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Sustainable urban development indicators in South Africa: Lessons for developing countries

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Abstract

The Department of Planning, Monitoring and Evaluation (DPME) published the medium-term strategic framework 2019-2024 for South Africa, outlining seven developmental priorities. These include a capable, ethical, and developmental state, economic transformation and job creation, skills and health, consolidating the social wage through reliable and quality basic services, special integration, human settlements and local government, social cohesion and safe communities, and better Africa and the world. However, the South African government faces numerous challenges in achieving sustainable urban development, including consistent supply of clean drinkable water, high unemployment rates, and high crime rates in urban areas. For that reason, this paper reflects on the challenges associated with the sustainability of urban development in South Africa based on selected indicators. By so doing, important lessons are drawn from South African experience for developing countries that share similar characteristics as South Africa. This conceptual article suggests that the South African government needs to establish clear monitoring and evaluation mechanisms for urban development indicators and prioritise providing basic quality services to the populace while creating a conducive environment for businesses to thrive and create employment.

Keywords: Crime; Employment; Poverty; Sustainable Urban Development; Water Quality

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1. Introduction

Developing countries are expected to experience most global population and urbanisation growth (Abubakar and Aina, 2019). In support of this view, Azami et al. (2015) noted that most people on the planet now reside in cities, and should the present patterns continue, the percentage of people living in cities will rise to two-thirds of the global population. In addition, Phosho and Gumbo (2022) mention that the world is seeing the most rapid urbanisation in history. Cities presently contain over half of the world's population, which is anticipated to increase to 5 billion by 2030. By 2030, cities will be home to around 70% of the population. Most of this urbanisation would occur in Africa and Asia (Phosho and Gumbo, 2022). This suggest that there is a pressing need to ensure that urban areas are ready to receive people who migrate from rural areas to settle or work in cities. In this sense, the project of sustainable urban development should be at the forefront in relation to urban development planning.

Azami et al. (2015) postulate that the idea of sustainable development is broad and subject to varying interpretations, which presents challenges when defining comprehensive and detailed indicators for sustainable development. Although there are numerous definitions to what constitutes urban development, Chen and Zhang (2020:2) state that "meeting the needs of the present without compromising the ability of future generations to meet their own needs" is how the Brundtland Report defined sustainable development. This definition of sustainable development is consistent with the descriptions given other researchers (Dhahir and Alwan, 2023; Ragheb et al., 2022). Dhahir and Alwan (2023) define urban sustainability as the planning process that strives to create a society that is self-sufficient, self-reliant, and able to survive in an urban setting. Importantly, sustainable development encompasses long-term social, economic, and environmental concerns for cities. It can be accomplished at multiple levels (national, regional, and local) by balancing the population's demands, aspirations, and future visions with the present reality and by strengthening security in metropolitan areas (Ragheb et al., 2022). Moreover, sustainability revolves around meeting present and future demands, with the primary concern being resource depletion (food, water, and energy) (Ragheb et al. 2022).

Urban sustainability is a crucial component of sustainable development, which cannot be accomplished until planning and evaluation take the community's sustainability into account (Azami et al., 2015). The regular and long-term monitoring of the advancement made towards the strategic objectives of sustainable development, as well as the assessment of many facets of sustainability, are made possible by sustainable development indicators (Alpopi, et al., 2011). Further, Alpopi et al. (2011) argue that using appropriate indicators is essential to implementing sustainable development in urban areas. Cities should make improvements to their economic, social, and environmental systems in order to achieve urban sustainable development and ensure that the equilibrium between human needs and natural resources is maintained (Azami et al.2015). Phosho and Gumbo (2022) point out that urban communities must work to strike a balance between social, environmental, and economic goals to meet the objectives of sustainable development.

Cities face various socioeconomic and environmental issues, including depletion of natural resources, biodiversity loss, climatic changes, air pollution, noise, garbage disposal, land usage, and access to potable water (Michalina et al., 2021). Azami et al. (2015) highlight that Asia faces the problem of providing basic utilities including food, water, shelter, transportation, education, and sanitation to both urban and rural populations while maintaining an ecological balance. The same challenges can be ascribed to the South African context. To shift towards attaining sustainable development goals, South Africa’s Department of Planning,

Monitoring, and Evaluation (DPME) has produced a medium-term strategy framework 2019-2024, outlining seven developmental priorities for South Africa. The seven developmental goals are: a capable, ethical, and developmental state; economic transformation and job creation; skills and health; consolidating the social wage through dependable and quality basic services; special integration; human settlements and local government; social cohesion and safe communities; and a better Africa and the world (Department of Planning, Monitoring, and Evaluation, 2021). Despite these good intentions, little has since been achieved concerning the preselected priorities towards sustainable development in South Africa. According to United Nations South Africa's Annual Results Report 2023, the implementation problems of the Sustainable Development Goals only listed entry security and unemployment as urgent challenges for the South African government (United Nations South Africa, 2023). However, available data suggest that there are various other important issues which serve as indicators that the South African government is far from achieving sustainable urban development.

Phosho and Gumbo (2022) argue that in 2000, the millennial development goals were set to be accomplished by 2015. Similarly, in 2015, the sustainable development goals were approved to be met by 2030. Despite advancements in the notion of sustainable urban development, policy implementation in cities remains limited. Developing countries face significant hurdles in implementing sustainable urban planning techniques due to fiscal restrictions, inadequate infrastructure, and limited management capacities (Ragheb et al., 2022). For reasons stated above, this paper reflects on the challenges associated with the sustainability of urban development in South Africa based on selected indicators. This allows major lessons to be derived from South Africa's experience for developing countries with similar characteristics. This is conceptual research that is based on a review of literature, including peer-reviewed journal articles, academic book chapters, and government reports that are publicly available online, particularly those related to sustainable development goals. As a starting point, the article presents an in-depth reflection on selected indicators of sustainable urban development from a South African perspective. This is followed by analysis of lessons for developing countries that can be drawn from South Africa's practices in pursuit of sustainable urban development. This research can be useful for researchers, policy makers and practitioners involved in urban planning both in South Africa and internationally.

2. Selected indicators of urban development in South Africa

Basnet and Shrestha (2019) assert that indicators refer to statistics and facts that help us assess our progress towards our ideals and goals. At the same time, Basnet and Shrestha (2019) acknowledge that measuring urban sustainability is challenging due to the unique background and characteristics of each location, necessitating distinct metrics. The most popular indicators of sustainability within the selected dimensions (economic, environmental, and social) and categories as described by Basnet and Shrestha (2019) and Michalina et al. (2021) are critically discussed in detail below. The discussion focuses primarily on what South African cities and towns have achieved and not achieved in respect of the selected sustainability indicators.

2.1. Water and sanitation quality

According to Statistics South Africa (2022), 98.1% of metropolitan households had access to tap water in 2022. This kind of access to water was most prevalent in Cape Town (99.6%), Johannesburg (99.5%), and Ekurhuleni

(98.9%). Unfortunately, Nelson Mandela Bay and eThekwini had the lowest access rates among metros (91.8% and 95.8%, respectively). Despite what appears be a successful story of water provision, Sheridan (2024) reports that 46% of drinking water in South Africa is regarded as unacceptable contributing to declining quality of drinking water supply. In the past ten years South African towns and cities have experienced significant decrease in terms of water quality. Themba Dam stream, which provides some of Hammanskraal's drinking water, is contaminated. When the water at the nearest treatment facility is not sufficiently filtered, the taps flow unclean. The problems have been attributed to the old Rooiwal wastewater treatment plant in Tshwane Metropolitan Municipality (Ngam, 2024). The fact that most towns (57%) do not alert water customers when water quality is compromised or not monitored suggests that residents have little faith in the quality of the water coming from their faucets (Department of Water and Sanitation, 2023). It is concerning when municipal officials appear to be ill-prepared to handle residents' complaints pertaining water quality. In that regard, Ngam (2024) state that "the City of Tshwane has dismally, delinquently and hopelessly failed to be accountable and responsive to the water needs of the Hammanskraal and surrounding communities for the past 16 years". The progress made by some of the South African cities and towns in terms of connecting households to piped drinking water is reversed by failure to ensure that water supplied to communities is of high quality and suitable for human consumption.

In 2022, a lower percentage of families in metropolitan regions suffered water outages (23.9%) while 34.9% South African households reported some problematic water supply services. Water outages were most common in eThekwini (61.2%), Nelson Mandela Bay (46.0%), Mangaung (37.9%), and Buffalo City (34.8%), with the least common in Cape Town (5.8%) and Ekurhuleni (11.8%) (Statistics South Africa, 2022). Households that were negatively affected with two-day or longer water outages had to use other sources of drinking water. For example, Statistics South Africa (2022) highlights that nationally, 30.9% of households used water from tankers or sellers, whereas 7.6% utilised water from springs, wells, dams, pools, or rivers and streams. Rainwater tanks (4.0%) and boreholes (2.9%) were also rather widespread. Almost one-third of households (32.0%) used stored water, while 11.6% did not have backup preparations. Sheridan (2024) points out that the state has resorted to companies to provide water to various areas because water provision has grown less consistent. The size of one of Johannesburg's tenders for water tankers and hoover trucks (honeysuckers) indicates how huge this has become into a business. Consequently, fraud and collusion are increasing. In other words, water supply inconsistencies create opportunities for corruption to flourish under the guise of temporary measures to address water crisis.

Many diseases can be avoided by practicing good environmental hygiene. It also has an impact on the preservation of natural resources, like water. Improving environmental sanitation relies heavily on proper sanitation (Statistics South Africa, 2019). In 2019, the most urbanised provinces, Western Cape (89.1%) and Gauteng (88.6%), had the highest percentage of flush toilets connected to public sewage systems, according to Statistics South Africa (2019). Statistics South Africa (2022) reported that in 2022 flush toilets were most used in Gauteng (87.3%) and the Western Cape (95.7%). However, there was a slight decrease in terms of the number of households connected to flushing toilets in Gauteng from 88.6 in 2021 to 87,3 in 2022, while the Western Cape Province improved from 89.1% to 95.7%. While the progress made in terms of increasing the number to households with flushing toilets in Western Cape is noteworthy, regrettably, Wasserman (2022) asserts that the City of Cape Town's sewage infrastructure has deteriorated in recent years. This was evidenced by the city's three major recreational facilities had been blocked for months owing to regular sewage spillages. Residents of Khayelitsha have protested against clogged drains and sewage spilling down their streets and into

their homes. Moreover, Khayelitsha's all-girl football club pitch was filled with sewage. Similarly, incidents of sewage spillages are widely reported in the eThekwini Municipality, which allows 700 million litres of raw wastewater to enter Durban's rivers, streams, and seas every day (Wasserman, 2022). Poor levels of sanitation are not only a threat to human health but also a huge threat to the environment.

2.2. Employment/Unemployment

South Africa's official unemployment rate was 32.1% in the last quarter of 2023, up 0.2% from the third quarter in 2023. Further, In the fourth quarter of 2023, the expanded unemployment rate declined by 0.1 percentage point to 41.1%, compared to third quarter of 2023. The expanded unemployment definition covers both officially unemployed (searched and available) and those who are available to work but are discouraged or have other reasons for not looking for work (Statistics South Africa, 2023a). There is a huge gap in terms of unemployment rate between four racial groups in South Africa, namely, Black Africans, Coloureds, Indians, and Whites. In that regard, Statistics South Africa (2023a) indicates that in the fourth quarter of 2023, the unemployment was as follows, Black Africans (36.1%), coloureds (21.7%), Indians (11.7) and Whites (8.5%). However, it is worth noting that a population group mostly affected by high unemployment rate as per statistics is the Black Africans. The statistics indicate that the unemployment rate in South Africa is extremely high. This challenge is also common in major cities or urban areas across the country. For instance, in the fourth quarter of 2019, eThekwini Metropolitan Municipality's unemployment rate fell to 20.9% from 21.5% in the third quarter of the same year. Over the same period, the labour force absorption rate increased by 0.2% (from 48.1% to 48.3%), while the participation rate declined by 0.3% (from 61.3% to 61.0%), showing that there are more people looking for work, but their chances of finding work have reduced (Department of Cooperative Governance and Traditional Affairs, 2020a). Unfortunately, Statistics South Africa (2023b) reports that the eThekwini 's unemployment rate went up to 21.8% in the third quarter of 2022 and increased further to 22.5% in the quarter of 2023. In the Free State Province, Mangaung Metropolitan Municipality has struggled to keep unemployment rate low. In the third quarter of 2022 the unemployment rate was 26.5% and consistently increased over a period until it reached 34.4% in the third quarter of 2023 (Statistics South Africa, 2023b).

Gwala et al. (2023) found that graduate unemployment which prevalent in South African urban areas is mostly caused by a lack of work experience, a negative economic climate, the impact of COVID-19, the type of institution attended, and skill mismatches with job opportunities. High unemployment rates may lead to reduced personal wealth, reducing the chance of self-employment (Mashau and Houghton, 2015). In line with this view, Azami et al. (2015) argue that several factors contribute to income loss, including unequal wealth and employment prospects inside cities and urban development plans that pay little regard to residents' sources of income. However, to tackle unemployment, the government should enable small and informal businesses to impact the labour market and innovate to satisfy community needs (Mashau and Houghton, 2015). Moreover, Mashau and Houghton, 2025) pointed out that additional support from government for small businesses will eventually result in an increase in the number of employers and success stories from the informal economy. This demonstrates that the emergence of informal businesses has a significant potential for employment generation. Another suggestion to help address unemployment among graduates, it is important to improve students' chances of matching their abilities to industry demands and labour shortages, educational institutions should provide sufficient support for career management and employability programmes (Gwala

et al., 2023). Whatever solution is proposed towards addressing the challenge of unemployment in urban areas, the focus should be on creating sustainable job opportunities and increasing employability of graduates.

2.3. Education

Statistics South Africa (2022) mentions that literacy rates can serve as an important social measure of growth. Literacy is defined as the capacity to read and write in at least one language. However, it is important to consider what is read and written, for what purpose, and with what level of proficiency. The level of literacy remains poor in some of the South African cities. For example, in the city of Ekurhuleni, 4% of the population lacks an education. In total, 43% of persons in the city have had primary and secondary education, with 41% having completed matric. Only 4% of persons in the City of Ekurhuleni hold an undergraduate degree (Department of Cooperative Governance and Traditional Affairs, 2020b). In contrast, the percentage of the population without a formal education in Buffalo City Metropolitan Municipality is 7.08% of that in the province and 0.98% of the national total. In 2018, there were 166,000 individuals in the Buffalo City Metropolitan Municipality who were matriculated alone. This represents 17.62% of the province's total matriculated population. A postgraduate degree and a matriculation certificate account for 23.44% of the province's population and 1.89% nationally. As a matter of fact, functional illiteracy in Buffalo City was 25.2% in 2020 (Department of Cooperative Governance and Traditional Affairs, 2020c). In South Africa, the number of functionally illiterate adults over 20 has decreased from 28,5% in 2002 to 10,2% in 2022. This includes those who have not passed Grade 7 or have not had any education (Statistics South Africa, 2022). The statistics presented above is concerning as it reflects negatively on the quality of education in two of the major South African cities. At the same time, the statistics presented above indicate huge discrepancies in terms of functional illiteracy, which could be attributed to different factors. In this regard, Azami et al. (2015) assert that inequitable distribution of educational services can be attributed to factors such as imbalanced education location, inadequate integrated management of urban services, inadequate attention to regional needs, and insufficient budget allocation. Songelwa et al. (2023) found that migration of learners from rural areas to urban schools has negative impact on the quality of teaching and learning due to overcrowding emanating from increased enrolments beyond capacity of schools. To enhance the quality of education in urban schools, the government needs to ensure that adequate resources are supplied, and teachers are capacitated, trained and granted developmental opportunities. Similarly, urban schools will require adequate funding, classrooms as well as learning materials necessary for teaching (Songelwa et al. 2023).

2.4. Poverty

South Africa has three official poverty lines that are based on income. These include the food poverty line (R760 per person per month in May 2023), the lower-bound poverty line (R1,058), and the upper-bound poverty line (R1,558) (Alexander, 2023). According to the World Bank Group (2020), a total of 13.8 million individuals (or 25% of the population) live in food poverty, whereas approximately 55.5 percent (30.3 million people) of South Africans live below the country's upper poverty level. Considering the poverty dimension in the City of Cape Town using the upper poverty level of R 1227 per person, there were 2 016 021 (45.9%) million people living in poverty in 2009 as opposed to 1 495 601 (43%) in 2019, meaning that there has been a 2.9% (520 420) drop in poverty over a ten-year period (Department of Cooperative Governance and Traditional Affairs, 2020d). Furthermore, using the higher poverty line criterion in the City of Cape Town, the

African demographic group has the highest percentage of people living in poverty, with 61.4% of its members falling into this category overall. The percentage of Africans living in poverty fell by 7.16 percentage points between 2008 and 2018, going from 61.40% in 2008 to 54.24% in 2018. In contrast to 0.89% in 2008, 0.92% of White people lived in poverty in 2018. The percentage of individuals living in poverty fell for both the Asian and Coloured demographic groups, by 3.09 and 5.54 percentage points, respectively (Department of Cooperative Governance and Traditional Affairs, 2020d). Similarly, Mangaung's poverty rate is still notably high. According to the criteria of the lower poverty level, 315 427 individuals (36.6%) are impoverished. Between 2001 and 2011, the percentage of people living below the poverty line fell from 44.3% to 42.2% in terms of intensity and extent of their way of living. In Mangaung, 50 156 households (18,9%) did not have enough money to purchase food during the previous 12 months in 2016 (Department of Cooperative Governance and Traditional Affairs, 2020e).

According to Alexander (2023), apartheid is to blame for the high number of impoverished South Africans because it was a clear attempt at social engineering, implemented to turn black South Africans into a cheap and plentiful labour force. By so doing, it kept most people out of any significant economic involvement. To reduce levels of poverty, the South African government introduced different forms of social grants which result in huge government spending. For instance, in the 2016–17 fiscal year, South Africa spent R164.9 billion on social protection, mostly through the distribution of social grants. In the 2019–20 fiscal year, the social grant expenditure was anticipated to increase to R209.1 billion (Alexander, 2023). While poverty is still a problem, it may be controlled with the help of programmes such social grants, which have proven to be effective in reducing it. But the main issue facing all branches of government is combating inequality and the relative deprivation that supports and enables poverty (Everatt, 2014). In other words, without addressing the issue of inequality, which is prevalent, it will perpetually remain an impossible task to reduce poverty in a meaningful way.

2.5. Crime

Creating secure and resilient South African cities thereby reducing crime, violence, and injustice should be seen as giant steps towards achieving Sustainable Development Goal 16. Conversely, most South African cities have become centre stage for criminal activities as well as havens for criminals. Galal (2024) mentions that in South Africa, murder and organised crime are prevalent. The country had one of the largest murder rates in the world in 2023, with almost 36 killings for every 100,000 people. This is attributable to the increased levels of crime recorded in urban areas. For example, In Cape Town during 2018–19, the top 12 police precincts were responsible for more than 40% of all reported crimes. More than half of this (21.93%) was accounted for by the top five police precincts, which were Nyanga (3.33%), Delft (3.59%), Kraaifontein (3.88%), Mitchells Plain (5.52%), and Cape Town Central (5.61%) (Department of Cooperative Governance and Traditional Affairs, 2020d). With a total crime index of 123, the City of Johannesburg Metropolitan Municipality has the second highest score. Within the City of Johannesburg Metropolitan Municipality, crime has declined at an average yearly rate of 4.09% from 2007/2008 to 2017/2018 (Department of Cooperative Governance and Traditional Affairs, 2020f). The South African Police Service's (2023) crime statistics shows that 12 police stations out of top 30 stations that recorded violent crimes were located in the City of Cape Town and City of Johannesburg. In that regard, each city accounted for six stations that recorded serious crimes. The majority of crimes reported nationwide are concentrated in nine main towns, despite housing 38% of South Africa's population.

Nelson Mandela Bay, Mangaung, Buffalo City, Msunduzi, eThekwini, Ekurhuleni, City of Tshwane, and the City of Johannesburg are the nine municipalities. 78% of carjackings, 58% of house robberies, 51% of common assaults, and 47% of homicides are reported to have happened in these nine localities, according to government figures (Urban Safety Reference Group, 2016).

Cowling (2024) state that with an approximate score of 82 index points, Pretoria, South Africa, came on top among African cities in the 2023 crime index. Cities in South Africa were among the continent's five most dangerous locations. Furthermore, with scores of 80.9 and 80.7, respectively, Durban and Johannesburg were behind Pretoria. Additionally, with a rating of about 83 index points, Pietermaritzburg, South Africa, came in top among African cities in the crime index in 2024. Cities in South Africa accounted for six of the continent's most dangerous regions. The index calculates the total crime rate in a given area. Crime levels are categorised as very high (above 80), high (60-80), moderate (40-60), low (20-40), and very low (below 20) based on the score (Galal, 2024). Concerning the determinants of crime and violent behaviour, Lamb (2023) argues that Violence is primarily committed by younger men, and is fuelled by socioeconomic factors like unemployment, poverty, and unfavourable living circumstances. Stress, frustration, and humiliation coupled with drug and alcohol misuse, unequal gender roles, and easy access to weapons, particularly firearms, can lead to aggressive behaviour. According to Lamb (2023), the economic performance is significantly harmed by high crime rates and inadequate police presence. Consequently, a high crime rate in urban areas may discourage potential investors. This situation could result in a high unemployment rate due to the absence of investment in urban areas. Newham (2005) had proposed several measure that need to be taken by South African government to fight crime decisively thereby restructuring the criminal justice system to guarantee prompt and effective deterrence; increasing the pay and headcount of officials in the three criminal justice departments (justice, prisons, and police); Launch and oversee social programs aimed at preventing crime; and, making investments in the criminal justice system's infrastructure, resources, and technology. The government needs to ensure that these suggestions are implemented successfully without which the goal of achieving secure and resilient South African cities would remain a pipe dream.

2.6. Energy and electricity supply

Notable progress in terms of connecting households to the grid is commendable, nonetheless loadshedding poses a new form of challenge. Statistics South Africa's (2022) household survey indicates that between 2012 and 2022, the proportion of South African households linked to the national power grid rose from 85.2% to 89.6%. The Department of Cooperative Governance and Traditional Affairs (RSA) (2020g) reported that approximately 33 800 (3.29%) of the City of Tshwane's households had electricity for lighting only in 2016; 872 000 (84.92%) had electricity for lighting and other uses; and 121 000 (11.79%) had no electricity at all. It becomes clear over time that 135 000 residences in the City of Tshwane did not have an electricity connection in 2006. This dropped to 121 000 in 2016 at a rate of -1.09% yearly. In contrast, approximately 2.3% of the 1,263,051 people living in the Nelson Mandela Bay Municipality lack access to power, compared to 84% who have prepaid electricity and 11% who have conventional electricity supplied to their homes (Department of Cooperative Governance and Traditional Affairs, 2020h).

Although efforts have been taken in the past to connect urban residents to electricity grid, Winkler (2023) asserts that South Africa is currently experiencing a serious electrical problem, with enforced power outages worsening year after year. Electricity is occasionally unavailable for 10 hours a day. The electricity shortage is

caused by recurrent outages at its older coal power units. This explains that the coal fired power plants are not maintained optimally. As a matter of fact, prolonged blackouts have hampered production, discouraged foreign investment, and jeopardised public safety (Nguyen,2023). Despite the problems associated with coal power plants, in 2019, coal power provided 87.7% of the country's electricity, a decrease from 93.6% in 2005 but still a significant majority. Nuclear power accounted for 5.4% of the 2019 supply, while wind and solar contributed only 2.6 and 1.9%, respectively (Coalition for Urban Transitions, 2021). Coal power is essential for supplying the country's energy needs, but its disadvantages are becoming more noticeable. Major sources of greenhouse gas emissions that contribute to air pollution and climate change include coal-fired power stations (Nguyen, 2023). Given the negative environmental associated with coal power plants, 10 GW of coal generating capacity would be decommissioned by 2030, and a further 25 GW by 2050, according to the Integrated Resource Plan (IRP). The majority of the extra generation capacity would come from solar and wind power. By 2022, President Ramaphosa suggested accelerating the IRP and adding 11.8 GW of additional power generation capacity, the majority of which would come from renewable sources (Coalition for Urban Transitions, 2021).

In South Africa, solar and wind farms generally only produce around 25% (solar) and 35% (wind) of their potential output under optimal conditions due to the erratic nature of sunshine and wind. Therefore, in order to meet a 6,000MW national gap with one of these technologies alone, 24,000MW worth of solar farms or 18,000MW worth of wind farms would be needed (Winkler, 2023). The introduction of renewable energy in South Africa also comes with its unique challenges. For instance, Raji (2023) asserts that one of the biggest obstacles to South Africa's plan has been financing. Notwithstanding the US and EU nations, including Germany, France, and the UK, pledging $8.5 billion at COP26, the negotiations were not without problems. For example, South Africa is concerned about the negative impact of loans on its current debt and wants a larger share of grant money to assist its $95 billion energy transition plan. Secondly, many of these workers (93 000 employees in the mining industry) may lose their jobs because of the shift to renewable energy. If Eskom, the national utility company in South Africa, goes ahead with its plan to close nine power plants by 2035, up to 55,000 jobs could be at risk. The number of employments under risk is expected to rise to 102,000 by 2050 (Raji, 2023). Thirdly, another obstacle is that, as one of the few industries in the country that is owned by people of colour, the government is reluctant to harm the coal business. On the other hand, environmental analysts are sceptical about the authenticity of the country's energy transition plans because of this issue. South Africa keeps investing in sectors that rely on coal to produce electricity, even though state-owned power utility Eskom intends to phase out about half of its coal-dependent power in the ensuing 13 years. Given the foregoing challenges, it can be argued that is imperative for the South African government to maintain a balance by conducting a cost-benefit analysis of replacing coal with solar or renewable energy sources. Gradually introduction of renewable energy is another important consideration. In line with these suggestions, Azami et al. (2015:159) states that when long-term, suitable solutions are found, sustainable development may provide a better future and meet people's fundamental needs.

2.7. Sustainable human settlements

A basic human need for physical safety and comfort is satisfied by shelter, and the quality of a household's housing is a significant indication of its members' general well-being (Statistics South Africa, 2022:29). According to a survey conducted by Statistics South Africa (2022:), approximately 83,2% of South African households were found to be living in formal houses in 2022, compared to 12,3% living in informal dwellings

and 4,3% in traditional dwellings. However, this improvement in terms of the number of households living in formal houses may decline due to multiple factors, which include urbanisation. For that reason, by 2030, the "Sustainable Development Goal Target 11.3" aims to improve inclusive and sustainable urbanisation as well as the ability of every country to plan and manage human settlements in a participative, integrated, and sustainable manner (Abubakar and Aina, 2019:7). According to Mycoo and Bharath (2021), a housing backlog makes it challenging for the state to provide adequate housing in urban settlements to ensure inclusivity, safety, resilience, and sustainability. Unequal access to housing and urban land is a physical manifestation of inequality.

The Department of Cooperative Governance and Traditional Affairs (2020a) states that roughly 25% of the population of the metro area lives in informal settlements. In order to prevent the social disruption that results from uprooting and relocating informal settlements to farther locations, most of the time these settlements are being improved. This depends on land purchase, which must go through a legally mandated process that could cause delays. According to existing funding levels and subsidies, as well as projected population increase throughout the period, housing backlogs, which stood at 385 000 units as of March 31, 2019, are expected to take 40–80 years to address (Department of Cooperative Governance and Traditional Affairs, 2020a). This explains the complexity of human settlement issues of which some may not be addressed expeditiously. for example, of the 265 560 households, 47% live in houses, 11.7% in informal structures (shacks), and 6.5% in a backyard flat. There are approximately 53 informal settlements in the Mangaung area, housing around 28,737 households in informal houses and backyard shacks. While the housing backlog currently stands at 31,149 houses, there are 27 informal settlements around and within Bloemfontein, 13 in Botshabelo, and 8 in Thaba Nchu (Department of Cooperative Governance and Traditional Affairs, 2020e). According to Palani (2023), a major contributing factor to the housing issue in urban areas is the mismatch between supply and demand. Due to issues including scarce land, stringent zoning laws, and drawn-out construction schedules, many cities are experiencing a severe mismatch between the supply and rising demand for housing. Moreover, Palani (2023) argues that population expansion and urbanisation also have an impact since more people are moving to cities in pursuit of better employment prospects, which raises housing demand.

Stevens (2022) states that since cost and availability of land for human settlement are frequent obstacles in most urban areas, it is crucial that the government agencies should identify and acquire unoccupied, underutilised, redundant, or otherwise non-essential premises can be used for human settlement purposes. In other words, the South African government needs to expropriate unoccupied and underutilised land with or without compensation to meet high demands for housing in the cities. Further, Palani (2023) suggests that urban redevelopment, mixed-use communities, and inclusionary zoning can all be supported by reviewing and updating zoning laws by cities. Socioeconomic diversity is preserved as neighbourhoods change thanks to inclusionary zoning, which requires new developments to include a specific proportion of affordable housing.

3. Lessons for developing countries

Regarding the provision of quality water and sanitation, developing countries will need to ensure that increased access to water implies supplying water that is suitable for human consumption and free from waterborne bacteria. In cases where water related complaints are brought forward, authorities in the cities should take full responsibility, thereby addressing concerns. Developing countries can adopt good practices

from South Africa in terms of the provision of flushing toilets in urban areas, but this exercise must be accompanied by the capacity to handle sewage systems in order to prevent spillages. Improving people's quality of living requires access to clean, safe drinking water as well as proper sanitation and hygiene (Hutton and Chase, 2017).

In terms of employment, the evidence presented above suggests that South African cities are currently struggling to create sustainable jobs for urban dwellers due to varied factors. South African cities have not done much to support informal business to encourage self-employment. This is one area that may need to be considered by some of the developing countries and ultimately turn some informal business into formal establishments, although these efforts will require government investments. McBride and Mustchin (2013) the significance of government involvement in job creation thereby funding skills development programmes and provide subsidies as well as grants to encourage employers' commitment to train unemployed persons.

Creation of sustainable employment opportunities ought to be accompanied by improving the level of literacy, which is an area where South African cities need to improve. In that regard, some of the developing nations may need to strive to increase literacy levels and try to avoid congestion in urban schools. The other important aspect is that South African cities are facing perennial challenges related to violent crime due to an ineffective justice system and other socioeconomic factors. An important lesson that can be drawn from these particular challenges is that developing nations need to avoid mistakes that were made by the South African government when it comes to the handling of crime, which includes prevention, investigation, and prosecution. Essentially, the criminal justice system of various developing countries will have to be more functional than that of South Africa to win a battle against violent crime. Implementation of different strategies to fight crime needs to be the main priority. According to Cozens (2002), to lessen the likelihood of offending as well as the fear of crime it imperative for urban planners to consider implementing crime prevention through environmental design. I other words, the physical environment should be designed in such a way that it dissuades any possible acts of criminality.

Most of the cities in South Africa are unable to provide sustainable power because they are mainly dependent on Eskom, which is a state-owned entity responsible for the provision of electricity to cities. Unfortunately, the supply of electricity has not been stable for reasons outlined above. While the South African government has made its intentions clear that it wanted to introduce renewable energy, it appears some of these decisions were made and implemented without consideration of some potential obstacles. Therefore, developing countries need to avoid South Africa's mistakes and introduce renewable energy gradually, considering the advantages and disadvantages of renewable sources of energy. Replacement of coal-fired power plants or other forms of power generation should not be undertaken impulsively without prior planning and investment in renewable energy. For this reason, Song et al. (2021) argue that when switching from coal to other energy sources, developing nations do encounter political opposition as well as legal constraints.

One of the most significant economic areas that supports sustainable urban development and prosperity is housing upgrading (Ibrahim, 2020). Key among challenges facing South African cities in relation to the provision of housing is lack of land. Without land, it is clearly impossible to successfully address human settlement issues, especially housing. While this challenge may not be exclusive to South African cities, it remains vital that cities in various developing countries should also strive to acquire land that is fit for human settlement and build quality houses for their citizenry. In cases where rezoning will contribute towards improving housing in urban areas, effort must be taken to implement such a plan.

4. Conclusion

This article has critically reflected on the sustainability of urban development in South Africa based on selected indicators. Having done so, crucial lessons were drawn from South African experience for developing countries that share similar characteristics as South Africa. The South African major cities have performed well in terms of improving in certain areas, such as water and sanitation. Although access has been enhanced in these areas, the South African cities have not been able to address concerns about unclean drinking water and sewage spillages. Some of the developing countries will have to avoid failures similar to those identified above. As such, governments will need to consistently monitor different developmental indicators to avoid any possible regress. Concerning education and poverty in urban areas, it is evident from a South African perspective that inequality and inequitable distribution of resources are responsible for perennial problems that ultimately translate to poverty. While it remains important for the South African government to avoid disproportionate allocation of resources in the fight against poverty and improving urban education, developing countries also have to ensure equitable allocation of resources in identified areas. The South African government has consistently battled with power cuts while also trying to introduce renewable energy sources. Political debate about whether coal-fired power plants should be replaced with renewable energy is an ongoing debacle. Nevertheless, the key issue concerning phasing out coal-fired power plants with renewable energy has to do with the gradual introduction of renewable energy while assessing costs and benefits. Importantly, South Africa and other developing nations will need to introduce functional short-, medium-, and long-term energy plans that should be accompanied by proper implementation. For developing nations to achieve most of their urban development indicators, they will need to enhance good governance as well as commitment to identified priorities.

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