6 SADC's settlement hierarchy and networks in support of cross-border regional development

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6.1 Introduction

The Southern Africa Development Community (SADC) is undergoing rapid urbanisation. Since SADC's establishment in 1980, the population has surged from 127 million to 363 million in 2020, with urban populations expanding by 133 million (UN-Habitat, 2022). As of 2023, urban dwellers constitute 47.6% of the region's population, and this proportion will likely exceed 50% within the next five years (Le Roux, 2023). By mid-century, approximately 60% of the population will reside in urban areas, emphasising the escalating significance of these evolving spaces. Cities will be instrumental in shaping the region's economic and social fabric and will become central to development and integration. However, they will also be the epicentres of inequality and climate change impacts (van Niekerk & Le Roux, 2017).

The current trajectory suggests that urban areas will likely witness escalating poverty, inequality, and service delivery challenges (Le Roux & Napier, 2022). Swift political, economic, and social transformations will influence the dynamics between major financial and governance hubs and smaller cities and towns (UN-Habitat, 2014: 29). While the traditional concept of 'growth poles' has become outdated, cities and settlements play diverse roles as economic gateways and service providers, closely interacting with their surrounding rural areas (Wisner, 2015: 156).

This chapter underscores the importance and benefits of establishing a regional settlement profile for SADC. It is divided into three sections: the first examines the development trends influencing the region's settlement patterns; the second emphasises the significance of cities and discusses the need for a shared regional settlement profile, using the South African settlement typology as an example; and the third offers an analytical profile that utilises combined datasets to analyse the evolving settlement landscape in SADC.

The SADC is rapidly urbanising. Since its 1980 inception, the population has ballooned from 127 million to 363 million by 2020. Urban populations saw a 133 million surge. As of 2023, 47.6% of the region's inhabitants live in urban settings. This figure is projected to cross 50% in the next five years (Le Roux, 2023). By 2050, urban areas will house about 60% of the populace, spotlighting their increasing relevance. These cities will mould the

DOI: 10.4324/9781003379379-8

regional socio-economic landscape, pivotal for development and integration. Yet, they're poised to become hotbeds of inequality and climate change consequences (van Niekerk & Le Roux, 2017).

Urban trajectories hint at rising poverty, inequality, and service delivery issues (Le Roux & Napier, 2022). Political, economic, and social shifts will redefine interactions between financial and governance epicentres and smaller urban clusters (UN-Habitat, 2014: 29). Though 'growth poles' as a concept may be passe, urban centres remain critical as economic conduits and service hubs, connecting intricately with neighbouring rural regions (Wisner, 2015: 156).

This chapter emphasises the merit of creating a SADC regional settlement profile. It unfolds in three segments:

- Review of regional settlement development trends;
- Spotlight on urban significance and the imperative of a shared settlement profile, with South African typologies as a case study; and
- An analytical outline leveraging collective datasets to dissect SADC's evolving settlement terrain.

6.2 Key development trends shaping SADC's urban spaces

The SADC region represents diverse countries regarding wealth, income, population size, and development challenges. The region includes Africa's only high-income country (Seychelles) and four of the continent's seven upper-middle-income nations (South Africa, Botswana, Mauritius, and Namibia). While the region's per capita income is far above the continent's average, it also contains some of its poorest and least developed nations. Four low-income countries (Malawi, DR Congo, Madagascar, and Mozambique) and seven lower-middle-income countries (Angola, Comoros, Eswatini, Lesotho, Tanzania, Zambia, and Zimbabwe) are also located in the region (Le Roux, 2023).

SADC has witnessed several dramatic development shifts since its establishment in 1980. Changes in regional integration and cooperation, democratisation, political stability, economic growth, infrastructure development, health-related challenges, repeated climate disasters, and peace and security challenges have all contributed to transforming the region's economic, social, and political landscape. A notable trend is the explosive growth of urban settlements (Le Roux & Napier, 2022).

6.2.1 Urbanisation and population growth

The SADC region is experiencing rapid urbanisation, putting immense strain on infrastructure, housing, and service delivery due to city authorities' inability to accommodate this growth sustainably. The slow response of governments in allocating land for housing has contributed to the rise of informal housing, as depicted in Table 6.1 (Le Roux & Napier, 2022). In 2000, 43 million people lived in urban slums in SADC, which doubled to 86 million by 2020 (World Bank, 2018).

Table 6.1 Percentage of urban dwellers living in informality in SADC

SADC countries	*Percentage of urban dwellers living in informality*	*Number of urban slum dwellers*
Democratic Republic of Congo	78	32.009,767
Comoros	69	174,930
Madagascar	67	7,193,894
Angola	63	13,732,533
Mozambique	55	6,583,219
Malawi	50	1,759,801
Zambia	48	4,022,981
United Republic of Tanzania	41	9,040,045
Namibia	41	547,722
Botswana	40	678,036
Lesotho	26	172,252
South Africa	24	9,571,315
Zimbabwe	22	1,229,487
Eswatini	11	37,601

Data source: Urban Indicators Database (United Nations, 2023) and World Development Indicators Database (World Bank, 2018).

The region's population is projected to grow from 391 million in 2023 to 614 million by 2043, with 72% of this growth occurring in urban areas. This underscores the importance of developing, managing, and enhancing the resilience of cities and towns (Mo Ibrahim Foundation, 2015 and United Nations, 2022).

The Democratic Republic of Congo, Angola, Tanzania, South Africa, Mozambique, Madagascar, Malawi, and Zambia are all countries forecasted to see significant urban growth pressure (Figure 6.1). Urban spaces within these eight countries will drastically change as cities expand and land uses change to accommodate the growing populations. The Democratic Republic of Congo hosts 37% of the region's informal urban dwellers.

6.2.2 Demographic structure

More than 40% of the population in the region is younger than 15 years, placing a high burden on providing educational and health services. Except for South Africa, Mauritius, and Seychelles, all countries are still to enter their first demographic dividend. There is some promising development as the region is edging closer to joining this dividend, with countries such as Zimbabwe, Namibia, Lesotho, and Eswatini set to enter their demographic dividend within the following decade.

6.2.3 Economic dynamics and poverty prevalence

The economy of SADC hinges on service industries, supplemented by sectors like manufacturing, agriculture, energy, ICT, and materials. South Africa's

SADC countries	2023 -2043 Growth in urban dwellers ('mil)	2043 Percentage Urban	2023-2043 Average population growth rate
Malawi	3.787	23.96	2.13
Eswatini	0.105	26.03	1.24
Zimbabwe	1.941	31.25	1.76
Comoros	0.187	33.54	1.96
Lesotho	0.274	38.56	0.58
Mauritius	-0.005	40.7	-0.09
Mozambique	13.75	48.94	2.42
Tanzania	28.42	49.52	2.47
Madagascar	12.26	53.51	2.16
Zambia	9.016	56.33	2.48
DR Congo	50.99	57.32	2.74
Namibia	1.03	68.3	1.52
Seychelles	0.012	69.45	0.19
Angola	25.22	74.9	3.08
South Africa	12.26	76.33	0.77
Botswana	0.812	81.35	1.32

Figure 6.1 Forecasts for the growth of urban dwellers in SADC

Data source: Forecasts generated by Ifs v 7.84 and available on the African Futures portal (ISS African Futures, 2023)

economy is more mature, while countries like Malawi, Zambia, Mozambique, Zimbabwe, Tanzania, and Angola lean on agriculture. Although SADC's GDP per capita outpaces other African regions, it trails globally. Notably, SADC holds the highest global inequalities (Cilliers, 2023b). Poverty is pervasive, with countries such as Madagascar, Malawi, the Democratic Republic of Congo, Mozambique, and Zambia recording above 50% poverty levels in 2023. The interplay of high informality, poverty rates, and population growth could escalate informality in cities, except for South Africa. SADC's economy primarily depends on service industries, complemented by sectors such as manufacturing, agriculture, energy, ICT, and materials. While South Africa boasts a mature economy, nations like Malawi, Zambia, Mozambique, Zimbabwe, Tanzania, and Angola rely heavily on agriculture. Although SADC's GDP per capita surpasses that of other African regions, it lags on a global scale. It's noteworthy that SADC registers the highest global inequalities (Cilliers, 2023b). Poverty remains rife, with countries like Madagascar, Malawi, the Democratic Republic of Congo, Mozambique, and Zambia reporting poverty rates over 50% in 2023. A mix of high informality, poverty rates, and population growth might further boost informality in cities, excluding South Africa.

6.2.4 Rural–urban migration

Given significant rural-to-urban migration, strategies to guide urban growth are essential. Several SADC nations have successfully enforced policies promoting sustainable urbanisation. For instance, the 2006 Malawi Growth and

Development Strategy slowed urbanisation rates through heavy rural investment. Similarly, countries like Botswana, Mozambique, and South Africa have implemented policies, each carrying unique triumphs and challenges. A more extreme example of retaining people within rural areas includes the 2006 Malawi Growth and Development Strategy, which resulted in slower urbanisation rates. This pro-rural policy saw the government investing heavily in rural spaces and their economies (agriculture), giving rise to the lowest urbanisation rate in SADC. Other countries such as Botswana, Mozambique, and South Africa have also implemented various urbanisation and migration policies to manage rural–urban migration, each with its successes and challenges. Urban policies in the region have been focused on addressing the challenges of rapid urban migration and growth in a sustainable developmental manner.

6.2.5 Conflict in the region

While SADC is relatively stable compared to other African regions, it has encountered conflict and instability, significantly affecting urban spaces' development. Civil wars in Mozambique and Angola, political instability in Lesotho and Zimbabwe, endemic conflicts in the Democratic Republic of Congo, the recent emergence of a jihadist insurgency in Mozambique, the struggle for democracy in South Africa, and violent political protests are just some of the events that have contributed to the instability of the region. The conflict has also profoundly impacted the development of urban spaces in SADC. Conflicts can redirect essential resources, change spending priorities, and inhibit new development. For instance, conflict in the Cabo Delgado region of Northern Mozambique led to a significant urban influx of internally displaced persons, burdening authorities and infrastructure. Conflict also impacts extractive economies (e.g., mining) and agricultural production and trade, impacting people's livelihoods in rural regions, forcing many to seek alternative means of income and adding to urbanisation.

6.2.6 Lack of critical infrastructure

The infrastructure backlog across Africa is exceptionally high. In 2019, electricity access was below 54%, and improved sanitation access reached 57% (Cilliers, 2023a). SADC's aggregate electricity access rate stood at 39% in 2019, while access to rural roads was below 55% (Le Roux, 2023). This lack of infrastructure can contribute to slum formation. Insufficient access to sanitation services, roads, and housing can lead to health threats and limit public transportation, impeding mobility and access to vital services. Often shelter and land are occupied in unsafe high-risk areas exposing these vulnerable communities to natural hazards such as floods, wildfires, and landslides. The lack of access to critical health services, amplified by the high disease burden, is evident in the region's high infant and maternal mortality rates.

Poor road access and limited public transportation limit mobility within and between urban spaces and impede access to critical services. Often these

cities need to be better connected to their rural hinterlands. A considerable infrastructure deficit plagues Africa. In 2019, only 54% had access to electricity and 57% had improved sanitation (Cilliers, 2023a). SADC's combined electricity access rate was just 39% in the same year, with rural road access even lower at 55% (Le Roux, 2023).

6.2.7 The impact of climate change

Despite minimal contributions to climate change, Southern Africa illustrates the intricate interplay between the physical climate and human systems. Over the past four decades, SADC has reported 36% of all weather-related disasters in Africa (Mbiyozo & Le Roux, 2021), causing substantial human and infrastructural losses. Dense urban areas in SADC are especially vulnerable to climate change effects, impacting significant populations and urban economies (Engelbrecht et al., 2022). Climate change will likely exacerbate many of SADC's existing challenges, leading to increased disaster losses (Le Roux, 2021).

6.3 The need for a shared regional settlement profile

Cities and towns are increasingly recognised for their significant role in addressing the Sustainable Development Goals and global climate change challenges (Parnell, 2015; Sassen, 2015; Aerni, 2016). The SADC region's development intertwines with the dynamics, opportunities, and risks within its cities, towns, settlements, and their hinterlands. These locations act as hubs for economic activities and are essential for service provision, including healthcare, education, water, and sanitation. Ensuring access to these services in urban areas is crucial for reducing vulnerabilities and inequalities (SADC, 2019; UNDESA, 2020). The subsequent section delves into the need for a shared regional settlement profile.

6.3.1 The importance of cities and network of settlements in SADC development

The SADC's Vision 2050 stresses the centrality of cities to economic activity and the provision of essential services. However, unchecked urbanisation can lead to challenges, including urban sprawl, the rise of informal settlements, and environmental degradation. Cities need to be resilient, well-prepared to address vulnerabilities, and capable of recovering from setbacks (SADC, 2020; UNDESA, 2020; Poelmann, 2014).

In the SADC region, enhancing regional connectivity, primarily through infrastructure, is essential for promoting regional integration and enabling sustained economic growth. Improved connectivity facilitates trade, increases accessibility, and consequently reduces disparities in rural areas. Strengthening the ties between urban and rural areas is vital to counter regional inequalities, ensuring development benefits are widespread across the region (SADC, 2012; AU, 2021). Collaborations at the city level can spur the creation of local solutions and accelerate knowledge transfer and best practices (OECD, 2022).

Table 6.2 Defining urban for countries in SADC

Country	*Considerations*
Angola	Geographic areas with a high population density and concentrated population groups with a high level of infrastructure.
Botswana	Agglomerations of 5,000 inhabitants or more where at least 75% of the economic activity is non-agricultural.
Comoros	Administrative centres of prefectures and localities with 5,000 inhabitants or more.
Congo	For 1984 and later, six communes: Brazzaville, Pointe-Noire, Dolisie/Loubomo, Nkayi, Ouesso, and Mossendjo.
Eswatini (Swaziland)	Localities officially designated as urban.
Lesotho	District headquarters and other settlements with rapid population growth and with facilities that tend to encourage people to engage in non-agricultural economic activities.
Malawi	Townships, town planning areas, and district centres.
Mauritius	Towns with proclaimed legal limits.
Madagascar	Centres with 5,000 inhabitants or more.
Mozambique	For 1997 and 2007: 23 cities and 68 towns/villages. For 1980, 12 cities: Maputo, nine provincial capitals, and the cities of Nacala-Porto and Chokwe. For 1950 to 1970, Conselho of Maputo and Beira. Estimates prior to 1980 were adjusted to take into account other urban settlements.
Namibia	The district headquarters and other settlements of rapid population growth with facilities that encourage people to engage in non-agricultural activities.
United Republic of Tanzania	For 1978 and later, all regional and district headquarters and wards with urban characteristics (i.e., exceeding certain minimal level of size-density criteria and/or with many of their inhabitants in non-agricultural occupations). No specific numerical values of size and density are identified, and wards are defined as urban based on the decision of the District/Regional Census Committees. For 1957 and 1967, 16 gazetted townships.
Seychelles	No official definition is available. In the present publication, prior to 1971, Victoria city proper (capital). For 1971 and later, the greater Victoria agglomeration plus districts with at least 1,500 inhabitants per inhabited square kilometre in 2002 (Cascades, Pointe Larue, Anse aux Pins).
South Africa	A classification based on dominant settlement type and land use. Cities, towns, townships, suburbs, etc., are typical urban settlements. Enumeration areas comprising informal settlements, hostels, institutions, industrial and recreational areas, and smallholdings within or adjacent to any formal urban settlement are classified as urban. The 1996 estimate was adjusted to comply with the 2001 census definition. Estimates for 1980, 1985, and 1991 were adjusted to account Transkei, Bophuthatswana, Venda, and Ciskei populations.
Zambia	Localities with 5,000 inhabitants or more and with a majority of the labour force not in agricultural activities.
Zimbabwe	Places officially designated as urban, as well as places with 2,500 inhabitants or more whose population resides in a compact settlement pattern and where more than 50% of the employed persons are engaged in non-agricultural occupations.

(Source: Extracted from (WorldPop, 2023))

Table 6.3 Comparative classification criteria for urban concentrations in Africa

Categories	*Description*	*Criteria for categorisation*	*Examples as used in respective typologies*
Metacity and megacity regions	Rapidly growing urban clusters or regions of more than 20 million (m), formed due to expansion, growth, and geographical convergence of more than one metropolitan area/other agglomerations	Criteria related to size and geographical area	Gauteng City Region
Megacities and Large Cities	Megacities: 10 million people or more	Description and criteria related to size	Cairo (19 m); Lagos (13 m); Kinshasa (12 m)
	Large cities: 5–10 million people	Description and criteria related to size	Abidjan (5 m); Dares Salam (5.4 m); Khartoum (5.3 m); Johannesburg (9.6 m); Luanda (5.7 m); Nairobi (4.1m)
Large cities	Large cities and medium cities: 1–5 million people. Typically includes cities that functioned as colonial and regional administrative capitals, either characterised by government service or more specialised functions, for example, mining or tourism	Description and criteria related to size	Casablanca (3.5); Cape Town (3.7 m); Dakar (3.7 m); Ouagadougou (2.9 m)
Small and new cities	Small cities: 0.5–1million	Description and criteria related to size	Bangui (0.81 m); Benghazi (0.76 m); Liberville (0.72 m); Tamale (0.51 m)
	Small and new cities About 100,000–500,000	Description and criteria related to size	Calabar (0.49 m); Windhoek (0.38 m); Zinder (0.39 m); satellite cities e.g. Eko Atlantic, Waterfall, Konza

(*Continued*)

Table 6.3 (Continued)

Categories	*Description*	*Criteria for categorisation*	*Examples as used in respective typologies*
Small urban towns and settlements	Fewer than 300,000 people	Description and criteria related to size	
	Urban Services & Regional and district headquarters; morphology; areas where there is a concentration of houses and institutions [sic], police stations, post offices, health centres, and streets	Administrative functions and morphology	Tanzania
	Settlements of at least 5,000 inhabitants	Size, morphology	Ghana
	Administrative headquarters with at least 2,000 inhabitants	Administrative functions and size	Cameroon
Urban municipalities	Official urban municipalities/urban administrative units recognised as such by law	Administrative functions	Rwanda, South Africa

**Source:* Authors. (Adapted from Slavova, 2016: 217; European Commission, 2014; Wisner, 2015; UNDESA, 2020; Paterson et al., 2017: 109 and Angelou, 2015)

6.3.2 The need for comparable information on SADC cities and settlements

Given this backdrop, there's an urgent call for a shared comprehension of the distribution of population, infrastructure, economic undertakings, and vulnerabilities within the SADC region. This shared understanding is essential to craft impactful regional development strategies. Mr. Charles Mushota underscored the importance of having a harmonised definition of cities for local urban SDGs and New Urban Agenda (NUA) indicators, and for monitoring and reporting on the Africa 2063 agenda at the 2019 SADC Regional Workshop in Lusaka. In a similar vein, Mr. Thomas Chiramba of UN-Habitat emphasised the value of such harmonisation for the sake of data comparison, agenda monitoring, and informed decision-making processes on sustainable urbanisation (UN-Habitat, 2019).

This collective understanding is paramount for various reasons:

- Identifying areas where populations and economic activities are concentrated to allocate resources effectively and target infrastructure

development. The SADC Regional Infrastructure Development Master Plan Executive Summary stresses the significance of infrastructure integration for regional progress (SADC, 2012).
- Understanding the relationship between urban population densities and economic growth, as emphasised by the Regional Assessment on Urban Vulnerability and Resilience in the Southern African Development Community Member States (UN-Habitat, 2020).
- Identifying vulnerable areas for effective disaster risk reduction and enhancing resilience (UN-Habitat, 2020).
- Gaining insights into cross-border economic activities, as described in the SADC – Regional Infrastructure Development Master Plan (RIDMP) – Energy Sector Plan (SADC, 2012).
- Recognising the disparities in development resulting from differences in population and economic concentrations.
- Grasping the environmental implications of these concentrations and understanding the subsequent need for environmental sustainability.
- Aligning policies across member states to encourage regional integration, using a consistent baseline to understand crucial urban transformations (Baltic Scope, 52015).

6.3.3 Challenges and considerations for comparable profiling of the SADC settlement network

The SADC's Vision 2050 stresses the centrality of cities to economic activity and the provision of essential services. However, unchecked urbanisation can lead to challenges, including urban sprawl, the rise of informal settlements, and environmental degradation. Cities need to be resilient, well-prepared to address vulnerabilities, and capable of recovering from setbacks (SADC, 2020; UNDESA, 2020; Poelmann, 2020).

In the SADC region, enhancing regional connectivity, primarily through infrastructure, is essential for promoting regional integration and enabling sustained economic growth. Improved connectivity facilitates trade, increases accessibility, and consequently reduces disparities in rural areas. Strengthening the ties between urban and rural areas is vital to counter regional inequalities, ensuring development benefits are widespread across the region (SADC, 2012; AU, 2021). Collaborations at the city level can spur the creation of local solutions and accelerate knowledge transfer and best practices (OECD, 2022).

Challenges in data granularity: Acquiring detailed and comparable data is often difficult. However, there are promising methods that offer value in exploring comparable yet settlement-specific indicators. A notable example is the Degree of Urbanization (DEGURBA) approach. This method, developed by UN-Habitat (2019), classifies areas into cities, towns, or rural zones based on uniform grids measuring one square kilometre. Each grid's character is evaluated based on population density, and the cumulative population of

contiguous grids determines their collective classification. When applied, this method revealed that regions like Botswana and South Africa have more urban areas than nationally recognised, implying significant implications for regional and urban policy.

Indicator selection amidst limited data: The choice of indicators for profiling is a contentious issue, especially given the limited data availability. Using metrics like population size and density for comparison can be problematic due to historical, contextual, and topographical variations. Many settlements in Southern Africa did not evolve through a Western perspective, which typically results in a predictable hierarchy. Instead, traditional African settlements, deeply connected to land and agricultural practices, have influenced the region's settlement patterns.

The spatial dynamics of settlement: Settlements are interconnected, forming spatial patterns and hierarchies. Moles et al. (2002) suggest that sustainability can be approached through these spatial patterns and typologies. Larger settlements and cities reach a threshold for infrastructure, especially concerning wastewater management. However, large settlement clusters without adequate infrastructure can pose significant risks. In developed contexts, larger settlements are often assumed to have more infrastructure and are more efficient to support their populations. This assumption may not hold in all contexts, particularly when settlements expand informally; and

Responding to change and population movement at scale: Furthermore, focusing solely on economic activity and formal infrastructure might overlook massive settlements formed due to disasters or conflicts. While these might not be classified as formal urban areas, they are likely permanent and necessitate comprehensive urban and regional policy solutions.

Additionally, the challenge of selecting appropriate indicators for profiling is accentuated by limited data availability. Profiling criteria, such as population size and density, might be contentious due to historical, contextual, and topographical variations. Settlement patterns in the Southern African region do not necessarily align with Western models.

6.3.4 Practice lessons: A settlement typology in support of national, urban, and rural development

A key challenge in the SADC region is the material and economic disparities between large cities, settlements, and rural communities. This disparity is partially due to the focus on resource extraction during colonial times, which led to infrastructure investment for accessing and exporting resources like coal, iron ore, and gold. South Africa's national Apartheid policies created separate homeland territories and settlement patterns without structure. The South African settlement landscape is heterogeneous regarding terrain, development level, historical development, and climatic and natural resource base. Settlements are unevenly distributed and do not fit into a theoretical model of the central place concept. Therefore, when allocating facilities,

consideration is needed for settlement hierarchy based on development, population, accessibility, redress, and social needs. Relying solely on numerical provision standards based on catchment population would not result in spatial equity and social justice. Exploring intra and inter-settlement patterns, trends, dynamics, and inter-relational shifts is critical to address these challenges and reshape settlements.

The CSIR/SACN South African Town Typology was developed to explore settlement dynamics at regional and national scales. It identifies functional towns and settlement areas in South Africa by utilising official data captured at the municipal scale and finer-grained information for settlement-level analysis (van Huyssteen et al., 2018). The South African mesozone dataset was developed in 2008 to cover the entire country, using a grid of 25,000 spatial tessellated units (Mans et al., 2018). These units represent settlements within main municipal features and contribute to the classification of places based on their relationships. Information on population and economic production assigned to the zones is used for profiling and categorisation.

The CSIR's South African settlement typology was revised during the National Spatial Development Framework (2018–2020) development to incorporate social service provision across rural regions and manage a network of cities, towns, and settlements. The revision included consideration for social facilities, services, and infrastructure networks. The typology identifies and addresses gaps in the settlement network, supports interventions for expansion or new settlements, and manages decline and negative growth in urban areas. It informs regional and national development policies.

The significance of such settlement typologies is underscored by van Huyssteen et al. (2018). They argue that these classifications support the integration of regional and local-level planning efforts in the region. Adopting shared profiles can boost cooperation amongst SADC member states, leading to improved socio-economic conditions. The African Development Bank (Mo Ibrahim Foundation, 2015) emphasises the need to merge national urban strategies, regional development models, and settlement typologies to maximise development returns.

The National Spatial Development Framework proposes the Regional-Rural Development Model, ensuring rural regions are connected to larger centres. Each region should have a well-connected regional development anchor as a key service and development node. Intra-regional trade between towns and villages is essential. The model emphasises the interconnectedness and interdependence between places, even if the closest major urban core is outside the region. It follows a hierarchical approach to service delivery, placing high-level services in the highest-order centres and lower-level services in smaller places.

The typology was developed with a multiplicity of policy and stakeholder inputs, explicitly aimed at informing policy – in 2007 as part of the National Spatial Development Perspective, in 2011 to inform the National Development Plan, and in 2013 and 2014 to support the Integrated Urban Development Framework (IUDF) and Rural Development Service Guidelines,

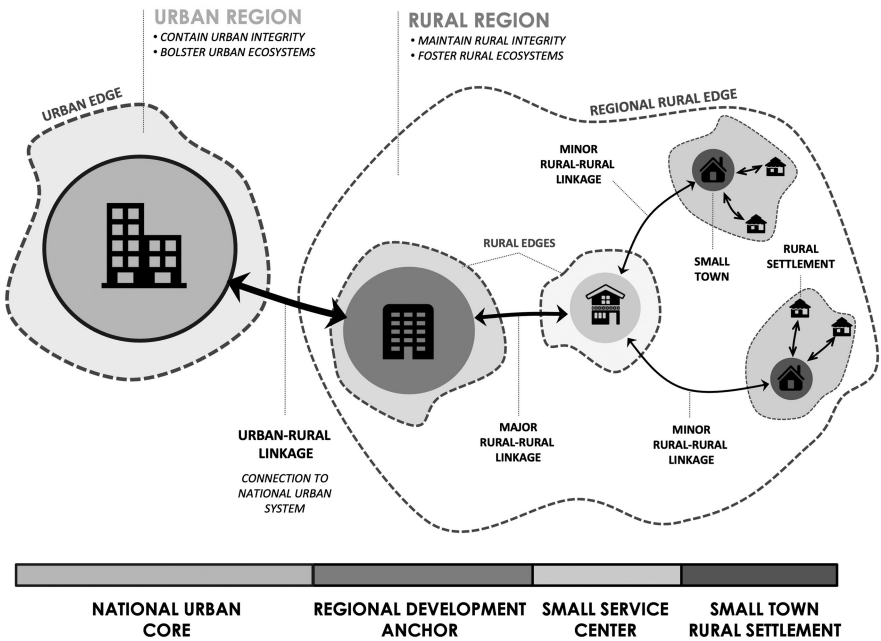

Figure 6.2 Regional-rural development model

Source: Department of Agriculture, Land Reform and Rural Development, 2023

respectively. It was also a critical item in the development of the National Spatial Development Framework in 2022.

The South African settlement typology illustrates the value of using a cross-section of information such as settlement size, spatial location, role within the hinterland, population, economic activity, and service functions. It provides a comprehensive understanding of settlements and informs development goals.

6.4 An analytical view of the region's settlement hierarchy

Recent studies have emphasised the significance of sharing information on the network of cities and settlements for both country-specific and cross-border planning, as well as for policy alignment (OECD, 2022: 67, 68, and 112). To address the existing information gap, the following considerations are crucial:

- Firstly, there is an imperative to recognise a broad spectrum of urban areas, ranging from expansive urban conurbations to smaller towns and settlement regions;
- Secondly, the analysis should employ relevant and consistent information; and

- Thirdly, the criteria should encompass at least two indicators: population size and density, as well as a measure of economic activity.

Lessons from the development of the South African settlement typology highlight the essential role of policymakers in shaping the typology. Their engagement ensures its relevance and applicability. The subsequent section offers a comprehensive desktop profiling, underlining the potential feasibility and advantages of such analytical methods.

6.4.1 The SADC settlement landscape

The settlement landscape within the SADC region is markedly diverse. Some regions showcase dense and concentrated settlement configurations, while others feature expansive territories with sparse settlements. Figure 6.3a visualises the regional settlement patterns, spotlighting several densely populated clusters like the metropolitan regions in South Africa, northern Zambia, southern Malawi, and pivotal cities including Luanda, Harare, Maputo, Arusha, and Dar es Salaam. Utilising Africapolis data allows for tracking settlement evolution at a granular level. Figure 6.3b pinpoints the most substantial settlement expansions from 2000 to 2015, revealing countries like Angola, the Democratic Republic of the Congo (DRC), Zambia, Tanzania, and Malawi as areas with multiple settlements, each witnessing growth beyond 100,000 within the 15-year span.

Conversely, nations such as Namibia, Lesotho, Swaziland, and Botswana have not observed analogous urban growth magnitudes. These cartographic representations also display a diverse settlement dispersion throughout the region. As elaborated in Section 6.3, a meticulously curated settlement typology can deliver a nuanced, consistent portrayal of regional settlement patterns and trends (van Huyssteen et al., 2018).

6.4.2 SADC settlement typology

Settlement typology involves systematically studying and classifying different types of human settlements. This classification incorporates factors like population size, spatial configuration, functional attributes, and economic endeavours. It offers planners and policymakers insights into regional variations and diversities. On a national scale, it can illuminate development patterns and trajectories. It's crucial to note the nuances when interpreting the typology across scales. For instance, while Windhoek stands as Namibia's preeminent urban centre, its significance diminishes when juxtaposed against the broader SADC landscape (Schmidt & Du Plessis, 2013).

A formidable challenge at the SADC regional level is the periodic unavailability or inconsistency of subnational data. For this study, the authors synthesised available data spanning the entire African section of the SADC for a uniform time frame. Two principal datasets were employed: the WorldPop

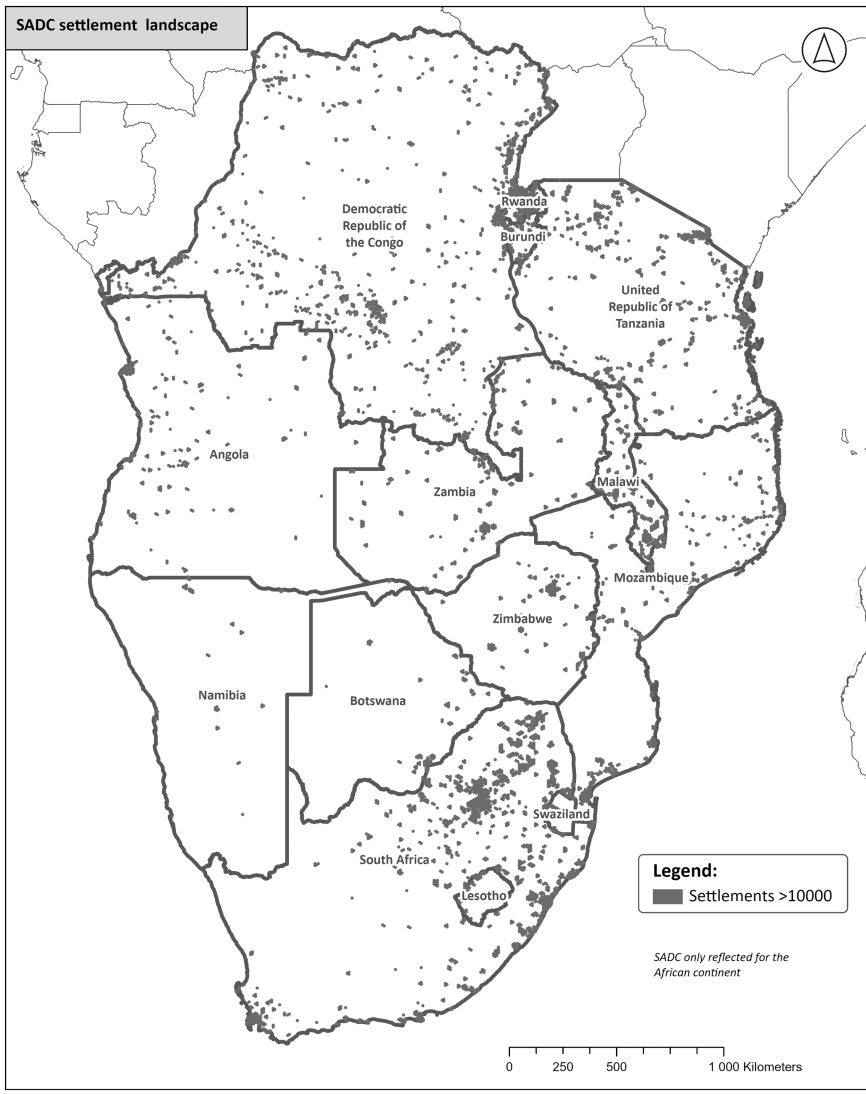

Figure 6.3a SADC (Africa) settlement landscape(a) and largest growing settlements 2000–2015(b)

Sources: WorldPop (2023) and Africapolis (2022)

database and Night light data. The WorldPop database amalgamates satellite imagery, census information, and diverse geospatial data to craft detailed population distribution models. These models predict population distribution dynamics across various scales (WorldPop, 2023). Night lights data, on the other hand, captures the intensity of human-generated artificial nocturnal

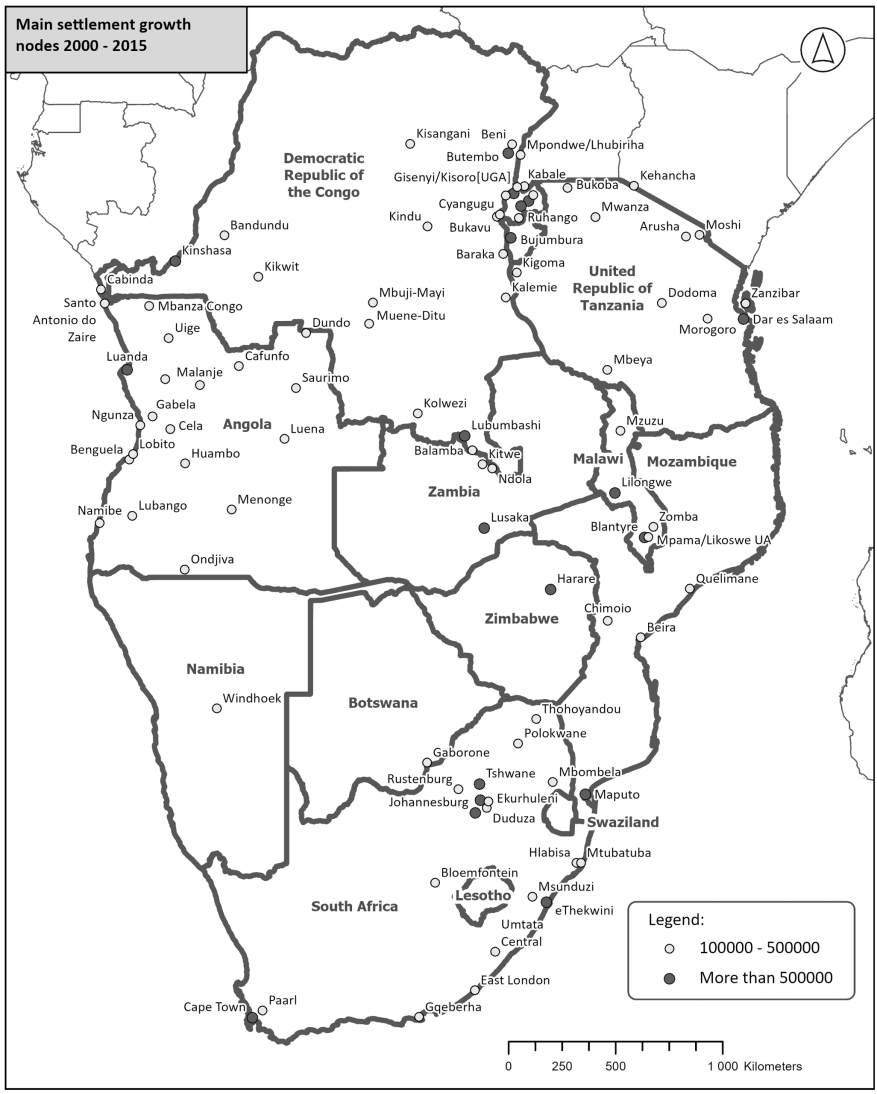

Figure 6.3b SADC (Africa) settlement landscape(a) and largest growing settlements 2000–2015(b)

Sources: WorldPop (2023) and Africapolis (2022)

illumination. This illumination emanates from sources like streetlights, industrial infrastructures, and commercial establishments. The rising prominence of this data reflects either the absence or the perceived imprecision of traditional economic statistics (Gibson et al., 2020). Additionally, the Africapolis dataset provides details on settlements spanning large metropolitan areas to

smaller towns with a minimum of 10,000 inhabitants (Africapolis, 2022). Given the variable granularity of these datasets, a spatial framework was imperative for their integration.

Due to this information's differing grain and scale, a spatial framework was required where these items could be integrated. A hexagon tessellation was created extending over the SADC countries on the African continent. This tessellation is small, with a hexagon side length of 5 km (hexagon area of 65 km^2). The WorldPop and Night light data items were converted to point features and then summarised onto the hexagon tessellation. The spatial footprint areas from the Afripolis data were also related to the hexagon base to reflect identified settlements. Settlement areas extracted from this base were sorted based on population and economic proxy totals. A six-level categorisation was developed using the South African Functional Town Typology as a guide. Table 6.4 lists the population as well as night light categorisations. Night lights data was sourced from the Defense Meteorological Program (DMSP) Operational Line-Scan System (OLS), which produced cloud-free composites (Earth Observation Group, 2023). The intensity of light per 500-metre pixel was related to the hexagon tessellation. The derived combined unit scores per settlement were used to gauge the extent or magnitude of potential economic activity. Similar to the population 'size', a 5-level categorisation was also derived for the economic proxy (Table 6.4).

It is acknowledged that the development level of countries across the region differs. Consequently, some would not have the large cities and city regions that, for example, are present in South Africa. It does, however, help to have a comparative measure across the region. Combining the population and economic proxy grouping results in a six-level typology (Table 6.5).

Table 6.4 Population and economic proxy classes.

Population class	*Population number*	*Economic proxy*	*Night light units*
Very large population	Above 1,000,000	Large economic production	Above 10,000
Large population	300,000–1,000,000	Medium economic production	5,000–10,000
Medium to large population	100,000–300,000	Low economic production	1,000–5,000
Medium population	20,000–100,000	Limited economic Production	Less than 1,000
Small population	Less than 20,000	Unknown	No data

Source: Compiled by authors, 2023

Table 6.5 Africa SADC region settlement typology.

Town order	*Description*	*Population ranges*	*Economic proxy ranges*
1	City regions	Very large population (Above 100,0000)	Large economic production
2	Cities and large regional centres	Large population (100,000–300,000)	Large to medium Economic production
3	Regional centres	Medium to large population	Range from large economic production to unknown if the population exceeds 100,000
4	Service town	Large to medium population (100,000–20,000)	Range from low to limited economic production
5	Small service town	Small population (10,000–20,000)	Range from low to limited economic production
6	Small town or local service town	Small population (Less than 10,000)	Range from unknown, low to limited economic production

Source: Compiled by authors, 2023.

Figure 6.4 reflects the spatial presentation of the settlement typology. When comparing the typology to the overall population distribution, the typology is a fair reflection of the spread and concentration of people across the region. Settlement patterns vary regionally, depending on differences in ecology, economy, and communication routes and on the distribution of natural resources and trading centres. With low production levels in most parts of the region, the observed general pattern is that of rural settlements where agriculture production and lifestyle still dominate (World Culture Encyclopedia, 2023). However, not part of the SADC region, Rwanda and Burundi are almost encapsulated by SADC member countries. When considering their small size, many settlements and their population [13462000 and 12551000, respectively (WorldData.Info, 2023)], they form a significant settlement area bordering DRC and Tanzania. The main road network is more developed along the region's eastern part with fewer east-west road and rail connections.

6.4.3 Main settlement nodes in the SADC region

To identify the dominant settlement clusters within the SADC region, the hexagon settlement base was employed alongside the Getis-Ord Gi* statistic. The resultant analysis spotlighted locations with dense populations neighboured

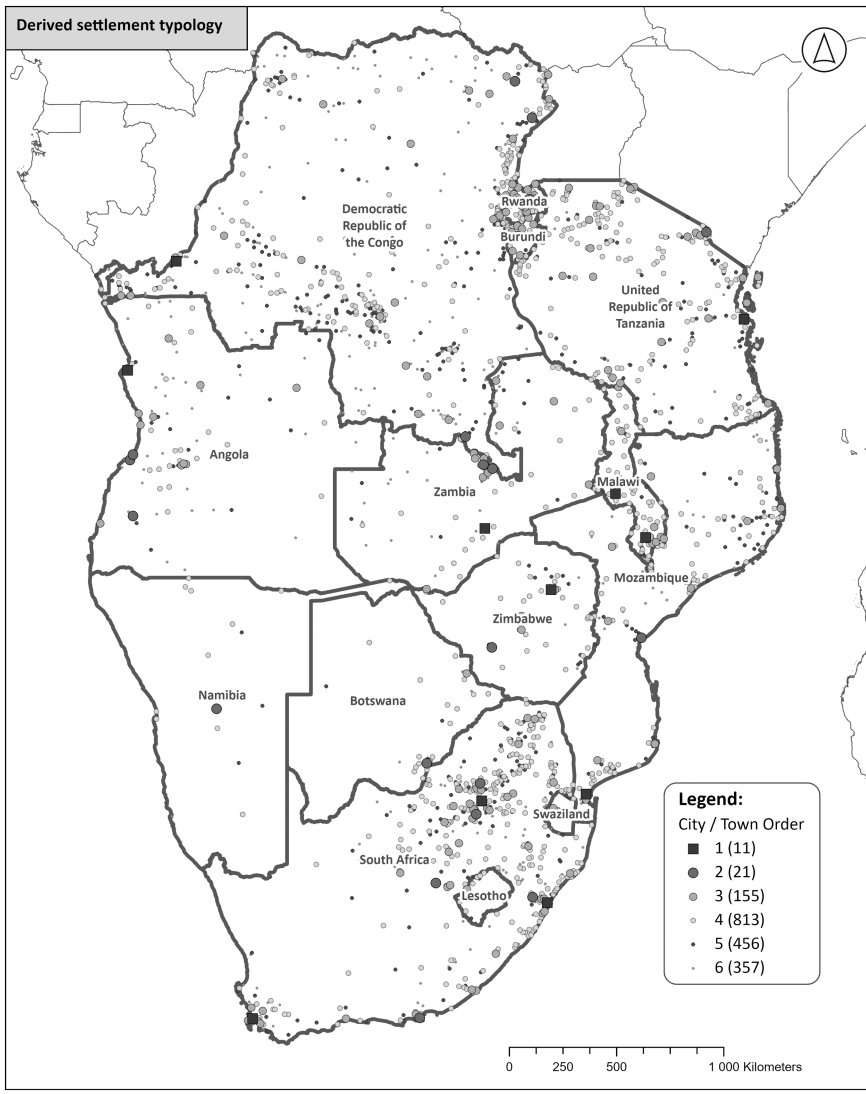

Figure 6.4 Settlement typology for the Africa SADC region (not including island nations)

by similarly populous settlements. Figure 6.5 visualises these population hotspots, emphasising only the most significant regional settlement clusters.

When overlaying the primary road and rail networks with these settlement clusters, certain infrastructure gaps become evident. Although various road categories exist, the emphasis here remains on the principal road network, which is notably underdeveloped in countries like Angola and the DRC.

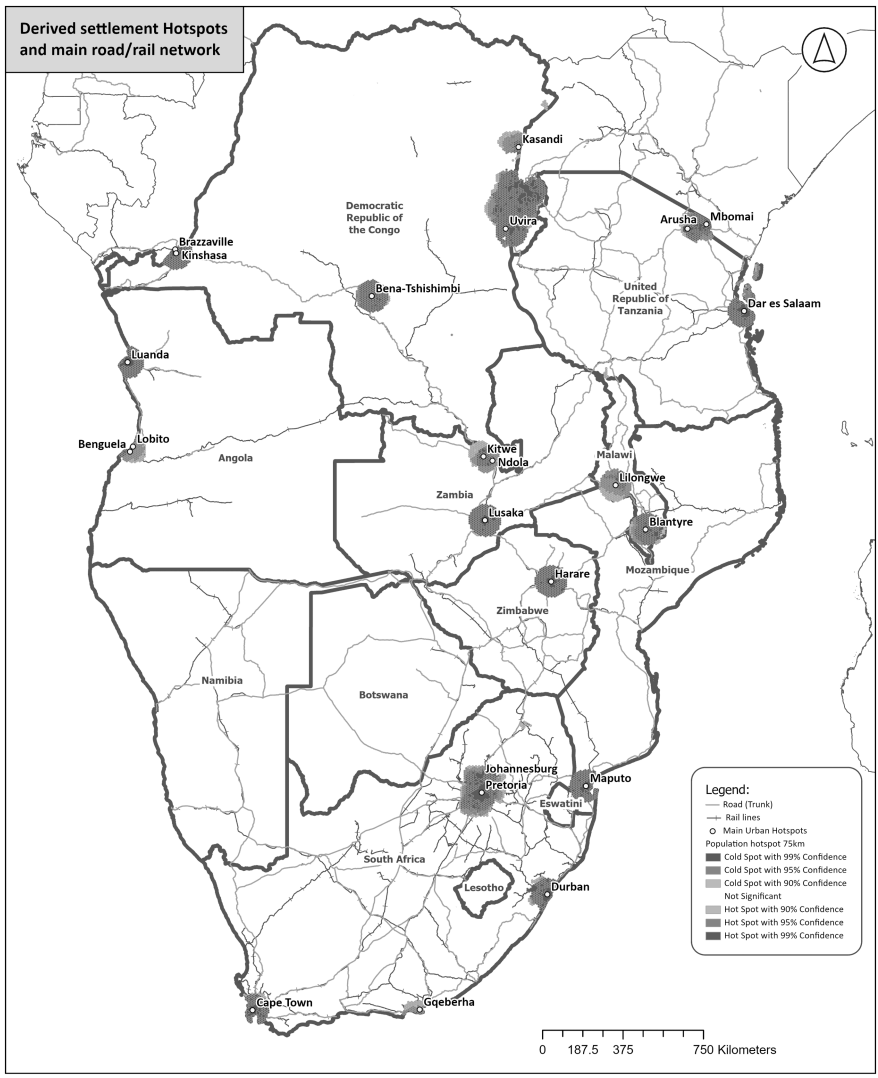

Figure 6.5 Main population centres based on hotspot analysis

6.5 Conclusion

It is evident that developing an integrated urban/settlement profile and/or categorisation for the SADC region has several benefits:

- It enables the comparison of different urban and settlement areas within the SADC region, which is crucial for policy-making and development planning.

- It supports understanding the unique characteristics of different urban and settlement areas and will help tailor policies and interventions specific to each area.
- An integrated typology or categorisation aids in the collection and analysis of data, which is essential for evidence-based decision-making.
- It can foster cooperation and collaboration amongst various stakeholders, including governments, non-governmental organisations, and the private sector, to address common challenges. Spatial and regional comparisons are also critical for understanding and managing shared hazards, particularly given the transboundary nature of some hazards in the SADC region.

This chapter accentuates the criticality of developing a cohesive regional settlement profile for the SADC. Such a profile fosters a shared comprehension of the distribution of people, infrastructure, economy, and vulnerabilities within the SADC. This understanding is pivotal for crafting and executing efficacious regional development policies and strategies, and guiding investments. The potential to replicate and refine the typology baseline exists, but integrating more detailed economic data can substantially elevate its precision and validity. Exploring interconnections between urban areas, towns, and settlements and discerning their interdependencies can spotlight gaps in regional functionality. On a regional canvas, a settlement typology facilitates cross-country comparisons, enriching the strategic planning process for the SADC region.

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