies should be based on interactive social processes because urban planning is about the future city and how it impacts its residents (Hillier & Gunder, 2003). At a time when planning was influenced by neoliberal tendencies (Healy, 2003), it was noted that urban challenges will not be resolved by the market or by communities (Watson, 2009). Therefore, in policymaking, and in the execution of it, planners have to negotiate and reach compromises (Healy, 2006). Planners have to know who the local stakeholders and role players are. They have to comprehend and acknowledge the underlying forces as well as the background of a neighbourhood.

The illegal occupancy of open spaces in urban neighbourhoods "…led to value conflicts in terms of the quest for sustainable neighbourhoods." (Sinxadi & Campbell, 2020:123). These conflicts posed challenges for planners trying to implement policies to create sustainable neighbourhoods. An increase in urbanisation placed planners under pressure to change existing zonings of 'Open Space' – in neighbourhoods – to zonings for residential uses once informal settlers had put up their makeshift housing structures on these open spaces (Sinxadi & Campbell, 2020).

Community participation strategies

Healy (1998) questioned whether governments can make and implement the necessary changes to get to places of quality. It was also the opinion of Healy (1998) that collaboration resulted in community participation and community partners in policymaking and implementation (Healy, 1998). Initially, after the Second World War, urban governance in Europe followed a top-down approach but this has since changed, and local governments are under pressure to improve the environmental quality of cities. Therefore, there should be collaboration between all stakeholders to produce a path dependency for local governance, which creates the opportunity for residents to thrive (Van Horen, 2002). Community partners have to be found and be consulted on their needs pertaining to proposed developments.

To determine the supply of, and demand for, open spaces, which are critical to the quality of life and sustainable neighbourhoods an open space index (OSI) was developed for use in the planning process (Nega, Fu & Vrtis, 2010). The OSI measures the size and distribution of

open spaces.

Sustainable neighbourhood performance – encumbrances for the optimal level of community participation

Roggema (2020:1) replied to the question of "what real sustainability knowledge is" as sustainability cannot be built on the silo approach of the past and because new parameters must be developed. An integrated approach should be followed, and it must be possible for proposals to be tested virtually.

The second Habitat Agenda (UN, 1996) lays emphasis on the development of sustainable human settlements. The planning and development of settlements should be done in such a manner that the upgrading and improvement thereof are based upon, and takes full cognisance of, the sustainable development principles. The United Nations Habitat (UN, 2009) proposed that the community must play a role and be consulted about planning processes. This was repeated in the 2016 Habitat III Zero Version document, which emphasised the provision of human settlements in a sustainable manner.

In South Africa in 2004, the Draft National Urban Strategy (South Africa, 2004) proposed that urban areas in South Africa should be urbanised based upon environmentally acceptable principles. The purpose of such a strategy for the government would be to reach a revitalised agreement with communities and partner organisations to develop more sustainable human settlements. According to the South African Spatial Planning and Land Use Management Act (RSA 2013:18 section 7b), one of the development principles for spatial planning and land use management is spatial sustainability. In addition, it is expected of local government to create a statutory land-use scheme (RSA 2013:23 section 23).

Mitigation strategies for effective community participation

Friedmann (2011) states that theoretical perspectives are developed according to certain eras or periods. During the previous four decades, we saw a move from post-positivistic theories towards power (Allmendinger, 2009). Relativists acknowledge that planning theories have merit because their foundation is related to the values of the community who holds them. Friedman (2011) sees post-modernism as the increase of big multi-national corporations – or the market getting bigger – while the government, and its sphere of influence, is getting smaller.

To govern successfully, national governments need to capacitate themselves to be more capable of providing the needed support to their nations (Krishnaveni & Sujatha, 2013). To have capacity refers to the continuous ability to efficiently accomplish what is required of the organisation. This should be done while applying resources in an efficient and effective manner to successfully implement and manage development programmes while also generating a supporting environment. A case study of western Sweden showed that to develop sustainably within pro-market policies, partnerships and networks must be formed (Polk, 2011). Polk (2011) continued to explain how the public and private sectors can collaborate under the umbrella of collaborative planning.

In South Africa, there were requests for Public-Public Partnerships (PUPs) to replace Public-Private Partnerships (PPPs) (Van Rooyen & Hall, 2007). The identified contributing factors of successful PPPs are, amongst others, a strong private consortium, political and public support as well as transparent procurement (Osei-Kyei & Chan, 2015). To improve public services in the absence of these contributing factors in South Africa there was a request to abolish private sector involvement because it was assumed that PUPs will manage public water facilities more sustainably. Such an agreement could guarantee that especially lower-income families have improved access to water (Van Rooyen & Hall, 2007).

Community participation in Mangaung township

According to the Mangaung Metropolitan Municipality's (according to the South African Local Government: Municipal Structures Act [117 of 1998] a Metropolitan Municipality has exclusive executive and legislative authority) Integrated Development Plan (according to the South African Local Government Transition Act 209 of 1993 an integrated development plan integrates development and management and requires public participation)

the Municipality – in the Free State Province, South Africa – comprises three prominent urban centres, which are surrounded by an extensive rural area (IDP 2017/18). These include Bloemfontein, Botshabelo, Thaba Nchu, Soutpan, Dewetsdorp, Wepener and Vanstadensrus. The Mangaung townships are faced with a gradual disappearance of urban public open spaces due to the encroachment of housing structures. Urban public open spaces are encroached upon due to rapid urbanisation, poor enforcement of land-use regulations, poor management and low prioritisation of urban public open spaces (Sinxadi & Campbell, 2020). To curb the incidence of urban open space encroachment, effective planning is necessary. The involvement of various urban stakeholders within the municipality and community participation serves as a solution to encroachment. Mangaung is experiencing low levels of representation for community participation in planning processes. The following open spaces were selected as case studies for this study (erven 37321, 35180 and 36502, Mangaung) because these erven best represent the challenges of urban public open space encroachment in the area. These spaces are currently subdivided and zoned for housing purposes. Figure 1 below illustrates the urban public open spaces encroached upon for residential purposes.

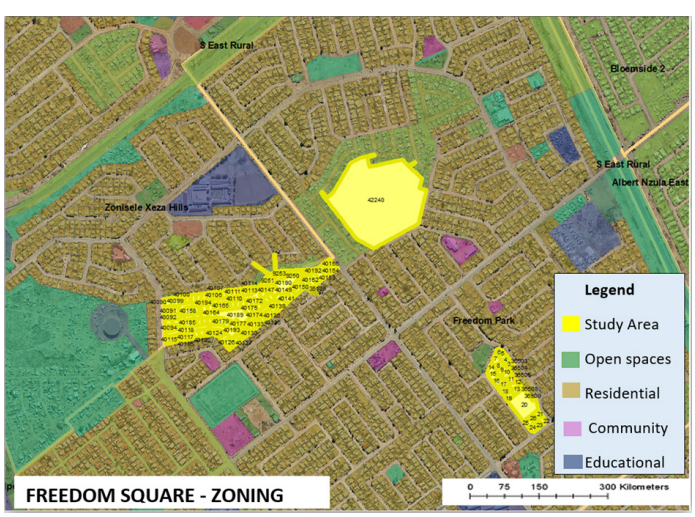

Figure 1. Urban public open spaces encroached for residential purposes
Source: MMM GIS 2019

Research Methodology

The study sought to explore the influence of Community Participation (CP) by planners on sustainable neighbourhood performance in the MMM. Techniques, such as semi-structured interviews, document reviews and personal observation were employed for data elicitation.

A qualitative case study research design was employed for this study. Creswell and Poth (2018) allude that the case study research design allows the researcher to explore a contemporary bounded system through detailed, in-depth and contextual data collection. Also, the choice of the case study research design grants the researcher an opportunity to deploy a plethora of tools for data collection and analysis within the bounded system (Yin, 2011). For the selected study areas, the researchers of this study employed techniques such as semi-structured interviews, focus group interviews, personal observations and document reviews to collect data. Data was collected from the purposively selected stakeholders, such as planners, human settlement representatives and environmentalists within the MMM and focus group discussants who formed part of the community representatives residing in the three case study areas (erven 37321, 35180 and 36502, Mangaung) as well as residents in close proximity to these case study areas. The selected case study areas were chosen to explore the comparison amongst the three urban public open spaces in Mangaung. The aim of the study was to explore the influence of community participation in planning and management of such spaces. Furthermore, the use of purposive sampling allowed the researchers to rely on their experience when selecting the sample, due to familiarity with the study area and the interviewees (Wagner, Bourne & Rowlinson, 2012). Semi-structured interviews conducted with the planners allowed flexibility to the researchers in order to explore the complexity of the research problem from the perspective of the research participants. In this case, open-ended questions were used for data collection (Merriam & Tisdell, 2016). Regarding focus group discussions, a protocol was designed, and the focus was placed on the participants' perceptions about community participation in planning and managing urban public open spaces. Ward councillors were used as

"gate-keepers" in all three cases and the discussions were held at a local school.

The selected participants for both the semi-structured interviews and the focus group discussion session comprised town planning professionals, human settlement representatives, parks and cemeteries professionals, ward councillors, residents of Freedom Square – who occupied the selected urban public open spaces – as well as those residing near the encroached-upon spaces. The three case study areas are categorised as urban public open spaces 1 (erf 37321), 2 (erf 35180) and 3 (erf 36502) – UPOS 1,2,3. Tables 1 and 2 below give an overview of the participants involved in the study.

Table 1. Semi-Structured Interviews Demographics
Source: Author's fieldwork ;2019

Planning Professionals	Code	Cases
Town planning	TP1, 2, 3, 4	UPOS1,2,3
Human Settlements	HS1, 2, 3, 4	UPOS1,2,3
Parks and Cemeteries	H1, 2	UPOS1,2,3
Total	10	

Table 2. Focus-Group Discussants Demographics
Source: Author's fieldwork ;2019

Focus group	Code	Cases
Ward Councilors	WC1-2	UPOS1,2,3
Community Members	CM1-8	UPOS1,2,3
Total	10	

The Municipal Manager gave written consent to allow the researchers to interview the officials forming part of the projects done on municipal land. Interviews were scheduled for an average of 40 minutes at their offices. Questions posed to the participants included their involvement in community participation in planning and management of the UPOS. The emerging data from both the semi-structured interviews and focus group discussions were analysed thematically.

Presentation and Discussion of Findings

Collaboration and communication among urban stakeholders involved in planning projects

Innes & Booher (2004) allude that community participation assists decision-makers in getting information regarding the preferences of the community members so that they can also participate in the decision-making process. It further assists in improving decisions made, and this is achieved by adding inputs of the residents into the calculus.

"When planning projects are initiated, collaboration and communication are key. All the urban stakeholders involved in planning – namely planners, environmentalists, politicians and community members – have the goal of creating sustainable neighbourhoods. From the interviews, various respondents within UPOS1 and UPOS2 acknowledged that collaboration amongst the urban stakeholders is very poor. TP1 maintained that they outsource town planning projects and the consultants conduct community participation. In support of this statement, TP 2, 3 and 4 added that these consultations are done with the ward committee members to show them the intent of the development"

From the above statement, it can be concluded that the consultants who are appointed by MMM do not know the area, and this poses a challenge if community participation is not done properly. The planning of UPOS1, 2 and 3 was done by municipal officials.

From the discussions with the focus groups, it was evident that the residents were not informed about the change of land use. Based on the information stated, it can be concluded that there was lack of collaboration amongst the planners and the residents. Arnstein's ladder of participation categorise this situation under non-participation level. The voice of the community members is not a priority in planning projects. Planning profession-

als are therefore criticised because they do not consider the needs of the community members.

Planning and implementation, education and empowerment to engender community participation

Mafukidze & Hoosen (2009) allude that community members are directly involved in in planning, governance and development issues at the grassroots level. Furthermore, planners must engage with the residents before initiating planning projects, including before their implementation. Ismail & Said (2015) indicate that there should be increased co-operation amongst all the stakeholders involved in planning projects. This will assist in the achievement of effective community participation. Community members have to be educated and empowered during the community participation process and mutual trust must be built.

Findings from the three cases showed that collaboration and communication amongst the urban stakeholders. Importance of intergovernmental relations when planning is done in townships was emphasised by the participants. This has promoted the encroachment of community members on open spaces, and this leads to the gradual disappearance of these spaces. Another challenge is the disconnect amongst the municipal officials as they do not collaborate or work together on planning projects.

In addition, some residents who formed part of focus group reiterated that they were never informed of the change in land use and the subdivision of the settlement they occupy. This is aligned with a non-participatory level since the decision-making process did not involve the community members. The surrounding property owners were also not aware of the planning process for the projects. Buttressing this concern, TP1 maintained that consultation was mainly with the ward councillor and ward committee members.

Therefore, to curb this problem, community members need to be engaged by means of proper education and involvement in all planning projects. Also, all the planning professionals must collaborate and engage each other in all planning projects.

Lack of proper procedure followed for community participation regarding planning of urban open spaces

Community participation is a powerful tool used to influence decision making. During this process, proper procedures need to be followed for community participation, which will assist in capacitating the urban stakeholders (Richards, Carter & Sherlock, 2004). According to the UN-Habitat (2015), capacity building refers to the effort taken in building relations and competency in the society during the participation process. The MMM policy emphasise the use of different forms of participation. These methods include information-sharing sessions, meetings, dialogues, workshops and hearings – as and when it is required.

SPLUMA (RSA 2013) promote good administration empower the community members. Based on the nature of the community participation process followed in developing UPOS1 and UPOS2, from their experience, TP2 and TP3 added that proper procedures were not followed, and the municipality does not have proper guidelines or framework for municipal projects.

HS1, HS2 and HS3 supported TP2 and TP3 statement about lack of proper consultation with residents. HS4, WC1 and WC2 narrowed down their experience and elaborated that lack of consumer education led to some residents selling their properties. Most people who are allocated housing are not working and it leads to poor maintenance. sell their houses and return to shacks.

From the foregoing, the challenge of the gradual disappearance of open spaces was promoted by the absence of proper guidelines to engage the residence in development projects.

Conclusion

Community participation poses a challenge during the planning and implementation of planning projects. This study aimed at exploring the influence of planners on community participation with other urban stakeholders

for planning projects. Also, the study focused on three urban public open spaces (UPOS 1, 2 and 3) where two are encroached upon by residential uses in Mangaung townships. The encroachment caused loss of open spaces. The study adopted a qualitative case study approach and techniques such as semi-structured interviews, focus groups, personal observations and document review were used for data elicitation. Findings indicated that there is a low collaboration amongst the planning peofessionals and the community. The challenge faced by the metropolitan municipality is linked to the non-participatory level, as it relates to Arnstein's ladder of participation. Also, the voice of the community is silent in the planning projects because they are not consulted for decision making. It creates challenges within the municipality and all the stakeholders are in agreement with this challenge.

To solve this challenge, all the urban stakeholders need to be engaged in all the processes involved in planning projects and must engage the public in all the planning actions. Since planners have an influence in planning projects, they have to enforce compliance when there is illegal occupation of municipal land. Planners should educate urban stakeholders about all the processes undertaken in planning projects.

Findings also indicate that proper guidelines are not followed for the community participation process. The community members are only involved during the IDP process. To conclude, all the urban stakeholders must collaborate, and the proper guidelines or framework that guides the process or nature of community participation must be formulated. Planners are the key professionals to initiate community participation for all their projects.

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Development Management e-Services: An Innovative Approach in the City of Cape Town

Danette de Klerk

Abstract: *Cape Town is the second-largest city in South Africa, and is an acclaimed tourist destination. It boasts world-renowned attractions like Table Mountain, the Victoria and Alfred Waterfront, and Robben Island, the latter being a UNESCO world heritage site, where Nobel Peace Prize winner Nelson Mandela was imprisoned for 18 years prior to becoming the President of South Africa in 1994. The City of Cape Town is a large metropolitan municipality in South Africa, which came into being through the amalgamation of a number of smaller municipalities in 2000. Its Development Management Department inherited the extremely fragmented business and caseload management systems of the former municipalities, and set out to develop a comprehensive development application management system (DAMS), which is unique in South Africa. This paper aims to illustrate how the very timeous shift to online-only submission and management of applications through the DAMS enabled continued processing of applications when similar services were brought to a standstill during the early stages of the COVID-19 pandemic.*

Keywords: *Cape Town, South Africa, development management, e-services, business management systems, application management*

Author's Profile

Danette de Klerk has a Bachelor's Degree in Science (1996) and a Master in Town and Regional Planning Degree (1998) from the University of Stellenbosch, South Africa. Currently she works as Section Head of Land Use Management in the City of Cape Town's Development Management department.

Introduction

The City of Cape Town, one of eight metropolitan municipalities in South Africa (South African Government, 2021), has a proud record of being on the forefront of innovation across various disciplines insofar as local government in South Africa is concerned.

Examples of the City's continuous endeavours to be a city of opportunity, include partnerships with accredited social housing institutions (SHI's) to ensure the provision of affordable housing opportunities on well-located land (City of Cape Town, 2021b). Cape Town has also earned the reputation of being the events capital of Africa (City of Cape Town, 2017), and most recently, the City announced that Cape Town's Biovac Institute will be partnering with Pfizer and Biontech to manufacture Covid-19 vaccines from 2022 (City of Cape Town, 2021c). In the field of town planning, its Urban Planning and Design directorate has also been awarded numerous local and international accolades.

Although Development Management is often regarded as the stepchild in the planning family (as it includes the far less glamorous statutory functions of land use management, building development management, and their respective enforcement functions), the City's Development Management department is no stranger to innovation. In fact, its application management system, DAMS (Development Application Management System) is unique in the country (Crous, 2021a). DAMS is a SAP-based system that facilitates electronic management of land use applications, from submission through to performance evaluation, and which is fully integrated with the City's other business systems.

While DAMS has allowed the department to seamlessly continue to provide most of its development management functions throughout the Covid-19 lockdown periods – even during the initial 3-week Level 5 (highest level) lockdown period – the City did not always have such a system in place.

A Recent History of Record Management in the Development Management Department

The City of Cape Town covers an area of 2445 km^2, consisting of approximately 832 673 erven. It accommodated around 3.74 million residents in 2011 (when the last census in South Africa was conducted), which is estimated to have increased to 4 million by 2016, according to the City's 2016 Community Survey (Small, 2017).

The City of Cape Town became a metropolitan municipality in 2000, when a number of smaller municipalities were merged to form a 'Unicity'. The property data of all the former municipalities had to be migrated into one database. In terms of development management, a model comprising of a Head Office and 8 District Offices was established. The 'Unicity' required a standardised, integrated system to replace the heavily fragmented business processes of the former municipalities.

With the amalgamation came numerous challenges: not only did the erstwhile municipalities of towns like Bellville, Strand, Lwandle etc. all make use of different zoning schemes (27 in total), but they also all had their own record management systems, most of which were wholly paper-based.

According to Crous[1] (2021a), four of the municipalities had used a similar system (called 'Tracker') to capture development applications. At the time, there was no suitable module in SAP to replace this system, so Tracker was used as a basis for an enhanced Integrated Operational Management System (IPOS). IPOS was built on a front end of MicroSoft Access, with data stored in a SQL (Structured Query Language) database, and records from 18 different operational systems were migrated to it. IPOS was implemented in April 2004, and was in use until March 2014 (Crous, 2021a). IPOS only captured and provided a record of applications. Submission and processing of applications still relied fully on hard copy documents, which were kept on files. Data was captured manually as paper files were passed between case officers and other departments, which resulted in data integrity issues. Monthly reporting to STATSSA, as well as monthly, quarterly and annual reporting, were extremely resource intensive processes (Crous, 2021a).

As business needs changed, and as society steered towards a more digital way of doing business, it was clear that there was a need for a more comprehensive and integrated application management tool. The City therefore embarked on a process to develop its Development Application Management System.

Introduction of the Development Application Management System

It required a fair amount of lobbying to get the eventual budget of R40 million (approximately US$2.8 million at current exchange rates) approved to enable the City's in-house team, together with skilled SAP developers, to commence with the development of DAMS in January 2012 (Crous, 2021a). The DAMS had to meet a number of very specific requirements (Crous, 2021a), inter alia:

- developing enhanced, standardised business processes to improve service delivery;
- improving the City's e-Services portal to increase the digital customer base;
- improving the customer experience by making it simpler and more intuitive;
- providing an improved interface, with more varied services offered;
- enabling more effective data use for better decision making;
- improving and extending the City's mobile service functionality;

[1] Marius Crous, the Manager: Business Systems (Development Management) at the City of Cape Town since August 2000, is intimately familiar with the history of the development of business systems within the Development Management department. He shared his knowledge and insights via email (Crous, M. 2021a) and in an interview conducted virtually on 19 August 2021 (Crous, 2021b).

- providing improved checklists and the ability to review before submission; and
- providing the ability to capture outstanding fees (such as administrative penalties and development contributions) electronically and record the debt.

DAMS was implemented on 1 April 2014, and the City of Cape Town became the first (and thus far only) municipality in South Africa to operate such a system (Crous, 2021a). Implementation of the system was not entirely without challenges. Issues with integration between the City's various databases and systems were promptly resolved. A significant drop in performance was experienced immediately following implementation, which could mostly be ascribed to initial fears, negative attitudes to change, and uncertain expectations. However, productivity soon normalised.

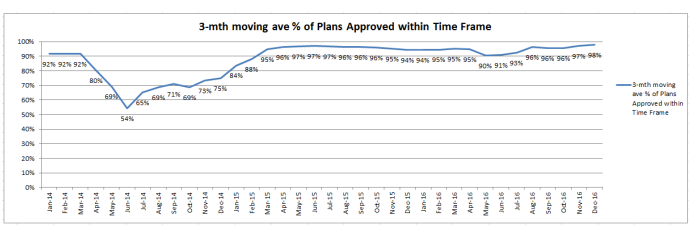

Figure 1. 3-month moving average percentage of building plans approved within the Building Act timeframes
Source: Crous, M. 2021a

Client training was also required, and although the City provided assistance with registration and training for residents and professionals, the electronic system was not equally enthusiastically embraced by all. As is typical in developing countries, some clients initially still preferred to submit hard copies of documents. For customers without access to internet, terminals were made available at all the respective District Offices. Officials offered assistance with e-services registration and the use of the online submissions portal.

What is DAMS, and What does it do?

The Development Application Management System (DAMS) is a SAP-based system that is linked with the City's Property Value Chain (PVC), and has full spatial integration with the City's Geographic Information Systems (GIS). DAMS allows for electronic submissions, electronic workflowing of applications, electronic decision-making, electronic document management, and comprehensive extraction of performance information. Applications can be fully managed online.

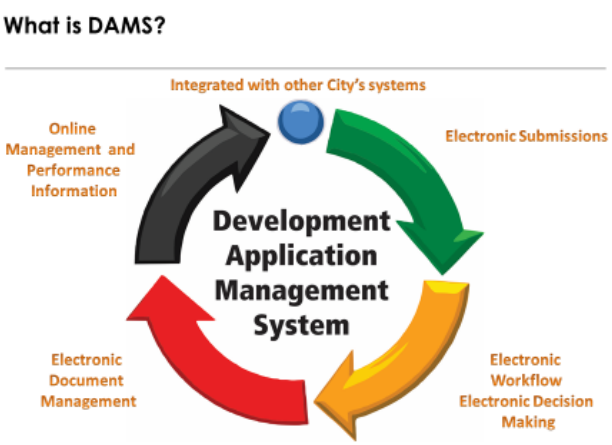

Figure 2. DAMS components
Source: Crous, M. 2021a

DAMS is fully integrated with the City's other systems, and according to Crous (2021a), it currently has approximately 2000 internal users and 3500 external customers who are registered to do online submissions via the City's e-services portal. It is managed by the Manager: Business Systems (Development Management) and a DAMS Support team within the department, and is maintained in-house by the City's own IT department.

Experience with DAMS has resulted in numerous benefits:

- As data is captured at source, it is more accurate and reliable, and is available in real-time.
- It is built on SAP architecture, and is fully integrated with the City's other digital systems.
- Building plan and land use applications are available online, and can be circulated electronically.

- Various management and operational reports are available to manage staff and departmental performance.
- Good governance and accountability is built into the processes.

DAMS and Remote Working

Submission of applications via the City's online portal proved to be extremely effective (City of Cape Town, 2019), namely that:

- Submissions can be made from anywhere in the world;
- Submissions can be made at any time;
- The system has numerous environmental benefits: there is no need for driving or commuting to offices, and it is paperless; and
- Applicants can monitor and track their applications at any time, from any place.

Prior to DAMS becoming exclusively online on 1 July 2019, only about 72% of building plan submissions, and 66% of land use applications were submitted through the City's e-services portal (Crous, 2021a).

At the time when online submissions became mandatory, nobody could have foreseen just how crucial the timing of the shift to operating 100% online would become a mere 9 months later, when the Covid-19 pandemic started wreaking havoc internationally.

DAMS made it possible for applicants to submit and manage their applications from anywhere and at any time, even during the most stringent lockdown levels. However, most of the 432 staff members of the City's Development Management department did not have quite the same level of working environment flexibility at the time.

After successfully addressing numerous logistical challenges to enable access to mobile IT infrastructure, core teams from each district managed to be fully operational from their homes from Friday 27 March 2020. The roll-out of additional mobile computing infrastructure, as well as increased data access and connectivity, gradually allowed all Development Management personnel to become fully operational from home. While some processes were constrained by the lack of external service providers (e.g. the South African Post Office not being able to deliver any notices by registered mail for a prolonged period), business could for the most part, continue as usual.

If it had not been for DAMS, and for moving to an online platform entirely in 2019, the department would not have been able to continue its level of service delivery during the initial lockdown levels. Very few, if any, other South African municipalities have been able to provide any meaningful level of development management services during that time (Crous M. 2021b).

A slight drop in the monthly number of applications submitted was experienced during the initial Level 5 lockdown period, but soon increased at a rapid rate. Similarly, the monthly number of finalised applications decreased, but recovered fairly quickly. It is notable that the recovery of application finalisations to pre-lockdown levels was much faster than the initial recovery of productivity levels when DAMS was initially introduced. On the one hand, this illustrates the enormous impact of the difference in attitudes towards a perceived 'forced' change (to DAMS in 2014), and towards an inescapable global change (due to Covid-19 in 2020). On the other hand, it also illustrates the mitigating impact of DAMS, given the drastic change in circumstances.

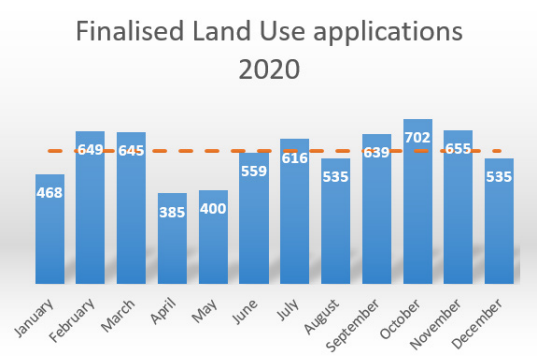

Figure 3. Land Use Applications finalised during 2020
Source: DAMS

In the period from March 2020 to April 2020 (i.e. the first two weeks of the Level 5 lockdown), the City approved 758 building plan applications, covering a floor area of 127 950m^2, and finalised 200 land use development applications. The value of the imminent building works associated with the building plans approved during this period amounted to over R1 billion / US$70 million (City of Cape Town, 2020b). By 31 May 2020, just prior to the lockdown level being adjusted to Level 3, this figure had increased to R3.1 billion / US$21.7 million, with 881 land use management applications having been finalised (City of Cape Town, 2020c).

For the year since lockdown commenced (from 27 March 2020 to 1 April 2021), an astonishing number of building plans (17 386), to the value of R16 billion / US$112.2 million, were approved – by staff working remotely via DAMS. When property developers and experts joined Executive Mayor Dan Plato for a discussion on what the City is doing to prioritise development and job creation, they expressed that doing business with the City of Cape Town was much easier and much more efficient, in comparison to other municipalities and metros (City of Cape Town, 2021a).

The Future of e-Services in Development Management

As customer needs are changing, the City is continuously looking at ways to be innovative and improve its services. At a corporate level, the City is embarking on a Corporate Application Review (CAR) project to replace the current ERP solution, which has now been in operation for over 20 years.

Work is also underway to replace DAMS with 'DAMS2' by mid-2022, at a cost of approximately R15 million / US$1 million (Crous, 2021a). DAMS will be moving to a different SAP platform, and a vigorous data cleansing project is currently underway to ensure that all data has been verified before being migrated to DAMS2. It is envisaged that DAMS2 would be more user-friendly, and would provide an improved interactive e-services portal. It will also result in improved, streamlined business processes, and better reporting on data. Mobile users, such as building and land use inspectors, will be able to use SAP UI5 technology to enable multiple device usage.

The Development Management department is also pursuing a number of other initiatives to improve the way in which business is conducted within a predominantly remote working –based environment. During lockdown, the department introduced 'hubs' for each district, to provide a central contact point for enquiries. Another exciting initiative is the 'Plan and Build It Right' platform, which was launched in August 2020 (City of Cape Town, 2020d). This online resource is available free of charge for built environment professionals, and provides pertinent information (both online and in the form of newsletters to subscribers) to assist the industry with land use and building plan submissions. Professionals identified from the DAMS business partner database were invited to subscribe to this platform and at present, there are over 2000 subscribers (Anderson,2021). Content of the newsletters and technical advisories addresses 'pain points' identified by means of surveys conducted among the professionals that regularly submit land use and building development applications via DAMS.

Conclusion

The pro-active and innovative approach taken by the City of Cape Town's Development Management department in developing DAMS has proven to be of great benefit in a rapidly evolving digital business environment. Other municipalities have been approaching them for guidance and assistance to set up similar systems (Crous, M. 2021b), as many of these municipalities are still dependent on paper-based data management systems, or are using databases like MicroSoft Access to keep track of applications. The department is continuing its endeavours to stay ahead of the curve and to remain a leader in the field of planning-related business systems, and is committed to providing excellent support to residents, customers and developers via e.g. its 'Plan and Build It Right' platform.

Beyond its Development Management Department, the City of Cape Town is also driving a number of initiatives to stimulate economic growth and create local em-

ployment opportunities in the wake of the COVID-19 pandemic. Many of these initiatives are focussing on Special Business Partners (SBP's) in specific sectors, through a multi-sectored, partnered approach that targets specific industries, and specific investors. One example is its 'BlueCape' SBP, which focusses on training people in marine manufacturing, as Africa is forecast to become the second biggest boat-building market in the very near future (City of Cape Town, 2021d). Other targeted industries include the textile manufacturing sector, where workplace experience is provided in partnership with the Cape Craft and Design Institute, and the call centre sector, which has a rapidly increasing footprint in South Africa. The City is also partnering with the Cape Innovation and Technology Initiative (CiTi) to provide training for entrepreneurs at its Khayelitsha Bandwidth Barn, and to train and coach unemployed youth in a digital literacy programme, in order to prepare them for the job market.

While Cape Town is a world-renowned destination that is visited by millions of tourists annually, its governing municipality is at the forefront of innovation to ensure and continually improve the wellbeing of its citizens and business partners.

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Remeasuring Residential Racial Segregation Across South African Metropolitan Areas

Kevin Parry

Abstract: *Despite 27 years of democracy, South African cities continue to exhibit the spatial patterns of racial residential segregation. This paper provides a measure of neighborhood segregation for the eight metropolitan areas, for the years 1996, 2001 and 2011, using Theil's entropy index applied to census data. The results show that Nelson Mandela Bay is the most segregated city, while Johannesburg is most integrated. All eight cities have become less segregated since 1996, with Mangaung recording the biggest move towards integration. Despite this, South African metropolitan areas remain largely segregated compared with cities in the United States.*

Keywords: *Residential racial segregation, South Africa, apartheid, Theil's entropy index*

Author's Profile

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Introduction

The spatial makeup of South African cities continue to exhibit the racially divided patterns of apartheid. The extent to which racial integration has occurred across urban space can be measured with the use of population census data and a segregation index. A number of segregation indices appear in the literature, including the popular index of dissimilarity and the lesser known Theil's entropy index of segregation.

In this paper, Theil's entropy index is used to measure segregation across South Africa's eight metropolitan cities, using data from Census 1996, 2001 and 2011. The results also show that South African cities are still highly segregated compared with cities in the United States. The United States has seen a decline in segregation since the early 1970s, partly due to market forces and partly due to legal and policy interventions. The study of residential segregation, and the comprehensive measurement of segregation across all cities and towns in South Africa, is a valuable tool that can inform the extent of social cohesion.

Racial Residential Segregation in South Africa

The practice of segregating race groups across residential space was a hallmark of urban spatial planning during apartheid. This practice was galvanised in 1950 when the National Party government passed the Group Areas Act (GAA), which set out to divide and designate "every square inch" (Goodlad 1996:1630) of land for each of the four race groups. The process involved the forced removal of non-white occupants to newly designated areas (Strauss 2019). Non-whites were barred from taking up residence in white designated neighbourhoods. The only recourse for non-whites were overcrowded townships located on the outskirts of city centres (Goodlad 1996).

The GAA significantly changed the shape and structure of South African urban space, resulting in cities that Davies (1981) describes as having dominant white CBDs, non-white townships on the outskirts, designated areas for various races, and physical buffer zones separating neighbourhoods.

Negotiations between liberation organisations and the

National Party government in the early 1990s brought an end to apartheid in 1994. The Abolition of Racially Based Land Measures Act of 1991 repealed the Group Areas Act, ending the legislated racial segregation of land. With the legislative foundations of apartheid gone, South African cities changed in a number of ways in the 1990s (Saff 2002). Rapid integration occurred in CBDs, eventually leading to whites moving out from city centres. Racial integration, but at a much lower scale, occurred in previously designated white neighbourhoods as other race groups moved in.

Measuring Residential Segregation

Research into residential segregation is important for governments, policy makers and urban planners concerned with creating healthy urban spaces. Segregation restricts access to services, fosters negative stereotypes, exacerbates socio-economic separation, and is often linked to lower levels of safety, health and employment (Donaldson and Kotze 2006, Lee *et al* 2008).

In the United States, studies show that non-whites living in segregated neighbourhoods tend to earn less and have lower educational attainment than non-whites residing in less segregated neighbourhoods, hamstrung by concentrated poverty and a lack of work opportunities (Boustan 2012). Segregation is "often portrayed as the root cause of social, economic, political and institutional exclusion." (Horn 2005:58).

Racial residential segregation is of interest to geographers. Not only is segregation a sociological phenomenon, but it is also geographical in nature (White 1983). As a geographical phenomenon, segregation can be considered as the uneven distribution of population groups across space. Taking the concept of geography into account, Massey and Denton 1988:282 define residential segregation as "the degree to which two or more groups live separately from one another, in different parts of the urban environment".

The task of how to measure residential segregation, as a spatial phenomenon, is a topic of much debate. Over the decades, researchers have proposed many segregation indices, with many of these relying on data from census tracts. Massey and Denton (1988) outlined the characteristics of twenty segregation indices according to five dimensions: evenness, exposure, concentration, clustering and centralisation.

One of the most widely used indices in the field, the index of dissimilarity, was introduced by Duncan and Duncan in 1955 (Massey and Denton 1988). The index shows the extent to which census tracts reflect the larger city in terms of racial composition. The index of dissimilarity has been used to measure residential segregation in South Africa (Christopher 2001, Christopher 2005, Horn 2005). International examples where the dissimilarity index has been used include the United States (Iceland *et al* 2002), Sweden (Malmberg *et al* 2018), England and Wales (Lan *et al* 2020), and Europe (Benassi *et al* 2020).

The index of dissimilarity has two drawbacks. The first is that it can only provide a measure segregation between two race groups at a time (Wong 1996). The second is that it returns only one result for the entire city. An index introduced in 1972, by Henri Theil, addresses these two concerns. Theil's entropy index of segregation is similar to the index of dissimilarity in that it also measures the extent to which the racial composition of census tracts differ to the racial composition across the entire city (Morse 2012). The advantages of Theil's entropy index is that it incorporates all race groups and provides values of diversity for all census tracts (Wong 1996).

Theil's entropy index consists of two steps, as outlined by Iceland (2004). The formulas below are from Parry and van Eeden (2014). The first step determines an entropy score E for each census tract in a city (Eu), as well as for the city as a whole (Es). E considers the proportional size of each population group and can be regarded as a measure of diversity:

$$E = \sum_{r=1}^{n} p_r \ln\left(\frac{1}{p_r}\right) \quad (1)$$

where n is the number of race groups residing in a census tract and p_r represents the proportion of the total population in a census tract that belongs to race group r.

The second step determines the entropy index H for the entire city. The values of Eu and Es from the previous step feed into this formula:

$$H = \sum_{u=1}^{n} \frac{T_u(E_s - E_u)}{T_s E_s} \quad (2)$$

where n is the number of census tracts in the city, T_u is the total population of a census tract, and T_s is the total population of the city.

H is a city-wide measure of segregation that can fall anywhere from 0 to 1. A value of 0 represents a situation where census tracts exhibit the same racial composition as the entire city (regarded as complete integration). The value of 1 represents a situation where each census tract is dominated by one population group (regarded as complete segregation).

The United States Census Bureau (2004) used Theil's entropy index to measure racial segregation in the United States. The index was also employed to measure unemployment, income and education segregation for cities in both the United States and France (Quillian and Lagrange 2016).

Applying Theil's Entropy Index to South African Metropolitan Areas

In 2011, 39% of South Africa's population lived in the country's eight metropolitan cities (Statistics South Africa 2012). Three of these cities (Johannesburg, Tshwane and Ekurhuleni) are located in the province of Gauteng, South Africa's economic hub. Mangaung is the biggest city in the centrally-located province of Free State, while the other four cities are located along the country's coastline. Johannesburg was the most populous city in 2011, home to 4,4 million people (Table 1).

Table 1. Population by race, Census 2011
Source: Stats SA, SuperWEB2 Census 2011 dataset

		Black African	Coloured	Indian or Asian	White	Other	Total
Buffalo City	N	642 753	45 442	6 241	58 258	2 506	755 200
	%	85.1	6.0	0.8	7.7	0.3	100.0
Cape Town	N	1 444 939	1 585 286	51 786	585 831	72 184	3 740 026
	%	38.6	42.4	1.4	15.7	1.9	100.0
Ekurhuleni	N	2 502 769	85 910	68 058	502 439	19 294	3 178 470
	%	78.7	2.7	2.1	15.8	0.6	100.0
eThekwini	N	2 540 441	85 908	573 334	228 406	14 272	3 442 361
	%	73.8	2.5	16.7	6.6	0.4	100.0
Johannesburg	N	3 389 278	247 276	216 198	544 530	37 545	4 434 827
	%	76.4	5.6	4.9	12.3	0.8	100.0
Mangaung	N	622 383	37 337	3 204	82 291	2 217	747 431
	%	83.3	5.0	0.4	11.0	0.3	100.0
Nelson Mandela Bay	N	692 731	271 469	12 838	165 426	9 650	1 152 115
	%	60.1	23.6	1.1	14.4	0.8	100.0
Tshwane	N	2 202 847	58 788	53 744	586 495	19 614	2 921 488
	%	75.4	2.0	1.8	20.1	0.7	100.0
Total	N	14 038 141	2 417 416	985 404	2 753 675	177 282	20 371 918
	%	68.9	11.9	4.8	13.5	0.9	100.0

South African census data for 1996, 2001 and 2011 contain population counts for the four race groups: coloured, black African, Indian/Asian and white. A fifth variable of 'other' was included in Census 2011 (Table 1).

For this study, Theil's entropy index was calculated for the metropolitan cities, for Census 1996, 2001 and 2011. As previously mentioned, census tracts (or, 'enumeration areas' in South Africa) are the main data source for many segregation indices. In South Africa, enumeration areas generally consist of 100 to 250 households (Statistics South Africa 2003). Population data was sourced from the smallest geographical level available from publically available census datasets. For Census 1996, the level of geography was the enumeration area, while for Census 2001 and 2011 it was the small area.

The officially designated boundaries of South African cities have changed over time. In order to make the data comparable across the censuses, a GIS (ArcMap 10) was used to select all enumeration areas from Census 1996 and small areas from Census 2001 that fall within the 2011 metropolitan boundaries. First, a spatial midpoint for every enumeration/small area polygon was created. The Intersect function in ArcMap was then used to determine which enumeration/small areas mid-points from 1996 and 2001 fall within the 2011 metropolitan boundaries. This method was not performed on the

Census 2011 small areas as these are aligned, by default, to the 2011 boundaries. Vacant enumeration/small areas were removed from the analysis and the race category of 'other' from the Census 2011 dataset was excluded.

The next step was to calculate Theil's entropy index for all eight cities across the three censuses. This analysis incorporated a suggestion made by Iceland (2004) — when calculating *E* in the first stage, the log should be set to zero if the proportion of a particular race group within a census enumeration/small area is zero.

Results and Discussion

According to this analysis, Nelson Mandela Bay was the most segregated of the eight cities in 2011, followed by eThekwini and Cape Town (Table 2). In 1996, *H* for Nelson Mandela Bay was 0.83 (with 1 being complete segregation and 0 being complete integration). The index edged lower to 0.70 in 2011, indicating that neighbourhoods within Nelson Mandela had become less segregated.

Table 2. Theil's entropy index of segregation for South Africa's largest cities (1996–2011)
Source: Author's own resource

City	*H* 1996	*H* 2001	*H* 2011
Nelson Mandela Bay	0.83	0.78	0.70
eThekwini	0.81	0.76	0.68
Cape Town	0.81	0.76	0.67
Buffalo City	0.77	0.71	0.63
Ekurhuleni	0.77	0.72	0.63
Tshwane	0.73	0.70	0.62
Mangaung	0.77	0.69	0.61
Johannesburg	0.69	0.63	0.57
All eight cities	**0.81**	**0.76**	**0.69**

Statistics South Africa (2016) previously published *H* values for Nelson Mandela Bay, eThekwini and Cape Town, using data from 1996 and 2011, that closely match those in Table 2.

The aggregate value of *H* for all eight cities decreased from 0.81 in 1996 to 0.69 in 2011. All eight cities followed this pattern (Figure 1). If the indices in 2011 are compared with those in 1996, Mangaung recorded the largest change in the index away from segregation, while Tshwane recorded the smallest change.

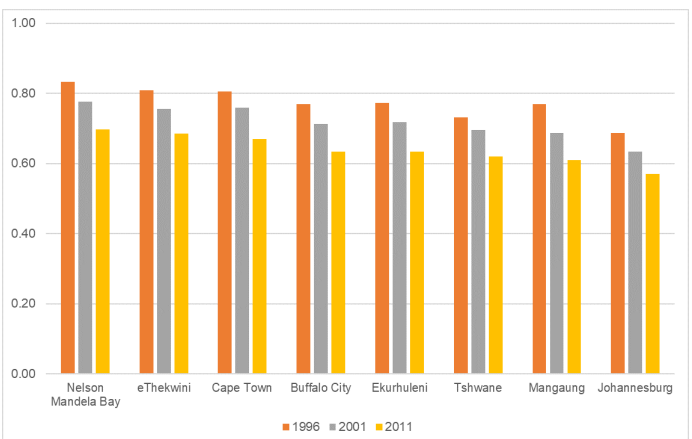

Figure 1. Theil's entropy index of segregation for South Africa's largest cities (1996–2011)
Source: Author's own resource

Despite the general decrease in *H*, South African cities are still highly segregated compared with their counterparts in the United States. Johannesburg was the least racially segregated South African metropolitan city in 2011 (*H*=0.57), but has a higher level of *H* than the most segregated city in the United States, Detroit, which recorded an *H* value of 0.49 in 2000 (United States Census Bureau 2004).

This reflects Christopher's (2005) observation that residential integration in South Africa has been sluggish at best since the end of apartheid, that the South African government has left the process of integration up to market forces alone (Christopher 2001). In addition to this, Irvine (2012) puts forward a mix of factors that are hampering racial integration in South African cities. These include economic barriers that hinder the majority of the black population's attempts to move to new

residential areas, white flight from CBDs, and the proliferation of gated communities.

Glaeser and Vigdor (2012) argue that cities in the United States have become less segregated due to a combination of government intervention and market forces. In terms of government intervention, various court rulings and laws throughout the 20th century slowly dismantled legal housing discrimination, culminating in the 1968 Fair Housing Act. The easing of credit standards have also provided non-white families with more choice in terms of where to live.

Ellen (2019) briefly mentions policy interventions in the United States. These include providing financial assistance or affordable housing to low income families, via voucher programmes for families or tax incentives for the development of housing. Ellen (2019) suggests that segregation can also be tackled by focussing on enforcing anti-discriminatory laws, and ensuring that city zoning practices don't perpetuate patterns of segregation.

Broadly, these initiatives in the United States suggests a two prong approach. The first is legal, which involves the removal of discriminatory barriers and enforcement of anti-discriminatory laws. The second is financial assistance to low-income families. The ultimate goal is to increase choice for those who want to move. As Glaeser and Vigdor (2012) state: "The freedom to choose one's location has helped reduce segregation".

Future Research and Conclusion

Any legal or policy interventions that government may put into place to help reverse residential segregation needs to be informed by data and measurement. Stats SA is planning to conduct the next population census in 2022. The project will provide the country with a wealth of updated demographic and household data at the smallest geographical level available. This provides a unique opportunity for a comprehensive measurement of segregation across all cities and towns in South Africa, providing a valuable tool that can inform any interventions that government may decide to implement. In time, geographers and policymakers can work hand-in-hand to measure and mitigate segregation in South African towns and cities.

There is also a great opportunity to broaden the measurement of segregation. The one weakness with the analysis outlined above is that the use of census tracts as the spatial basis on which segregation is measured ignores variations of segregation at other geographical scales (Lee *et al* 2008). Reardon *et al* (2008) attempts to address this problem by constructing segregation curves that express residential segregation at different geographical scales. Parry and van Eeden (2014) adopted a similar approach to measuring segregation in Johannesburg and Cape Town. Future studies adopting this method can potentially provide additional insight into the segregation patterns in South African towns and cities.

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IGLUS Executive Master

Our Executive Master in Innovative Governance of Large Urban Systems (IGLUS) responds to today's needs: growing cities evolve into metropolitan areas with their major infrastructures – transport, energy, buildings, water and greens – becoming increasingly interdependent, not the least because of the pervasive nature of the information and communication technologies. Managers and policy-makers concerned with such large urban infrastructure systems not only need to learn how to operate them, but must also become experts in maintaining, planning, and financing them in order to better respond to changing customer demand and evolving citizen needs. In short, the complexity of cities faced with ever more pressing challenges requires skills and expertise that our Executive Master's program offers.

iglus.org/overview-and-calendar/

IGLUS MOOCs (Massive Open Online Courses)

Management of Urban Infrastructures

The MUI MOOC provides an introduction to the principles of urban infrastructures management. In this MOOC, you will receive lessons from practitioners (City of Geneva, Veolia, Boston Consulting Group, CarPostal), experts (The World Bank) and academics (EPFL, CUNY). More information below.
iglus.org/management-of-urban-infrastructures-mooc/

Smart Cities

Smart Cities is a Massive Open Online Course that offers an introduction to the principles of management of smart urban infrastructure systems. It addresses the main challenges in management of Smart Cities during the transition and operation phases in the life-cycle of a Smart City.

iglus.org/smart-cities-mooc/

The "Innovative Governance of Large Urban Systems" is now live !

This course addresses the three phases of the urban value chain: planning, governance and regeneration. With lecturers from all around the world and concrete case studies, this MOOC will give you a comprehensive overview about the "Innovative Governance of Large Urban Systems".

https://iglus.org/innovative-governance-of-large-urban-systems-mooc/

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