Spatial planning and land use management by-laws for climate resilience in South African cities

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DEDICATION

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Du Plessis A and Botes M "South African Municipalities" in Fiorno DJ, Eisenstadt TA and Ahluwalia MK (eds) *Encyclopedia of Climate Policy* (Edward Elgar 2024)

Du Plessis A *et al* Research Paper: Municipal Legislative Alignment and Enablement Analysis Report (South African Research Chair in Cities, Law and Environmental Sustainability and South African Cities Network (SACN) Built Environment Integration Task Team (BEITT), 2021)

Botes M "South Africa" in Wright JS (ed) *Legislative and policy initiatives towards the mitigation of climate change in African cities* (South African Research Chair in Cities, Law and Environmental Sustainability funded by Konrad Adenauer Stiftung, 2022)

Conference contributions and guest lectures

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Botes M "City-level law-making responsibility and authority towards urban climate resilience: a South African legal perspective" IUCN WCEL Colloquium - The Transformative Power of Law: Addressing Global Environmental Challenges, Oslo, Norway (October 2022)

Botes M *City-level spatial planning and land use management law as for urban climate resilience: A South African perspective* (IUCN Academy of Environmental Law Annual Colloquium: "Recovery •Resilience • Regeneration: Re-imagining Environmental Law", Queensland University of Technology, Brisbane (July 2022)

Botes M *City-level laws as instruments for urban climate resilience in South Africa* (1st International Online Workshop for Environmental Law PhD Students, January 2022)

Botes M *The future of environmental law as part of the public law responses to ecosystem services protection in urban areas* (ICON-S Mundo 2021 Annual Conference: The Future of Public Law, July 2021)

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ABSTRACT

Climate change is a significant threat that results in uncertainty and vulnerability. It poses the concomitant challenge of unpredictable weather patterns that are likely to lead to increased rainfall or temperatures, as well as extreme heat waves, sea level rise, floods, and droughts. The direct and indirect effects of climate change can be devastating, especially in developing countries, such as South Africa, that are more vulnerable. The vulnerability stems from compounded hardship as a result of widespread poverty and informality, severe spatial inequality, vast and continuing urbanisation, rapid population growth, unplanned and often unsustainable urban development, overexploitation of limited resources, and strain on overburdened and outdated infrastructure. The *status quo*, therefore, demands urban climate resilience.

This ability of complex systems (such as urban areas) to withstand, recover from, and adapt to the effects of climate change and its challenges can arguably be strengthened through a strong law and policy basis for decision-making and planning. This should ideally be situated at the local government level, given the role of cities as actors in climate governance, their unique proximity to communities, and their need to create locally tailored and targeted responses to climate change and enhance urban climate resilience.

South African law carves out the executive and legislative roles and authority of local government. It determines the rights, duties, functional areas of competence and accountability of municipalities. In the context of urban climate resilience, municipal planning, as a local government competence, emerges as an encompassing cross-sectoral competence of direct relevance, as it comprises spatial planning and land use management.

This thesis uses a mixed research methodology consisting of both a literature review and empirical research in the form of semi-structured interviews. The method is used to generate insights to inform the extent to which spatial planning and land use management by-laws can enhance urban climate resilience. The thesis explores

the meaning of urban climate resilience in general and for South Africa, and further ventures into an analysis of the role of the law and the scope of local government's legislative authority to enhance urban climate resilience through municipal planning by-laws.

Key words:

By-laws, climate change law, local government, municipal legislative authority, municipal planning law, South Africa, spatial planning and land use management, urban climate resilience

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100RC	100 Resilient Cities
AAI	Africa Adaptation Initiative
ACDI	African Climate and Development Initiative
ACPC	African Climate Policy Centre
Agenda 2030	Transforming Our World: The 2030 Agenda for Sustainable Development
AGSA	Auditor-General South Africa
AIDS	Acquired immunodeficiency syndrome
AR6	6th Assessment Report of the IPCC
ARC	African Risk Capacity Agency
Arup	Arup International Development
AU	African Union
BRT	Bus rapid transit
C40	Cities Climate Leadership Group
CBAs	Critical biodiversity areas
CBD	Central business district
CBOs	Community-based organisations
CCNRA	Climate change needs and response assessment
CCRIP	Climate change response implementation plan
CDS	City development strategy
Cent Eur J Public Policy	Central European Journal of Public Policy
CID	City improvement districts
CILSA	Comparative and International Law Journal of Southern Africa
CityRAP	City Resilience Action Planning Tool

CO_2	Carbon dioxide
COGTA	Cooperative Governance and Traditional Affairs
Constitution	*Constitution of the Republic of South Africa*, 1996
CPI	Consumer price index
CPIA	Country Policy and Institutional Assessment
CR4D	Climate Research for Development
CRPP	City Resilience Profiling Programme
CRPT	City Resilience Profiling Tool
DBSA	Development Bank of Southern Africa
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DFA	*Development Facilitation Act* 65 of 1995
DFFE	Department of Forestry, Fisheries and the Environment
DoH	Department of Health
DWS	Department of Water and Sanitation
ECA	Economic Commission Africa
EIA	Environmental impact assessment
Environ Dev Sustain	Environment, Development and Sustainability
Environ Res Lett	Environmental Research Letters
EPA	Environmental Protection Agency
ESA	Ecological support areas'
FACTS	Field Action Science Journal
Front Ecol Environ	Frontiers in Ecology and the Environment
GAR	Global Assessment Report
GBCSA	Green Building Council South Africa
GCRO	Gauteng City-Region Observatory

GDP	Gross domestic product
GEAR	Growth, Employment and Redistribution
Gen Not	General Notice
GG	Government Gazette
GHGs	Greenhouse gases
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GN	Government Notice
HIV	Human Immunodeficiency Virus
ICLEI	Local Governments for Sustainability
ICMs	Intermediate city municipalities
ICT	Information and communications technology
IDPs	Integrated development plans
IIA	Institute of Internal Auditors
IIAG	Ibrahim Index of African Governance
INDC	Intended Nationally Determined Contributions
Int. J. Environ.Res. Public Health	International Journal of Environmental Research and Public Health
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent power producer
IRPTN	Integrated Rapid Public Transport Network
ITDP Africa	Institute for Transportation and Development Policy Africa
ITPs	Integrated Transport Plans
IUDF	Integrated Urban Development Plan
IUWM	Integrated Urban Water Management

IWRM	Integrated Urban Water Resource Management
JSE	Johannesburg Stock Exchange
KZN	KwaZulu-Natal
LED	Local economic development
LGES	Local government equitable share
LGFF	Local government fiscal framework
LUMS	Land use management systems
LUSs	Land use schemes
MEA	Millennium Ecosystem Assessment
MFMA	*Local Government: Municipal Finance Management Act* 56 of 2003
MSA	*Local Government: Municipal Systems Act* 32 of 2000
MTEF	Medium term expenditure framework
Nat Hazard	Natural Hazards Journal
NBS	Nature-based solutions
NCCAS	National Climate Change Adaptation Strategy
NCCRWP	National Climate Change Response White Paper
NDC	Nationally determined contribution
NDP	National Development Plan
NEMA	*National Environmental Management Act* 108 of 1998
NEMAQA	*National Environmental Management: Air Quality Act* 39 of 2004
NEMBA	*National Environmental Management: Biodiversity Act* 10 of 2004
NEMICMA	*National Environmental Management: Integrated Coastal Management Act* 24 of 2008
NEMPAA	*National Environmental Management: Protected Areas Act* 57 of 2003

NEMWA	*National Environmental Management: Waste Act* 59 of 2008
NHA	*National Health Act* 61 of 2003
NHI	National Health Insurance Bill (B11 – B2019)
NHIA	*National Health Insurance Act* 20 of 2023
NHIA	*National Health Insurance Act* 20 of 2023
NMT	Non-motorised transport
NPC	National Planning Commission
NUA	New Urban Agenda (2017)
NWA	*National Water Act* 36 of 1998
NWRS	National Water Resources Strategy
OECD	Organisation for Economic Co-operation and Development
OHCHR	Office of the High Commissioner for Human Rights
OHSC	Office of Health Standards Compliance
OHSC	Office of the Health Standards Compliance
PELJ	Potchefstroom Electronic Law Journal
Phil. Trans. R. Soc. A	Philosophical Transactions of the Royal Society A
Phil. Trans. R. Soc. B	Philosophical Transactions of the Royal Society B
PLoS One	Public Library of Science One
PPE	Personal protective equipment
PPP	Public private partnership
PYEI	Presidential Youth Employment Initiative
RDP	Reconstruction and Development Program
SABS	South African Bureau of Standards
SACN	South African Cities Network
SAHRC	South African Human Rights Commission

SAICE	South African Institution of Civil Engineering
SAJELP	South African Journal of Environmental Law and Policy
SALGA	South African Local Government Association
SANS	South African National Standards
SAPL	Southern African Public Law
SAPS	South African Police Service
SDBIP	Service delivery and budget implementation plan
SDF	Spatial development framework
SDGs	Sustainable Development Goals
SEA	Socio-Economic Analysis
SEIAS	Socio-economic Impact Assessment System
SEMA	Sector Environmental Management Act
SES	Socio-ecological systems
SMEs	Small and medium-sized enterprises
SOEs	State-owned entities
SPLUMA	*Spatial Planning and Land Use Management Act* 16 of 2013
Stats SA	Statistics South Africa
Stell LR	Stellenbosch Law Review
Structures Act	*Local Government: Municipal Structures Act* 117 of 1998
TOD	Transit oriented development
UCCRN	Urban Climate Change Research Network
UCLG	United Cities and Local Governments
UN	United Nations
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNECA	United Nations Economic Commission for Africa

UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UN-Habitat	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
URS	Urban renewal strategy
US	United States of America
USCA	United States Court of Appeals
UW	Umgeni Water
WEF-nexus	Water-energy-food nexus
WGI	Worldwide governance indicators
WHO	World Health Organisation
WSAs	Water services authorities
WSDPs	Water service development plans
WSPs	Water service providers
WSUD	Water-sensitive urban design

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CHAPTER 1 INTRODUCTION

1.1 Background

Climate change is a global challenge threatening ecological survival.[1] The adverse effects of climate change are felt disproportionally in developing countries, such as South Africa, because they are home to poor and more vulnerable nations, have warmer climates and are more reliant on climate-sensitive sectors for their livelihoods and economic growth.[2] Climate change also brings forth challenges such as increased temperatures, rising sea levels and floods, droughts, veld fires, and changes in weather events like increased rainfall and extreme heat waves.[3] This is now proven to impact city infrastructure, municipal service delivery, and access to water, food and energy.[4]

Climate change affects the livelihoods, health, and well-being of people in city areas, where the majority of the world's population lives.[5] Urban areas,[6] particularly in developing countries, are experiencing vast urbanisation, rapid urban settlement

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1 Intergovernmental Panel on Climate Change (IPCC) *Summary for Policymakers Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (AR6) 5-14.

2 Article 7(3) of the *UNFCCC Conference of the Parties, "Adoption of the Paris Agreement"* (2015) UN Doc FCCC/CP/2015/L.9/Rev/1 (Paris Agreement); Addaney and Cobbinah "Climate Change, Urban Planning and Sustainable Development in Africa: The Difference Worth Appreciating" 4; Wade and Jennings 2015 https://bit.ly/3JhIUYj; United Nations (UN) General Assembly 2019 https://www.un.org/press/en/2019/gaef3516.doc.htm.

3 Revi *et al* 2014 *Environment & Urbanization* 12; Addaney and Cobbinah "Climate Change, Urban Planning and Sustainable Development in Africa: The Difference Worth Appreciating" 4.

4 United Nations Environment Programme (UNEP) and United Nations Human Settlements Programme (UN-Habitat) *Global Environment for Cities-GEO for Cities: Towards Green and Just Cities* 10; Arneth *et al* "Framing and Context" 84-85; UNFCCC *Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries* 8-10; OECD *Climate Resilient Infrastructure: Policy Perspectives* 4; Revi *et al* "Urban Areas" 538; Satterthwaite 2013 https://www.iied.org/how-does-changing-climate-impact-urban-poverty.

5 Addaney and Cobbinah "Climate Change, Urban Planning and Sustainable Development in Africa: The Difference Worth Appreciating" 4; UN *World Urbanization Prospects: The 2018 Revision* 1; Ritchie and Roser 2018 https://bit.ly/3bYpk4W.

6 "Urban areas" and "cities" are used interchangeably in this study. In the context of this study, "urban areas" refer to complex systems made up of ecological, social, economic, and technical components and are characterised by a combination of built-up areas, natural and human made water bodies (so-called blue patches) and gardens, parks, and land (green patches). See Douglas 2012 *Current Opinion in Environmental Sustainability* 385; Mundoli, Unnikrishnan and Nagendra 2017 *Decision* 105. See also para 2.2.4.1 below.

and population growth.[7] Urban areas are perceived to be economic hubs, expected to offer better livelihoods and opportunities.[8] Resultantly, urban areas are susceptible to a greater influx of people, more human activity, and a greater demand for services and natural resources.[9] Rapid and uncontrolled urban growth is coupled with a mounting housing crisis, more informal settlements and slums, a lack of or inadequate access to basic public services and energy, as well as high rates of urban poverty and unemployment that put great demands on governments.[10] The impacts of climate change exacerbate these challenges.[11] The above accentuates the need for urban climate resilience, as explained below.[12]

1.2 Climate resilience in cities

1.2.1 General dimensions of urban climate resilience

In unravelling the rationale behind the drive towards urban climate resilience, it is important to understand the term "resilience".[13] The Intergovernmental Panel on Climate Change (IPCC) defines resilience as:

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7 UN-Habitat *Global Environment for Cities-GEO for Cities: Towards Green and Just Cities* 22; UN-Habitat *World Cities Report 2020* 2; UN-Habitat *The New Urban Agenda Illustrated* xv; Cohen 2014 *Technology in Society* 63-64; Bhattacharya 2002 *Economic and Political Weekly* 4219-4220.

8 Spires *et al Building Resilience in African Cities: A Think Piece* 5; The Rockefeller Foundation and Arup International Development (Arup) *City Resilience Framework* 3; UNDP *Issues Brief on Urban Climate Resilience* 1; UN World *Urbanization Prospects: The 2018 Revision* 3; Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 1-2.

9 Chinzila *et al* "Competing Interests in Urban Biodiversity Management in the Context of a Changing Climate: A Case Study of the Giba Gorge Environmental Precinct, South Africa" 217.

10 Broto 2017 *World Development* 2-3; Addaney and Cobbinah "Climate Change, Urban Planning and Sustainable Development in Africa: The Difference Worth Appreciating" 7-8; Revi *et al* 2014 *Environment & Urbanization* 12; Cannon and Müller-Mahn 2010 *Nat Hazards* 621-622; UN-Habitat *Global Environment for Cities-GEO for Cities: Towards Green and Just Cities* 10; Rosenzweig *et al* "Urban Climate Change in Context" 4.

11 Nath and Behera 2011 *Environ Dev Sustain* 158-159; Addaney and Cobbinah "Climate Change, Urban Planning and Sustainable Development in Africa: The Difference Worth Appreciating" 8; Masipa 2017 *Journal of Disaster Risk Studies* 1-2; Thomas *et al* 2019 *WIREs Climate Change* 2-3; Mertz *et al* 2009 *Environmental Management* 743-744.

12 Coaffee and Lee *Urban Resilience: Planning for Risk, Crisis and Uncertainty* 5; Bulkeley *Cities and Climate Change* 4-8; UN News 2019 https://news.un.org/en/story/2019/09/1046662; UNEP date unknown https://bit.ly/3GB9MRC; Peterson "Multilevel Governance and Innovations in the Financing of Urban Climate Change Strategies" 283.

13 Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 41; De Graaf-van Dinther and Ovink "The Five Pillars of Climate Resilience" 6.

> The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions.[14]

The concept of resilience thus relates to the inherent uncertainties, vulnerabilities, and possibilities for disaster and risk management in complex social-ecological systems (SES).[15] Urban areas (cities) are examples of such systems. Therefore, resilience is considered pivotal for city-level responses to shocks and stresses.[16]

Resilience in the city context (urban resilience) is defined as:

> The degree to which cities are able to tolerate alteration before reorganising around a new set of structures and processes… [and] how well a city can simultaneously balance ecosystem and human functions.[17]

This definition illustrates that city systems will remain in or revert to a specific state until they can no longer balance their different functions. Resilient cities will then be able to adapt to deal with and accommodate the stresses or shocks experienced.[18] The capacity to manage and subsequently revert to a previous state or adapt to shocks and stresses is critical for cities, especially considering the gravity of the challenges and uncertainties they experience in the face of climate change.[19]

Urban climate resilience is not (yet) succinctly defined in academic literature. Many definitions are based on conceptualisations of resilience as used in ecology and disaster risk management and have been adapted to the context of climate-related

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14 IPCC "Annex II: Glossary of Terms" 563. See also Tyler and Moench 2012 *Climate and Development* 312.

15 Rijke *et al* "Removing Challenges for Building Resilience with Support of the Circular Economy" 110; Sharifi and Yamagata "Resilience-oriented Urban Planning" 5-7; Friend and Moench 2013 *Urban Climate* 102.

16 De Graaf-van Dinther and Ovink "The Five Pillars of Climate Resilience" 6; Griffin *et al* "Environmental Justice and Resilience in the Urban Global South: An Emerging Agenda" 3.

17 Barnett and Bai *Urban Resilience Research Prospectus* 8.

18 This alludes to the characteristics that are common in urban resilience literature, i.e., adaptability or adaptive capacity, flexibility, robustness, redundancy, diversity, equity, decentralisation, and predictability of failure ("safe-to-fail" strategies). See Kuhlicke, Kabish and Rink "Urban resilience and urban sustainability" 18-20; Arup and the Rockefeller Foundation 2018 https://www.cityresilienceindex.org/#/; The Rockefeller Foundation and Arup *City Resilience Framework* 5.

19 De Melo Cartaxo *From Environmental Rights to Resilience Justice: How Public Law can Face Social-Ecological Uncertainty in Cities* 26; Van Niekerk "Disaster Risk Reduction and Climate Change Adaptation and Resilience" 23-12. See also para 1.1 above.

stressors or shocks.[20] However, a few scholars have suggested specific definitions for urban climate resilience. To formulate a workable definition for urban climate resilience, Brown, Dayal and Rumbaitis Del Rio,[21] for example, start with a foundational definition of climate resilience as:

> The capacity of an individual, community or institution to dynamically and effectively respond to shifting climate circumstances while continuing to function at an acceptable level [and] includes the ability to resist or withstand impacts, … recover and re-organize in order to establish the necessary functionality to prevent catastrophic failure at a minimum and … to thrive at best. [It] is thus a spectrum, ranging from avoidance of breakdown to a state where transformational change is possible.[22]

In this definition, the authors deal with the shifting climate circumstances and the capacity of individuals, communities, and institutions (all of which are critical parts of cities) to deal with climate change. They go further in applying this definition to the urban context. They argue that this consideration and application to the urban context is necessary, based on the interdependencies and interconnections between urban growth, land, development, population and urban density, and what this means for risk and vulnerability in building urban capacity to deal with uncertainty and unpredictability in an evolving context.[23]

Similar to Brown, Dayal and Del Rio's definition above, Henstra[24] describes a climate-resilient city as one which is able to withstand shocks and stresses related to climate change and effectively respond to and recover from climate disasters.[25] This elucidates that city governments[26] can strengthen resilience through direct action.[27] Direct action includes, for example, using funds to adjust the vulnerability of

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20 Asian Development Bank *Urban Climate Change Resilience* 1; UN date unknown https://www.un.org/en/academic-impact/urban-resilience-changing-climate; UN Global Climate Action *Climate Action Pathway: Climate Resilience Executive Summary* 3.

21 Brown, Dayal and Rumbaitis Del Rio 2012 *Environment & Urbanization* 533-534.

22 See Henstra 2012 *Journal of Comparative Policy Analysis* 178; Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 41.

23 See Brown, Dayal and Rumbaitis Del Rio 2012 *Environment & Urbanization* 534.

24 Henstra 2012 *Journal of Comparative Policy Analysis* 178.

25 See Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 41.

26 City governments denote the local level of government. City governments, city-level authority, local government, local authority, and local-level authority are used interchangeably in this thesis.

27 Henstra 2012 *Journal of Comparative Policy Analysis* 178.

infrastructure, adapting land-use planning, and adopting, implementing, and enforcing by-laws and regulations to, *inter alia*, prevent hazardous development.[28]

1.2.2 Legal dimensions of urban climate resilience

The literature points to a range of methods and actions that are necessary to strengthen urban climate resilience.[29] Supported by the notion of direct action mentioned above, one may argue that one of the possible methods for strengthening urban climate resilience is a law and policy basis for decision-making and planning, along with the regulation of specific areas.[30] These areas should ideally fall within the scope of local or sub-national government's[31] regulatory (governing) power as it pertains to urban areas' climate resilience. These areas would include, for example, the protection of urban ecosystems and the services they offer; municipal public transportation;[32] water use and sanitation;[33] electricity reticulation;[34] management and regulation of the built environment; and land-use planning and management,[35] as well as disaster risk management.[36]

Since urban climate resilience remains an evolving concept and has not yet enjoyed definitive conceptual attention, many international, African regional, and South African national soft law and legal instruments and policies have the potential to indirectly be relevant for considerations of climate resilience if a broad interpretation and application of these instruments is adopted. This is because some of the

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28 Henstra 2012 *Journal of Comparative Policy Analysis* 178-179.

29 Prairie Climate Centre 2021 https://prairieclimatecentre.ca/publications/; McCullough *Building a Climate-Resilient City: Economics and Finance* 1-11; Morrow "Of Human Responsibility: Considering the Human/Environment Relationship and Ecosystems in the Anthropocene" 277; Suarez and Dempsey "Ecosystem Services" 177.

30 The Rockefeller Foundation and Arup *City Resilience Framework* 7.

31 The terms local government, sub-national government, municipalities, and cities will be used interchangeably in this study. Furthermore, "local government" is often used synonymously with "municipalities" in the South African context.

32 Schedule 5B of the *Constitution of the Republic of South Africa*, 1996 (Constitution).

33 As part of their municipal service delivery mandate in terms of s 152(2) of the Constitution.

34 See Schedule 4B of the Constitution.

35 See Schedules 4B and 5B of the Constitution.

36 As far as it can most effectively be administered by local government and it has the necessary capacity, or it is incidental to the effective performance of its municipal functions – see s 156(4) and (5) of the Constitution. See also Prairie Climate Centre 2021 https://prairieclimatecentre.ca/publications/.

vagaries and broad conceptualisations in these instruments can be utilised for the promotion and achievement of urban climate resilience, even if they do not explicitly provide for it.[37] In instances where these instruments do not exist or are not suitable for interpretation, legislatures have the opportunity to fill such *lacunae* by drafting applicable legislation for the purposes of enhancing and promoting urban climate resilience.

1.2.2.1 Urban climate resilience in the international law and policy context

In international law, several conventions, treaties, guidelines, and soft law instruments aim to foster urban climate resilience, albeit indirectly, and acknowledge the role of cities, in particular, as actors in climate governance. Examples include the *United Nations Framework Convention on Climate Change* (1992) (UNFCCC);[38] the *Paris Agreement* (2015);[39] the *Sendai Framework* (2015),[40] and *Transforming Our World: the 2030 Agenda for Sustainable Development* (Agenda 2030) and the Sustainable Development Goals (SDGs) it provides for;[41] among others.[42] SDG 11 is particularly important to this study as it promotes safe, inclusive, sustainable, and, most importantly, resilient cities. SDG 11 and its underlying targets are also framed in a way that connects it to several of the other SDGs, such as Goals 3,[43] 9,[44] 13,[45] and 6,[46] all of which are relevant to climate action

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37 See para 2 below.

38 *United Nations Framework Convention on Climate Change* 31 ILM 849 (1992) (UNFCCC).

39 See articles 2(b), 7(1), and 10(1) of the *Paris Agreement*.

40 United Nations General Assembly (UNGA) *Sendai Framework for Disaster Risk Reduction* 2015-2030 A/RES/69/283 (2015).

41 UNGA *Transforming Our World: The 2030 Agenda for Sustainable Development* UN Doc A/RES/70/1 (2015) (Agenda 2030).

42 Other international instruments include the UN *New Urban Agenda 2017* (2016) (NUA), the *Kyoto Protocol to the United Nations Framework Convention on Climate Change* (adopted 11 December 1997, entered into force 6 February 2005) FCCC/CP/1997/L.7/Add.1; *Report of the World Commission on Environment and Development: Our Common Future* A/42/427 (1987) (Brundtland Report); UN *Agenda 21: Programme of Action for Sustainable Development* A/CONF.151/26/Rev.1 (1992); UN *Rio Declaration on Environment and Development* 31 ILM 874 (1992).

43 Ensuring healthy lives and promoting well-being for all – Goal 3 of Agenda 2030.

44 Building resilient infrastructure, promoting inclusive and sustainable industrialisation, and fostering innovation – Goal 9 of Agenda 2030.

45 Taking urgent action to combat climate change and its impacts – Goal 13 of Agenda 2030.

46 Ensure availability and sustainable management of water and sanitation for all – Goal 6 of Agenda 2030.

and resilience of the different components of a community and city as will be evident from the discussion in Chapter two. Furthermore, many of the SDGs, speaking to infrastructure, institutions, the rule of law, and governance,[47] also resonate with the achievement of urban (climate) resilience.[48]

1.2.2.2 Urban climate resilience in the African regional law and policy context

The African regional law and policy framework relating to climate change and climate resilience includes guidelines and framework documents reflecting and attempting to address climate change and enhance city, economy and community climate resilience.[49] Examples include, *inter alia*, the *Agreement for the Establishment of the African Risk Capacity (ARC) Agency* (2012),[50] the *Africa Adaptation Initiative* (AAI)(2016),[51] and the works of the African Climate Policy Centre (ACPC) and the United Nations Economic Commission for Africa (UNECA).[52] There are also other initiatives, such as the Africa Climate Change Fund established by the African Development Bank, to foster the drive for climate resilience in Africa[53]

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47 Goal 16 of Agenda 2030.

48 Wardekker 2021 *Sustainable Cities and Societies* 10.

49 This includes, for example, UN *A Harmonized Implementation Framework for the New Urban Agenda in Africa* 14 - that has "fostering environmental sustainability and enhancing resilience and risk reduction" as one of its transformative outcomes; Trewin *et al State of the Climate in Africa* 2019; African Union Commission *Agenda 2063: The Africa We Want* (2015) 3.

50 African Union (AU) *Agreement for the Establishment of the African Risk Capacity (ARC) Agency* (2012).

51 AU *Revised African Convention on the Conservation of Nature and Natural Resources* (2017). See Sithole *A Legal and Policy Framework for Addressing Climate Change in the Western Cape Province, South Africa* 13-16.

52 See, for example, ClimDev-Africa *Intended Nationally Determined Contributions (INDC): Instruments to Reduce Emissions and Adapt to Climate Change*; ClimDev-Africa *Climate Research for Development in Africa (CR4D)*; ACPC *Climate Research for Development (CR4D) Report of the Regional Climate Research Partnership (RCRP) Workshop for Southern Africa (SA)*; Economic Commission for Africa (ECA) *Africa's Blue Economy: A Policy Handbook*; UNECA *Greening Africa's Industrialization*; ClimDev-Africa *Annual Report 2016*; ACPC *Programme Strategy: Knowledge Generation and Delivery for Climate Resilient Development Policies in Africa 2017-2021*; UNECA *Climate Research for Development in Africa Programme strategy (2019–2023)*.

53 African Development Bank Group 2023 https://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/africa-climate-change-fund.

and the Africa Adaptation Acceleration Program, which aims to transform African infrastructure and climate resilience.[54]

1.3 The law and policy framework for urban climate resilience in South Africa

South Africa is a party and signatory to many of the international and regional treaties and conventions set out above.[55] In accordance with these commitments, South Africa has promulgated legislation and adopted policies concerning climate change and its effects, environmental protection, emissions reduction, and the improvement of climate resilience, which are relevant to all spheres of government, including the local government level.[56]

South Africa's dedicated policy framework notably includes, amongst others, the *National Climate Change Response White Paper* (2011),[57] the *National Development Plan* (NDP) (2012),[58] the *National Climate Change Response Monitoring and Evaluation System Framework* (2015),[59] the *Integrated Urban Development Framework* (IUDF) (2016),[60] and the *National Climate Change Adaptation Strategy*

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54 See African Development Bank Group 2023 https://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/africa-adaptation-acceleration-program.

55 Some of these include the UNFCCC, Agenda 21, the Paris Agreement, and Agenda 2063, though this is not an exhaustive list. See Perine and Keuck *Building Urban Resilience to Climate Change: A Review of South Africa* 16.

56 The legal framework consists of, *inter alia*, the Constitution, the *National Environmental Management Act* 108 of 1998 (NEMA), sector environmental management acts (SEMAs) including the *National Environmental Management: Air Quality Act* 39 of 2004 (NEMAQA); *National Environmental Management: Biodiversity Act* 10 of 2004 (NEMBA); *National Environmental Management: Protected Areas Act* 57 of 2003; *National Environmental Management: Integrated Coastal Management Act* 24 of 2008 (NEMICMA); *National Environmental Management: Waste Act* 59 of 2008 (NEMWA); *National Water Act* 36 of 1998 (NWA); *Water Services Act* 108 of 1998; *Spatial Planning and Land Use Management Act* 16 of 2013 (SPLUMA); Minister of Forestry, Fisheries and the Environment *Climate Change Bill* (2021) (Gazette number not available); *Local Government: Municipal Systems Act* 32 of 2000 (MSA).

57 Gen Not 757 in GG 34695 of 19 October 2011 (*National Climate Change Response White Paper* – hereafter NCCRWP).

58 National Planning Commission *National Development Plan 2030: Our Future – Make it Work* (NDP).

59 Department of Forestry, Fisheries and the Environment (DFFE) (then known as the Department of Environmental Affairs (DEA)) *The National Climate Change Response Monitoring and Evaluation System Framework*.

60 Cooperative Governance and Traditional Affairs (COGTA) *Integrated Urban Development Framework* (2016).

(2019).[61] Many of these documents call for, *inter alia*, strong climate-specific policies and appropriate measures; the integration and consideration of climate change into legislation and related regulations; clear and coherent legislation and policies based on strong research and development capacity for the effective administration of resources; an effective planning system and proper implementation; the implementation of adaptation strategies; more enabling and transformative legal and policy frameworks; and the development of plans and implementation strategies at the local government level.[62]

In addition to the objectives and interventions envisaged in the above policies, the legal framework is rich in provisions that can be construed as relevant to climate resilience.[63] The need to foster climate resilience at a national level is a necessary response to climate change and deal with the effects thereof on city infrastructure and developmental issues (such as housing, environment, disaster management, water and sanitation, and other municipal service delivery mandates, as mentioned above), along with municipal planning and decision-making.[64] Climate resilience in cities should, therefore, not only be manifested in relation to environmental impacts caused by climate change but also take into account land-use planning, urban development, and socio-economic challenges. Arguably, local governments' regulation of these areas can contribute to urban climate resilience.[65] It is, therefore, firstly necessary to consider how law contributes to urban climate resilience and then to analyse the role and legislative authority of local governments in pursuance thereof.

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61 DFFE *National Climate Change Adaptation Strategy* (2019) (NCCAS).

62 See, for example, DFFE *South Africa's 2nd Annual Climate Change Report* 37; NDP 210-213; NCCRWP 6; DFFE NCCAS 49-53.

63 Du Plessis and Kotzé 2014 *Journal of African Law* 154; Du Plessis "Climate Governance in South African Municipalities: Opportunities and Obstacles for Local Government" 372.

64 Van Niekerk "Disaster Risk Reduction and Climate Change Adaptation and Resilience" 23-10; Du Plessis and Kotzé 2014 *Journal of African Law* 150; Du Plessis, Steyn and Rantlo 2023 *Transnational Environmental Law* 580; De Visser and Du Plessis "Climate Governance and Federalism in South Africa" 242; Rumble "Climate Change Legislative Development on the African Continent" 35.

65 Du Plessis and Kotzé 2014 *Journal of African Law* 150-152.

The law, and urban law, in particular, is an important mechanism for promoting urban resilience in the face of climate change.[66] Legislation, as one source of law, is usually considered to be rigid and inflexible and aimed at fostering stability and predictability, emulating the rule of law.[67] At first glance, these qualities conflict with the idea of adaptability as required for resilience.[68] Nonetheless, the law is one of the necessary tools for securing justice, legitimacy, transparency, accountability, inclusiveness, fairness, integration, capability, and adaptability.[69] Despite critique of the perceived rigidity of the law, it has an important role to play in climate change responses and fostering urban climate resilience. Arnold and Gunderson[70] advocate the use of what they term "adaptive law"[71] to make the law applied in climate resilience and adaptation better suited to the dynamics and non-linear transformations of ecological and social systems. Arguably, law and policy frameworks could and should articulate and support legal principles and values, including the rule of law, legal certainty, and procedural fairness, which might influence resilience.[72] Furthermore, the environmental, climate change, planning, and urban law and policy bases are multi-layered and exist at an international, regional, national, and sub-national level, as briefly indicated above.[73]

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66 Wenta, McDonald and McGee 2019 *Transnational Environmental Law* 90; Segger "The Role of Law and Governance in Helping or Hindering Climate Action".

67 Green *et al* 2015 *Front Ecol Environ* 333; Ebbesson 2010 *Global Environmental Change* 415-416; Garmestani, Allen and Benson 2013 *Ecology and Society* 1.

68 Cosens *et al* 2017 *Ecology and Society* 1.

69 Cosens *et al* 2017 *Ecology and Society* 3.

70 Arnold and Gunderson 2013 *Environmental Law Reporter* 10427-10428; Arnold and de Melo Cartaxo "Resilience Justice and Adaptive Law in European Cities" 129.

71 "Adaptive law" refers to the idea that environmental law, for example, needs to be better suited to changing ecological and social systems, through "overarching systemic principles that maintain the resilience and adaptive capacity of [these] systems". See Arnold and Gunderson 2013 *Environmental Law Reporter* 10426. Adaptive law, therefore, denotes a jurisprudential approach to (re-)structuring legal systems, institutions and instruments (or, as used later in this study, the agents and institutions) that are specifically oriented toward enabling flexibility, resilience, responsiveness, and adaptive capacity in the governance of complex and evolving social-ecological systems and must themselves be inherently resilient and have adaptive capacity. See Ruhl, Cosens and Soininen "Resilience of Legal Systems" 510, 517-521. Adaptive law can arguably be achieved through, for example, polycentric structures, integrated goals, flexible decision-making, and mechanisms for feedback, learning, and accountability. See Van der Berg and Pieterse 2024 *Utrecht Law Review* 4.

72 Wenta, McDonald and McGee 2019 *Transnational Environmental Law* 98.

73 See para 1.2.2 above.

1.4 Local government involved with urban climate resilience

1.4.1 Overview of local government involvement

City authorities have gained influence as role players in the international climate change law discourse as their development and activities impact the pursuit of sustainable development and fostering a climate-resilient future.[74] The global effect of climate change and its severe impacts necessitate engagement of government at all levels, including local government, to address policy shortcomings, foster inclusive decision-making and design mitigation and adaptation strategies, and contribute to the effective implementation of such policies and strategies.[75] In some instances, there have been initiatives from city authorities and urban political leaders to take climate action through climate change policy-making, even as the international community was debating common objectives and targets to fight the persisting climate crisis.[76] Furthermore, joint commitments and transnational city networks such as 100 Resilient Cities (100RC), Local Governments for Sustainability (ICLEI), Large Cities Climate Leadership Group (C40 Cities Network), and United Cities and Local Governments (UCLG) emerged to further drive climate action and represent the interests of cities in international forums.[77] There has also been an

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74 Lin *Governing Climate Change: Global Cities and Transnational Lawmaking* 3; Corfee-Morlot *et al Cities, Climate Change and Multilevel Governance* 13; Hughes, Chu and Mason "Introduction" 2; Du Plessis "Climate Change Law and Sustainable Development" 189; Oliveira *Going to Town: City-led Domestic Climate Litigation* 14; Aust and Nijman "The emerging roles of cities in international law – introductory remarks on practice, scholarship and the Handbook" 2-7.

75 Corfee-Morlot *et al Cities, Climate Change and Multilevel Governance 24; OECD Cities and Climate Change* 172.

76 Lin *Governing Climate Change: Global Cities and Transnational Lawmaking* 2.

77 Bellinson "Connecting the Dots: The Politics of Governing Urban Climate Adaptation Innovations Through Transnational Municipal Networks" 184-189; Corfee-Morlot *et al Cities, Climate Change and Multilevel Governance* 81; Hallegatte and Corfee-Morlot 2011 *Climatic Change* 2; Lin *Governing Climate Change: Global Cities and Transnational Lawmaking* 46.

increase in city involvement in climate litigation, most notably in the United States of America (US),[78] France,[79] and even South Africa.[80]

Cities are prominent because of their intimate relation and proximity to communities and their needs, and they are uniquely situated to create locally tailored and targeted responses to the particular impacts experienced in their jurisdictions.[81] This is especially true in areas where local governments have relative autonomy and the legislative authority to create by-laws in response to these issues.[82] The political landscape and accountability structure of local government also differ significantly from that of national and federal governments, which means that they are, from a bottom-up perspective, required to operate differently from other spheres of government.[83] Moreover, there is a two-way relationship between national and local government in that national climate strategies cannot be implemented if there is no close collaboration with local authorities; however, the opposite is also true in that local government cannot operate in isolation from the other levels of government.[84]

Cities bear a significant responsibility to promote human resilience, meet people's basic needs, uphold and realise human rights, and promote sustainable

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78 See C40 Cities *Legal Interventions: How Cities can Drive Climate Action* 14-28; Oliveira *Going to Town: City-led Domestic Climate Litigation* 10-14; Setzer and Higham *Global Trends in Climate Change Litigation: 2024 Snapshot* 7-8, 18, 22, 31. See also *Massachusetts v Environmental Protection Agency* 549 US 497 (2007); *West Virginia v Environmental Protection Agency (EPA)* 15-1363 United States Court of Appeals (USCA) (2019); *City & County of Honolulu v Sunoco LP* SCAP-22-0000429 (2023); *City of Annapolis v BP PLC* (2021); *Anne Arundel County v BP PLC* (2021); *Connecticut v Exxon Mobil Corp* (2020); *City of Oakland v BP PLC* (2017).

79 See *Commune de Grande-Synthe v France* No 427301 of 19 November 2020, in which a French city requested the Council of State (highest French Administrative Court) to compel the administration to take further action in the fight against climate change and to "honour its reduction standards in a staggered approach over time, that is credible and achievable." The Council of State found the mitigation measures insufficient in terms of international commitments made by France – see Torre-Schaub 2023 *European Journal of Risk Regulation* 214; Oliveira *Going to Town: City-led Domestic Climate Litigation* 10-14; C40 Cities *Legal Interventions: How Cities can Drive Climate Action* 14-28.

80 *African Climate Alliance v Minister of Mineral Resources and Energy* 2022 ZAGPPHC 946; *City of Cape Town v National Energy Regulator of South Africa* 51765/17 2020 ZAGPPHC 800.

81 Shirlow "The Role of International Law in Enhancing Urban Climate Resilience"21.

82 See Lin *Governing Climate Change: Global Cities and Transnational Lawmaking* 16.

83 Peters and Pierre 2001 *The Policy Press* 131; De Visser and Du Plessis "Climate Governance and Federalism in South Africa" 249.

84 OECD *Cities and Climate Change* 171; Corfee-Morlot *et al Cities, Climate Change and Multilevel Governance* 25.

development.[85] However, the provision of basic services depends on a healthy environment with well-functioning ecosystems. This builds on the so-called "SES approach",[86] emphasising that socio-economic interests and people are part of the environment and biosphere. It also creates links between the concepts in that economies depend on societies that rely on the biosphere, all of which depend on governance.[87] There are several conventions, treaties, guidelines, and soft law instruments aimed at fostering urban climate resilience, albeit indirectly, and that acknowledge the role of cities, in particular, as actors in climate governance.[88] Some cities have also implemented international soft-law approaches and instruments where their national governments have refrained from doing so.[89] Additionally, many city governments have also ratified local policies, strategies and plans to address the challenges and risks that they may face.[90]

1.4.2 Local government involvement in South Africa

In South Africa, the role and the authority of local government in contributing to urban climate resilience are implicitly carved out in the Constitution and local government and climate change legislation.[91] Importantly, the Constitution establishes local government as one of the distinctive, interdependent, and interrelated spheres of government.[92] Furthermore, the Constitution provides for

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85 Du Plessis and Nel "Introduction" 1-4.

86 The SES approach is considered a theoretical framework that entails the thorough consideration and understanding of the relationships, interlinkages, interactions and dynamics between complex ecological systems, the way they function, the services they deliver, and how they are integrated with human systems and activities and the social and economic impacts of such activities. In the context of this study, it relates specifically to how these interactions affect the overall resilience to climate change in cities, specifically. See Adger, Brown and Waters "Resilience" 697; Virapongse *et al* 2016 *Journal of Environmental Management* 85.

87 These links are further explored in paras 2.2.4 and 2.3 below.

88 See para 1.3 above.

89 Lin *Governing Climate Change: Global Cities and Transnational Lawmaking* 46.

90 Lin *Governing Climate Change: Global Cities and Transnational Lawmaking* 46; C40 *Nationally Determined Contributions Ambition Handbook: Learning from City Success to Raise National Ambition* 2; C40, Global Covenant of Mayors for Climate and Energy, and Urban Climate Change Research Network (UCCRN) *The Future We Don't Want* 5; UNDRR *Global Assessment Report (GAR) on Disaster Risk Reduction* 387; Ziervogel 2022 https://www.un.org/africarenewal/magazine/september-2022/african-cities-climate-action-plans-could-help-address-injustice-inequity.

91 Chapter 7 of the Constitution; s 11 of the MSA; ss 3(f), 4(2), and 7(1) of the *Climate Change Act* 22 of 2024, in particular.

92 Section 40(1) of the Constitution.

semi-autonomous local governments and affords each of them the right to "govern, on its own initiative, the local government affairs of its community, subject to national and provincial legislation" that is constitutionally compliant.[93] They are further mandated to exercise their executive and legislative authority pertaining to functional matters listed in Schedules 4B and 5B of the Constitution.[94] Among the functions ascribed to local governments in the Schedules are air pollution, building regulations, municipal planning, municipal public works related to the needs of municipalities in the discharge of their responsibilities to administer functions specifically assigned to them, potable water supply, electricity reticulation, and stormwater management systems in built-up areas, for example.[95] By regulating these areas and addressing the impact of climate change on them, municipalities stand to improve climate resilience in their areas.

Furthermore, local governments also have a duty to ensure the promotion of a safe and healthy environment and sustainable service delivery within their financial and administrative capacities.[96] This duty is apparent from section 24 of the Constitution, which imposes an environmental protection mandate on all three spheres of government, including local government. This duty is further reinforced by section 152(1)(d) of the Constitution, stating that one of the objects of local government is to promote a safe and healthy environment.[97] It can be argued that this duty can also extend to the promotion and realisation of climate resilience. Section 24 of the Constitution provides for a right to an environment not harmful to human health and well-being[98] and holds that the environment ought to be protected, not only for current but also for future generations.[99] It further allows for reasonable legislative and other measures to be taken by all spheres of government to effect the prevention of pollution and ecological degradation, encourage conservation, and ensure ecologically sustainable development and natural resource use without

93 Section 151(3) of the Constitution.
94 See s 156(1)(a) and Schedules 4B and 5B of the Constitution.
95 Schedules 4B and 5B of the Constitution.
96 Section 152(1) of the Constitution.
97 Section 152(1)(d) of the Constitution.
98 Section 24(a) of the Constitution.
99 Section 24(b) of the Constitution.

impeding justifiable economic and social development.[100] Furthermore, in the context of responding to climate change, Du Plessis and Kotzé[101] say that:

> municipalities [therefore] have a very explicit constitutional mandate to respond to climate change challenges insofar as they impact on or may impact in future on the local interests protected and guaranteed by the environmental right.

This sentiment is also echoed by Du Plessis, Steyn and Rantlo,[102] who hold that city governments, due to their proximity to constituents and direct exposure to challenges, are more likely to "push the boundaries of their competence" to respond to global contemporary challenges such as climate change and migration, among others.[103]

The law and policy framework can, therefore, potentially contribute to climate resilience by providing for certain regulatory and other measures that address climate change, directly or indirectly.[104] This follows from the fact that these laws and policies form the basis for the management of the environment and related issues at all levels of government.[105] Yet, there is no distinguished centralised legal and policy framework for specific, unitary and locally relevant climate action, despite the urgency surrounding climate change and its related difficulties.[106] The *lacuna* created by the lack of a unitary legislative and policy framework results in fragmentation, governmental silos, and malalignment of national and local government relations, disrupting the implementation of cooperative governance.[107]

In addition to the above, section 156(4) of the Constitution establishes the authority of local government through the principle of subsidiarity and enhances local government autonomy. Section 156(5) refers to the incidental powers of

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100 Section 24(b)(a)-(c) of the Constitution.

101 Du Plessis and Kotzé 2014 *Journal of African Law* 154. See also De Visser and Du Plessis "Climate Governance and Federalism in South Africa" 243.

102 Du Plessis, Steyn and Rantlo 2023 *Transnational Environmental Law* 570-571.

103 Du Plessis, Steyn and Rantlo 2023 *Transnational Environmental Law* 570-571.

104 Du Plessis "Climate Governance in South African Municipalities: Opportunities and Obstacles for Local Government" 373; Du Plessis and Kotzé 2014 *Journal of African Law* 162.

105 Du Plessis "Climate Governance in South African Municipalities: Opportunities and Obstacles for Local Government" 373.

106 De Visser and Du Plessis "Climate Governance and Federalism in South Africa" 241.

107 De Visser and Du Plessis "Climate Governance and Federalism in South Africa" 246. See also s 41 of the Constitution, and s 5 of the *Intergovernmental Relations Framework Act* 13 of 2005.

municipalities and alludes to the autonomy of municipalities. The former section allows for the administration of matters relating to local government if they would most effectively be dealt with at a municipal level and if the municipality in question has the required capacity to administer them.[108] The latter subsection ascribes power to local governments over matters that are reasonably necessary for, or incidental to, a municipality's effective performance of its duties and functions.[109] The executive and legislative competence of municipalities manifests through certain measures such as the drafting of by-laws and local policies, plans, programmes, and initiatives that they undertake or adopt.[110] Municipalities are also generally considered to have leeway in exercising their executive and legislative competence and may use these measures innovatively. These measures include, among others, local environmental governance instruments, which may comprise instruments for innovative regulation of changing circumstances[111] and can take the form of, among others, plans, policies, agreements, partnerships, and public participation.[112]

Section 156(2) of the Constitution, specifically, authorises municipalities to draft and adopt by-laws pertaining to matters that they have the power to administer, provided that they are in line with the Constitution and national or provincial legislation.[113] By-laws empower municipalities to regulate specific functional areas in order to control the conduct and behaviour of constituents in sectors for which municipalities are responsible.[114] This illustrates that local government has the authority to develop and adopt by-laws in order to strengthen urban climate resilience. In addition, by-laws can be used to complement or strengthen other

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108 Section 156(4) of the Constitution. This authority of local government is, however, dependent on the assignment of the administration of such matters listed in Schedules 4A and 5A.

109 Section 156(5) of the Constitution. See also Du Plessis 2015 *CILSA* 296-301.

110 Section 11 of the MSA; Du Plessis and Nel "Introduction" 1-34.

111 See s 11(3)(n) of the MSA. See also Du Plessis and Nel "Introduction" 1-35.

112 See Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-4 – 3-5.

113 See s 156(3) of the Constitution.

114 Wessels "Environmental By-laws – The Missing Link of Integrated Environmental Management" 19.

national, provincial and local governance instruments.[115] However, it must be noted that the by-laws may not go beyond the scope of local government's mandate. In planning law, these mandates are not always as clear as they ought to be and a local government might overstep the boundaries of their mandates by regulating something in their by-laws they consider to fall within the scope of their power, while they are actually usurping the function and duties of another sphere, such as in the case of *Govan Mbeki Local Municipality v Glencore Operations South Africa (Pty) Ltd; Emalahleni Local Municipality v Glencore Operations South Africa (Pty) Ltd*.[116]

Additionally, the national legal framework also encompasses the SPLUMA, which has spatial resilience as one of its principles.[117] The SPLUMA provides municipalities with the power to regulate and control land within their jurisdiction through strategic and spatial planning.[118] The SPLUMA also requires local governments to draft certain spatial planning instruments and "regulatory mechanisms" such as integrated development plans (IDPs), spatial development frameworks (SDFs), and land-use schemes (LUSs) that are crucial to the construction of the spatial form of cities.[119] Spatial planning and land use management encompass some of the sectoral functions of planning, such as *inter alia*, transport, the built environment, environmental protection and conservation, infrastructure development, and density and development in the city.[120]

Climate change undoubtedly poses a great risk to South African cities,[121] as alluded to above, and will have long-lasting and, in many instances, unpredictable effects,

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115 Wessels "Environmental By-laws – The Missing Link of Integrated Environmental Management" 19.

116 2024 ZACC 25 paras 48-94.

117 Section 7(d) of the SPLUMA.

118 Section 5(1)(c) of the SPLUMA. See also Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 11.

119 See s 6(1)(b) of the SPLUMA; Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 11.

120 See Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 128-129.

121 Ziervogel *et al* 2014 *WIREs Clim Change* 605-606; Chersich *et al* 2018 *International Journal of Environmental Research and Public Health* 2; Wright *et al* 2021 *Environmental Research* 1; Van Niekerk "Disaster Risk Reduction and Climate Change Adaptation and Resilience" 23-10.

emphasising the need for climate resilience. Some of the most recent climate-related catastrophes to have hit the country's cities include severe floods and landslides across KwaZulu-Natal and Eastern Cape,[122] floods and storms in the Western Cape,[123] earthquakes in Johannesburg,[124] and increased heatwaves and drought occurrences.[125]

Yet, it is possible that the existing legal framework in the country enables and allows municipalities to contribute to resilience in cities.[126]

1.5 The potential of by-laws as an instrument for urban climate resilience

The by-laws adopted and promulgated by local governments can, and arguably do, enhance adaptation and resilience to adverse shocks and stresses at a local scale.[127] In some instances, local government authorities have already used their legislative and executive authority to address the impacts of climate change through by-laws and local policies incidental to climate response measures.[128] Furthermore, by-laws may typically enable localised climate response measures, facilitate the implementation of municipal decisions, and provide for conditions to be imposed upon new developments.[129] Municipal by-laws may also be used to establish norms and standards for existing activities and developments, such as waste management and regulation and air quality emission standards.[130] By-laws can, for example, also provide for instruments such as plans (such as implementation plans), restrictions

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122 See Tandon 2022 https://tinyurl.com/5dwvb8b3.

123 Vecchiatto, Vollgraaff and Sguazzin 2023 https://www.bloomberg.com/news/articles/2023-09-26/climate-change-blamed-for-south-africa-s-floods.

124 Mail & Guardian 2023 https://mg.co.za/the-green-guardian/2023-06-11-johannesburg-shaken-by-5-0-earthquake/.

125 Naidoo 2023 https://theafrican.co.za/environment/drought-extreme-heat-on-the-cards-for-south-africa-the-continent-5b6313af-7c26-4892-bec3-6d007241beba/.

126 See Du Plessis 2018 *SAJELP* 21.

127 Du Plessis and Kotzé 2014 *Journal of African Law* 162. See also Du Plessis, Steyn and Rantlo 2023 *Transnational Environmental Law* 589.

128 Such incidentally relevant by-laws include, for example, Air Quality Management By-laws, Electricity Supply By-laws, and Stormwater Management By-laws, amongst others. See Du Plessis, Steyn and Rantlo 2023 *Transnational Environmental Law* 588-589.

129 Du Plessis and Kotzé 2014 *Journal of African Law* 162.

130 Du Plessis and Kotzé 2014 *Journal of African Law* 162. See, for example, s 9(3) and (5) of NEMWA and s 11 of NEMAQA.

and conditions (for approvals of development applications, for example), authorisations (such as land use authorisations), and governance or decision-making structures (such as advisory boards and the like) to be established. Despite their regulatory potential, there are some challenges which will be elaborated on in Chapter three of this study.[131]

The above discussion begs the question: how can municipal by-laws contribute to climate resilience in South African cities? To respond to this question, it is necessary to determine the role that the law plays in enhancing urban climate resilience, generally, and what issues related to urban climate resilience can reasonably be dealt with through the use of (city-level) legislation.

This study briefly considers whether climate resilience matters ought to be consolidated into a single law (by-law) or rather a collection of sector legislative instruments (by-laws). When the study turns to the examination of how by-laws can contribute to urban climate resilience in South African cities, it focuses on spatial planning and land use management by-laws (SPLUM by-laws).[132] Land use and spatial planning influence the layout of cities and how they are constructed. Furthermore, they determine, among others, the spatial location of city infrastructure, which can ensure that infrastructure is placed in areas that are low risk for climate hazards, such as floods, etc., so that it may be able to resist shocks and stresses and retain functionality.[133] Many of the sector-specific competencies of local government set out in Schedules 4B and 5B of the Constitution can also be regulated, in part, by SPLUM by-laws.[134] SPLUM by-laws can, therefore, influence the urban built environment through building regulations and regulation of municipal roads and environmental conservation through the regulation of municipal parks and public spaces, among others.[135]

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131 See para 3.5 below.

132 See Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 8.

133 Sharifi and Yamagata "Resilience-Oriented Urban Planning" 4-6.

134 Such as municipal parks and recreation, municipal roads, public spaces, building regulations, and municipal public transport, for example.

135 See Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 9.

1.6 SPLUM by-laws in the spotlight

This study specifically aims to determine the *status quo* of SPLUM by-laws in three secondary cities, namely: Emfuleni Local Municipality (Emfuleni) in the Sedibeng District municipal area in Gauteng, Msunduzi Local Municipality (Msunduzi) in the Umgungundlovu District municipal area in KwaZulu-Natal, and Polokwane Local Municipality (Polokwane) in the Capricorn District in Limpopo. These cities are all categorised as secondary cities in the South African Cities Network (SACN) report on *Secondary Cities in South Africa: The Start of a Conversation*.[136] These cities were further selected from three different provinces to provide an overview of the use of by-laws in different geographical areas in the country. These municipalities were also chosen based on selected indicators used by SACN in the abovementioned report, such as demographics (population size and density), economic strength (GDP and economic growth or decline), income levels (income per capita), public finances (annual total revenue), and employment.[137] All three cities are classified as large and semi-diverse intermediate city municipalities (ICMs).[138] All three cities have a population exceeding 500 000 people, and house more than one per cent of the national population, and all three are inland cities.[139] Msunduzi and Emfuleni are also classified as among the top ten most densely populated cities in South Africa, with Polokwane in the top 15.[140] All three cities fall within the top ten largest city economies in the country.[141]

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136 SACN *Secondary Cities in South Africa: The Start of a Conversation* 7.

137 See SACN *Secondary Cities in South Africa: The Start of a Conversation* 8; SACN *Outside the Core: Towards an Understanding of Intermediate Cities in South Africa* 24-33; SACN *Profiling Intermediate Cities in South Africa* 12; Donaldson, Marais and Nel "Secondary Cities in South Africa" 123-124.

138 SACN *Profiling Intermediate Cities in South Africa* 11.

139 See Main *The Local Government Handbook: South Africa 2021* 77,104, and 123. This research was based on data from 2016 as well as Census data from 2011.

140 This was the position in 2014 at the time of publication of SACN *Secondary Cities in South Africa: The Start of a Conversation* 36. See also the populations of these secondary cities in Main *The Local Government Handbook: South Africa 2021* 77,104, and 123 – they are among the five most populated secondary cities in South Africa (see SACN *Profiling Intermediate Cities in South Africa* 11).

141 This was the position in 2014 at the time of the publication of SACN's *Secondary Cities in South Africa: The Start of a Conversation* 37.

The focus on secondary cities in this study is motivated by the international and private-sector foci on these "intermediate cities" as they tend to have the highest population growth rate and are considered primary drivers of economic growth.[142] Secondary cities also serve to alleviate some of the pressure of urbanisation on metropolitan cities and are important catalysts for more balanced and dispersed growth and interlinkages between metropolitan and rural areas.[143] It is also contended that the majority of population growth is absorbed by smaller and medium-sized cities.[144] Furthermore, secondary cities in developing countries are considered to serve important socio-economic functions and have increased connections to the global economy.[145] They also comprise the most rapidly growing type of settlement in urban systems, despite the underdeveloped settlement hierarchy often present in developing countries, the concomitant inadequacy of service delivery in such areas and the lack of adequate infrastructure.[146] This can arguably make these types of cities more vulnerable to the risks posed by climate change, such as floods, droughts, fires and sea-level rise.[147] Secondary cities are also under-researched, not only in the South African context but globally, as urban planning and other fields of research usually focus on well-resourced metropolitan urban areas.[148]

1.7 Objectives

The main objective of the study is to critically explore how SPLUM by-laws can enhance urban climate resilience in South African secondary cities.

The ancillary aims and objectives are:

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142 SACN *Secondary Cities in South Africa: The Start of a Conversation* 6.

143 UN-Habitat *World Cities Report 2020* 14; SACN S*econdary Cities in South Africa: The Start of a Conversation* 6; Marais and Cloete 2017 *Development Southern Africa* 183-186.

144 UN-Habitat *World Cities Report 2020* 14; Andreasen *et al* 2017 *Geografisk Tidsskrift-Danish Journal of Geography* 93.

145 Donaldson, Marais and Nel "Secondary Cities in South Africa" 121.

146 Donaldson, Marais and Nel "Secondary Cities in South Africa" 121, 124.

147 See Van Huyssteen, Le Roux and Van Niekerk 2013 *Jàmbá: Journal of Disaster Risk Studies* 6; Carter *et al* 2015 *Progress in Planning* 4.

148 UN-Habitat *World Cities Report 2020* 14; Andreasen *et al* 2017 *Geografisk Tidsskrift-Danish Journal of Geography* 93; Marais and Cloete 2017 *Development Southern Africa* 183.

- To conceptualise urban climate resilience with specific reference to South African cities;

- To determine how the law may contribute to the enhancement of urban climate resilience, with specific reference to the South African urban context;

- To critically analyse the relevant law-making responsibility and authority of local government in South Africa;

- To determine the extent to which local SPLUM by-laws in the South African context can enhance urban climate resilience;

- To assess the state of the SPLUM by-laws of three of South Africa's secondary cities, namely Emfuleni, Msunduzi, and Polokwane, in relation to urban climate resilience; and

To conclude the study and propose recommendations for the promotion of urban climate resilience through the use of by-laws, and to reflect on some aspects of the research in need of further investigation.

1.8 Research methodology

This study is partially informed by literature from other disciplines such as ecology, climate science, resilience, planning, and urban studies.[149] The research also draws on publicly available information pertaining to existing local government by-laws related specifically to spatial planning and land use management.

Building on the scholarship offering a conceptual understanding of resilience and climate resilience, this study integrates and considers these notions as used in the typologies of selected scholars.[150] Subsequently, the researcher formulates a new typology to encapsulate the distinct features of what urban climate resilience entails in Chapter two of the study.[151] To do this, the researcher organises conceptual ideas

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149 See paras 2.1 - 2.4 below.
150 See para 2.2 below.
151 See paras 2.2 - 2.4 below.

and qualitative data collected to formulate a workable typology. With the literature on urban climate resilience in mind, the researcher determines, by way of this typology, a categorical understanding of urban climate resilience encompassing its generally applicable features. This categorical understanding subsumes the grouping of the general features into categories meaningful for the purposes of this study.[152] Based on the categorical understanding, the researcher subsequently determines the categorical description of urban climate resilience in South Africa, informed by the *status quo* of the country for each sphere (economic, social, environmental, and governance).[153] The researcher then postulates actionable features for urban climate resilience suitable for the South African context.[154] These South African-specific features of urban climate resilience are used to distil features that are susceptible to government regulation and legislative regulation in particular.[155] After this, the shorter list of features susceptible to legislative regulation is employed as a yardstick for determining the extent to which municipal law-making and the use of by-laws as a regulatory instrument can promote and address urban climate resilience in the South African context.[156]

The research further examines, by way of a desktop review, the national law and policy framework which provides municipalities with legislative authority.[157] The study further includes an analysis of the role of SPLUM by-laws for urban climate resilience, as the main objective of the study.[158] Furthermore, the researcher critically reviews the SPLUM by-laws of three secondary cities in South Africa, namely Emfuleni, Msunduzi, and Polokwane.[159] The contents of the SPLUM by-laws are critically analysed and considered against the features of urban climate resilience in South Africa that are identified to be susceptible to legislative

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152 See para 2.3 below.
153 See paras 2.3 and 2.4 below.
154 See para 2.4 below.
155 See para 3.4 below.
156 See para 3.3 and 3.4 below.
157 See para 3.2 and 3.3 below.
158 See paras 4.1 – 4.5 below.
159 See para 5.2 below. The rationale, scope, and justification for the focus on secondary or medium-sized cities, under which all three of the selected local municipalities are classified (and why these particular municipalities were chosen), are explained in para 1.6 above.

regulation, particularly at a local government level. For this purpose, the researcher employs a mixed research method, namely, a literature review and an empirical study.

The literature review includes both primary and secondary sources of law. Primary sources of law include, among others, legislation and policy from all spheres of government, as well as case law relating to the fields of environmental law, local government law, planning law, urban law, constitutional law, and climate change law. Secondary sources include published scholarly works (books, journals, articles, and reports) on topics relating to resilience, governance, environmental law, local government law, urban law, constitutional law, and climate change law.

The qualitative empirical research component of this study includes semi-structured interviews with participants from the department(s)[160] responsible for or involved with the drafting and implementation of SPLUM by-laws in the selected municipalities.[161] These participants include, amongst others, planning officials, administrators from the land use, spatial planning, and environmental management departments, and legal advisors involved in the development, approval, and enforcement of the specified by-laws.

The use of voluntary and open-ended semi-structured interviews furnished the researcher with different perceptions, experiences, understandings, and contextual interpretations of, *inter alia*, the role of the law and municipal by-law drafting,

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[160] These departments include, for example, Economic Development Planning and Human Settlements (Emfuleni), Disaster Risk Management (Emfuleni), Sustainable Development and City Enterprises (Msunduzi), Infrastructure Services (Msunduzi), Public Works (Emfuleni), Infrastructure and Planning (Emfuleni), Environmental Management and Planning (Emfuleni), Spatial Planning and Development (Polokwane), Strategic Planning, Monitoring and Evaluation (Polokwane), Community Services (Polokwane) and the legislative departments of municipalities. The departments have different names in different municipalities, and in some, the responsibilities of local government as proposed in this study fall into several departments.

[161] This component of the research methodology draws from the methodology developed by Van der Berg in her PhD thesis titled *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 18-21. Van der Berg's methodology and study are similar in scope to the extent that both studies consider a conceptual notion and how it would apply in the South African urban context. Furthermore, both studies consider, to some extent, the role and function of local governments, requiring the use of semi-structured interviews to elucidate perceptions, experiences, and understanding of legal requirements placed upon municipalities.

specifically, and how this may potentially promote urban climate resilience. This component of the research was necessary as it informed the practical and legally relevant manner in which municipal by-law drafting for ideals such as urban climate resilience occurs and indicated the opportunities and obstacles in the development and approval of by-laws experienced at as municipal level. It also elucidated experiences of compliance with and enforcement of by-laws, which were then extrapolated as part of the evaluation of the use of SPLUM by-laws, in particular.

Participants were selected based on their portfolio and department within the municipality and their perceived involvement with by-laws, and specifically SPLUM by-laws, as well as their knowledge of the impacts of climate change or climate resilience and their intersectionality with the planning aspects. As such, the participants included planners in the spatial planning as well as the land use departments, two of the participants were from the legal services departments, and two participants were from the environmental management departments (of the different municipalities). In the end, there were four participants in both Emfuleni and Msunduzi, and only three in Polokwane.[162] The limited number of participants stemmed from the unresponsiveness of potential participants to requests for interviews, despite having obtained the relevant permission letters from the applicable gatekeepers at the different municipalities, and notwithstanding numerous calls and email requests. Some participants who were originally contacted either indicated that they did not consider themselves to be suitable for the interviews, with some providing referrals to other "more suitable" colleagues, while others did not respond at all. This also affected the relevance of the predetermined questions, as the questions were developed and approved by the ethics committee ahead of the actual interviews.[163]

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[162] See para 5.2 below.

[163] Ethical clearance had to be obtained and approved before the researcher could reach out to the gatekeepers for permission to conduct interviews at the proposed municipalities. The questionnaire had to be adapted in some instances for participants not in the spatial planning and land use management field or departments, but the researcher tried to keep the questions as similar as possible to not retract from possible findings, while relating to and allowing participants to share their experiences and knowledge.

Semi-structured interviews, as envisioned above, were, therefore, suitable due to the open-ended nature of the questions asked. Such semi-structured interviews allowed the researcher and participants to remain focused on the matters relevant to this research, prevented them from being side-tracked, and allowed the participants to elaborate on and discuss their experiences in more depth. This encouraged extensive and insightful answers, rather than eliciting mere yes or no answers.[164] Lastly, the semi-structured interviews facilitated dialogue between the researcher and relevant participants, thereby making follow-up questions and enquiries possible in those instances where more detail, clarity, or elaboration was required.[165]

1.9 Structure of the study

Chapter two of the study defines and conceptualises the notion of urban climate resilience. This chapter aims to identify and characterise the features of urban climate resilience through analysing scholarly discourse. It then provides a typology of general features of urban climate resilience packaged into a categorical description suitable for this study.[166] The typology of the features identified from the global discourse is subsequently used to provide insight into the urban climate resilience features in the South African city context. Thereafter, the chapter explicates the features of urban climate resilience in the secondary city context.

Chapter three explores how the law may contribute to the enhancement of urban climate resilience and critically analyses the relevant law-making responsibility and authority of local government (municipalities) in South Africa.

Chapter four considers the role of local SPLUM by-laws as instruments for enhancing urban climate resilience in the South African context.

Chapter five first seeks to assess the state of the SPLUM by-laws of three of South Africa's secondary cities, namely Emfuleni, Msunduzi, and Polokwane. The chapter

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164 See para 5.3 below.
165 See para 5.3 and 5.4 below.
166 See para 1.8 above.

provides a critical assessment of these cities as case studies into the use of by-laws, specifically SPLUM by-laws, for enhancing urban climate resilience in South African cities. This chapter draws on qualitative empirical research in the form of semi-structured interviews with participants from the identified cities, as explained earlier.[167]

Finally, Chapter six concludes the study with central findings and proposes recommendations for the enhancement of urban climate resilience in South African cities through the use of by-laws based on the background, theoretical, legal, and qualitative information established in the preceding chapters. This chapter also aims to reflect on the research that remains to be done.

[167] See para 1.8 above.

CHAPTER 2 CONCEPTUALISATION OF URBAN CLIMATE RESILIENCE IN THE SOUTH AFRICAN CONTEXT

2.1 Introduction

Resilience and urban climate resilience are somewhat ambiguous notions, given that they originate and have developed from several research fields such as ecology, engineering, disaster risk management, and more.[168] The terms are also constantly evolving and being adapted in terms of what they are proposed to signify and delineate. Despite their vagueness and potential multiple meanings, these concepts are important for directing decisions, policymaking and actions towards contributing to climate resilience, generally and in an urban context.

The objective of this chapter is to conceptualise climate resilience with specific reference to the South African urban context. For this purpose, the chapter first considers the exposition of urban climate resilience as a general concept,[169] then describes how features can be distilled from the vast literature, and subsequently provides a categorical understanding of urban climate resilience based on the spherical typology discussed.[170] The categorical understanding is consequently used to offer insights into how urban climate resilience should be understood in the South African urban context, based on South Africa's urban *status quo*.[171] After this context is discussed, the researcher identifies actionable features for urban climate resilience that are suitable in the South African context.[172] The rationale for this scope was explained in Chapter one.[173] This chapter feeds into the main objective of the study by clarifying what the notion of urban climate resilience entails and ascertaining the features against which the proposed by-laws will be analysed for their potential to contribute to urban climate resilience in the identified secondary

168 See para 2.2.1 below.
169 See para 2.2 below.
170 See para 2.3 below.
171 See para 2.4 below.
172 See para 2.5 below.
173 See para 1.8 above.

cities.[174] The general features under the categorical understanding in section 2.3 of this chapter were selected by extracting the most commonly occurring features in the literature from the research fields mentioned above and grouping them into spheres as relevant.[175] The general features were then adapted for the present South African context.

2.2 Conceptualising urban climate resilience

2.2.1 Resilience

The vast literature and plurality of meanings of resilience can be overwhelming and cause uncertainty, especially if one considers them in the climate change, urban, law, and spatial planning and land use management contexts. This is especially true when considering other nuanced and complex notions and sectors that are closely related to the concept of resilience. As alluded to earlier, the notion of resilience is not unique and is limited to its popular use in climate change, disaster risk and SES studies discourse.[176] It has also been used widely in other disciplines, including engineering, psychology, physics, economics, information technology, and subsequently in ecology and planning.[177]

The term "resilience" denotes a threshold that, when breached, renders the system vulnerable to risk and failure.[178] In Annexure I to the *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*, the authors define resilience as:

> The capacity of interconnected social, economic and ecological systems to cope with a hazardous event, trend or disturbance, responding or reorganising in ways that maintain their essential function, identity and structure.[179]

This definition supports the definition of resilience above[180] and confirms that the concept of resilience relates to the inherent uncertainties and vulnerabilities in

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174 See para 1.7 above.
175 See para 1.8 above.
176 Pelling *Adaptation to Climate Change* 90. See also para 2.1 above.
177 Sharifi and Yamagata "Resilience-Oriented Urban Planning" 3-4.
178 Pelling *Adaptation to Climate Change* 91. See also para 2.2.3 below.
179 IPCC "Annex I: Glossary" 696.
180 See para 1.2 above.

complex SES, such as cities.[181] In many instances, proposed definitions encapsulate the ability of a system to absorb, adapt to, self-organise, resist, accommodate, recover from, resile from, and "bounce back" from shocks and stresses such as hazards and disastrous events.[182] Furthermore, many of the definitions also refer to a system retaining and recovering its basic function, structure, and integrity.[183]

As briefly alluded to in Chapter one,[184] resilience is thus, in many instances, considered to be a characteristic of a system or structure when it returns to a state of stability after disturbance.[185] It is this state of stability to which a system returns that Holling[186] refers to as engineering (or equilibrium) resilience.[187] Holling, known for coining the term "resilience" in the context of ecology, differentiates between "equilibrium (or engineering) resilience" and "non-equilibrium (or ecological) resilience".[188] Engineering resilience determines that a system will "bounce back" to a former state of equilibrium, i.e., what it was prior to the disturbance, whereas ecological resilience is rather the ability of the system to absorb shocks and stresses for it to continue to function without necessarily remaining the same.[189] It is further suggested that resilience consists of certain properties, including *inter alia* recovery, resistance, and persistence.[190] The literature also makes a further distinction between "specific" versus "general resilience".[191] Specific resilience pertains to the

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181 Rijke *et al* "Removing Challenges for Building Resilience with Support of the Circular Economy" 110; Sharifi and Yamagata "Resilience-oriented Urban Planning" 5-7; Friend and Moench 2013 *Urban Climate* 102.

182 Surjan, Sharma and Shaw "Understanding Urban Resilience" 19; UNDRR 2020 https://www.undrr.org/terminology/resilience; Lavell *et al* "Climate Change: New Dimensions in Disaster Risk, Exposure, Vulnerability, and Resilience" 34.

183 Walker *et al* 2004 *Ecology and Society* 2; Resilience Alliance 2022 https://www.resalliance.org/resilience; Lavell *et al* "Climate Change: New Dimensions in Disaster Risk, Exposure, Vulnerability, and Resilience" 34; Dakos and Kéfi 2022 *Environmental Research Letters* 1-2.

184 See para 1.2 above.

185 Surjan, Sharma and Shaw "Understanding Urban Resilience" 17.

186 Holling 1973 *Annual Review of Ecology and Systematics* 2.

187 See para 1.2 above.

188 Holling 1973 *Annual Review of Ecology and Systematics* 14-18; Holling "Engineering Resilience versus Ecological Resilience" 32-33; Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 40.

189 Holling "Engineering Resilience versus Ecological Resilience" 32-33; Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 40.

190 Kuhlicke, Kabish and Rink "Urban Resilience and Urban Sustainability" 17-18.

191 Thorén "Against general resilience" 26; Walker and Salt Resilience *Thinking: Sustaining Ecosystems and People in a Changing World* 121.

ability to withstand and absorb a specific disturbance, while general resilience relates to the capability to withstand and absorb calamitous events in general, also when they are unforeseen.[192]

In the literature, engineering resilience is questioned due to observations that the previous state of a system might not be suitable to return to, and a system reverting back to an unfavourable state may render it as vulnerable and at risk as before the disruption.[193] Furthermore, it is argued that SES are constantly changing and fluctuating and are not likely to have a constant state to which they can return.[194] In line with this idea, ecological resilience is preferred in the discourse as it allows for the changing nature of SES and supports the idea of "bouncing forward" as contrasted against engineering resilience's "bouncing back".[195] It is argued that ecological resilience denotes the ability of SES to resist change until it can no longer do so and then move into a new state.[196] Nevertheless, current conceptions of ecological resilience are not considered completely encompassing what resilience ought to be.[197] It is argued that there is also what is termed socio-ecological or evolutionary resilience, which revolves around the idea that SES, as complex systems, are constantly changing, and as such, they do not possess an equilibrium state to which the system can revert or move on to.[198]

There is a move towards what is termed "adaptive resilience", which occurs when a city system does not revert back to a previous state of equilibrium but rather adapts to the changing circumstances along with the shocks and stresses.[199] Notably, the definition above has also been extended to provide for resilience as a positive attribute "when a system maintains capacity for adaptation, learning and

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192 Thorén "Against general resilience" 26. See also Walker and Salt *Resilience Thinking: Sustaining Ecosystems and People in a Changing World* 121.

193 Folke *et al* 2010 *Ecology and Society* 3; Coaffee and Lee *Urban Resilience: Planning for Risk, Crisis and Uncertainty* 19-26.

194 Holling 1973 *Annual Review of Ecology and Systematics* 1-2.

195 Sharifi and Yamagata "Resilience-Oriented Urban Planning" 6.

196 Holling 1973 *Annual Review of Ecology and Systematics* 14. See also Dakos and Kéfi 2022 *Environmental Research Letters* 1.

197 Kuhlicke, Kabish and Rink "Urban Resilience and Urban Sustainability" 18-22; Suárez, Gómez-Baggethun and Onaindia "Assessing Socio-ecological Resilience in Cities" 199.

198 Suárez, Gómez-Baggethun and Onaindia "Assessing Socio-ecological Resilience in Cities" 199.

199 Turok 2014 *Environment and Planning A* 752.

transformation."[200] This is often referred to as adaptive and transformation capacity. Many scholars subsequently argue for transformational resilience, in which systems have the ability to adapt to, transform, and create "fundamentally new" systems when the present system becomes untenable due to external shocks and stresses.[201]

There is no universally applicable, established definition of resilience; this also becomes apparent from the discourse regarding resilience, as it is a term so widely used across disciplines, each with its own specific contextualisation and differentiating subject matter. In the literature, some scholars consider adaptive and transformative capacity as one and the same thing relating to resilience,[202] while others argue that these are two different concepts.[203] There are also those who argue that adaptation, transformation, and resilience are different notions altogether, yet they are often used interchangeably.[204]

Resilience has become so widely used that many of the definitions proposed relate to more than just "pure" resilience, making the meaning of the term even more nuanced. Many of the suggested variations are already coloured by other contexts, among which "city", "urban"-, "system"-, and "climate change"-resilience. This necessitates a brief discussion on the nuances that exist in resilience discourse within the various contexts, specifically related to climate resilience and urban climate resilience as it interacts with risk and vulnerability.

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200 IPCC AR6 9. See also Abeling *et al* "Resilience – A Useful Approach for Climate Adaptation?" 462.

201 Normandin *et al* "The Definition of Urban Resilience: A Transformative Path towards Collaborative Urban Risk Governance" 11; Walker *et al* 2004 *Ecology and Society* 2. However, there are also incongruities between what is construed as resilience, adaptation and transformation, respectively, as they are seen as differing in the amount of change they allow in urban transformation. See Kuhlicke, Krellenberg and Welz "Resilience, Adaptation and Transformation: Conceptual and Empirical Insights" 316-317.

202 See Griffin *et al* "Environmental Justice and Resilience in the Urban Global South" 3-4, 6; Linkov and Palma-Oliveira "An Introduction to Resilience for Critical Infrastructures" 10; Sansavini "Engineering Resilience in Critical Infrastructures" 190; Thorén "Against General Resilience" 27; Silvast "Energy Dimension of Urban Resilience" 307.

203 See De Graaf-van Dinther and Ovink "The Five Pillars of Climate Resilience" 6-7; Zanotti *et al* 2020 *Ecology and Society* 1-2; O'Connell *et al The Resilience, Adaptation and Transformation Assessment Framework: from Theory to Application* 22.

204 See Walker *et al* 2004 *Ecology and Society* 3; Seager *et al* "Redesigning Resilient Infrastructure Research" 85.

2.2.2 Climate resilience

Climate change is not a new occurrence by any means, and scientists have been warning about its increasing dangers for decades.[205] It is generally well-defined and, simply put, relates to changes in climate patterns.[206] These changes in climate patterns are mainly the result of greenhouse gas (GHG) emissions such as carbon dioxide (CO_2) and other pollutants being emitted into the atmosphere. Such emissions cause an alteration of the atmospheric and biosphere composition.[207] The effect of the altered composition is ecological degradation, the formation of heat-islands, unpredictable weather variability, and an increased occurrence of natural disasters such as sea-level rise, heatwaves, floods and droughts, among others.[208] Human activities such as fossil fuel and biofuel combustion, industrial processes, energy generation, waste generation, unsustainable land use, and agriculture and livestock farming exacerbate this phenomenon.[209]

In view of the definition of resilience above, the discussion regarding climate change, and the need for resilience to the effects thereof, it is argued that climate resilience pertains to the ability of a system to deal with, adapt to, and recover from climate-related events. These climate-related events would typically include specific hazardous events such as sudden-onset natural disasters like floods, earthquakes, and hurricanes, or general climate change-related issues such as rainfall variability, sea-level rise, rises in temperatures, and droughts that occur over a longer period of time. The effects of climate change are apparent from phenomena such as increases in urban temperatures and weather variability, reduction in air quality, increased demand for water and energy, lower water quality and water security, and resultant negative impacts on the health and well-being of people.[210]

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205 UN 2022 https://www.un.org/en/climatechange/what-is-climate-change; Hornsey and Fielding 2019 *Social Issues and Policy Review* 3-4.

206 Fawsy *et al* 2020 *Environmental Chemistry Letters* 2070.

207 Malhi *et al* 2020 *Phil. Trans. R. Soc. B* 1-2; Oke *et al Urban Climates* 294-295.

208 Dawson and Spannagle *The Complete Guide to Climate Change* 97-99.

209 Tol *The Economic Impact of Climate Change* 2-3; IPCC "AR 6 Working Group III Climate Change 2022: Mitigation of Climate Change" 4-9.

210 See De Graaf-van Dinther and Ovink "The Five Pillars of Climate Resilience" 2; Adom, Simatele and Reid 2022 *American Journal of Environment and Climate* 73-76; Edokpayi *et al* "Influence

2.2.3 Risk and vulnerability

It is necessary in the context of this study to discern the notions of (disaster) risk and vulnerability as opposed to resilience.[211] The adaptability and flexibility of systems presupposed by the idea of resilience have the potential to reduce risk and vulnerability in city systems.

Firstly, (disaster) "risk"[212] elucidates

> the likelihood over a specified time period of severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic, or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery.[213]

From this definition, it is argued that risk denotes the likelihood of an event leading to adverse effects (be it social, economic, or environmental). Furthermore, in the context of this study, risk is related to the likelihood of a climate-related disaster. This definition specifically notes that risk is intricately linked with vulnerability, in that vulnerable social conditions often lead to higher risk and more severe effects from disastrous events.

Vulnerability, as a component of risk,[214] is understood as "the state of individuals, groups or communities in terms of their ability to cope with and adapt to any external stress placed on [them]."[215] The IPCC defines "vulnerability" as:

> the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.[216]

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of global climate change on water resources in South Africa: toward an adaptive management approach" 83; Chersich *et al* 2018 *International Journal of Environmental Research and Public Health* 6-9; Ciccarelli and Marotta 2024 *Energy Economics* 1.

211 Pelling *Adaptation to Climate Change: From Resilience to Transformation* 72.

212 For purposes of this study, the definition of "disaster risk" as proposed by the IPCC is used to describe "risk" as it is most fitting for the context of the discussion in this study.

213 IPCC "Annex II: Glossary of Terms" 558.

214 IPCC "AR6" 133.

215 Adger and Adger 1999 *Mitigation and Adaptation Strategies for Global Change* 254.

216 IPCC "Annex II: Glossary of Terms" 1775.

This definition indicates that vulnerability refers to the "degree to which a system is susceptible to and unable to cope with adverse effects of climate."[217] Vulnerability relates strongly to socio-economic liability in that it is critically dependent on the availability and access to resources that secure livelihood and ensure the strengthened ability to recover after calamitous events.[218] Vulnerable groups, such as those trapped in poverty who do not have access to the necessary resources to combat disaster, are predisposed to living in unsafe areas.[219] As discussed below, risk and vulnerability are especially prevalent in developing countries, where many inhabitants are located in areas that are exposed to a range of threats, such as natural disasters, for example.[220] These at-risk and vulnerable areas do not have the requisite infrastructure or municipal services needed to safeguard against these threats.[221] The risk and vulnerability of a city can arguably be alleviated by improving urban climate resilience as it encourages, *inter alia*, better urban planning and municipal decision-making and results in reduced susceptibility to the impacts of climate disasters. Vulnerability also occurs at a physical (which includes the built and natural environment), social and economic level, and arguably also at an institutional and government level.[222]

2.2.4 Urban climate resilience

2.2.4.1 The "urban" in urban climate resilience

Cities are complex, dynamic, hybrid systems consisting of a composite of ecological, social, economic, and technical components, as will be emphasised further on.[223] In

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217 Brooks *Vulnerability, Risk and Adaptation: A Conceptual Framework* 5.

218 Proag 2014 *Procedia Economics and Finance* 370.

219 Proag 2014 *Procedia Economics and Finance* 371.

220 See also para 1.1 above.

221 Di Ruocco, Gasparini and Weets "Urbanisation and Climate Change in Africa: Setting the Scene" 2-7; Tyler and Moench 2013 *Urban Climate* 101.

222 This includes systemic vulnerabilities of sectors such as technical, political, environmental, ecological, economic, legal, social, and organisational. See Proag 2014 *Procedia Economics and Finance* 371-373.

223 Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 43; Savard, Clergeau and Mennechez 2000 *Landscape and Urban Planning* 139; Rebele 1994 *Global Ecology & Biogeography Letters* 174. See also Alberti *Advances in Urban Ecology Integrating Humans and Ecological Processes in Urban Ecosystems* 1; Breuste, Niemelä and Snep *2008 Landscape Ecology* 1141.

addition, cities are considered ecosystems in and of themselves, i.e., urban ecosystems. Urban ecosystems consist of abiotic and biotic spheres and are considered complex systems.[224] Further, urban ecosystems comprise various urban habitats formed by several elements.[225] These urban ecosystems that form in cities are made up of a combination of buildings (or built-up areas), whether for residential, commercial, or industrial purposes or other infrastructure; natural and human-made water bodies (blue patches); and green patches like gardens, parks, and land.[226] The so-called urban ecosystems form due to the interactions between human and ecological systems and their distinct processes, which typically cause changes to occur in the structure and functioning of ecosystems within cities.[227]

Globalisation and urbanisation have resulted in the creation of interlinkages and interdependencies between cities and surrounding areas (including natural ecosystems) through the exchange of materials and energy.[228] This demonstrates that the urban ecosystem, as a whole, is ambiguously intertwined, ultimately meaning that a change in one component or process can impact other components of the city as an ecosystem.[229] Changes in the city (whether land use, layout, ecological, demographic, resource availability, or social changes) and its component parts are inevitable when one considers the dynamics as alluded to above.

Urban resilience is becoming more important as the majority of the world's population lives in urban areas, and as established above, cities are not isolated

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224 Marzluff *et al* "An Introduction to Urban Ecology as an Interaction between Humans and Nature" ix.

225 Rebele 1994 *Global Ecology & Biogeography Letters* 175.

226 Douglas 2012 *Current Opinion in Environmental Sustainability* 385; Mundoli, Unnikrishnan and Nagendra 2017 *Decision* 105; Ernstson 2013 *Landscape and Urban Planning* 8; Kaklauskas and Gudauskas "Intelligent Decision-Support Systems and the Internet of Things for the Smart Built Environment" 418; Botes *Legal Protection of 'Microclimate Regulation' as an Urban Ecosystem Service in South Africa* 19.

227 Alberti *Advances in Urban Ecology Integrating Humans and Ecological Processes in Urban Ecosystems* 252; Du Toit and Cilliers "Urban Ecology" 2; Endlicher *et al* "Urban Ecology – Definitions and Concepts" 1; Douglas "Introduction" 3; Botes *Legal Protection of 'Microclimate Regulation' as an Urban Ecosystem Service in South Africa* 13 and 18; Chapin, Matson and Mooney *Principles of Terrestrial Ecosystem Ecology* 14-16.

228 Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 43.

229 Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 43.

from global challenges such as climate change.[230] Cities are particularly vulnerable as a result of rampant urbanisation, unabated urban sprawl and expansion of the built environment, as well as growing population size and density, as alluded to above.[231] Projections show that these trends will persist over the next few decades and that more cities and megacities will form, especially in developing countries and the global South.[232] The increase in the number of people living in urban settlements can be ascribed to the general features of cities as centres of economic activity, job opportunities, and innovation, as well as the general perception of cities as places that offer better livelihoods.[233] This unplanned or inadequately managed urban expansion undermines and threatens ecological security[234] in many cities. It does so by exacerbating challenges such as resource constraints, pollution, ecological degradation, and the effects of climate change that cities face.[235]

Cities, however, are considered significant contributors to changes in the environment and climate change as they are inadvertently responsible for significant amounts of GHG emissions and energy usage, unsustainable land use patterns, excessive waste generation and water use.[236] These changes in natural systems, along with the challenges faced in urban areas, can, in some instances, be disastrous if they are not adequately addressed. Furthermore, these changes can result in unexpected and unpredictable shocks or an accumulation of stresses that influence the integrity of city infrastructure, result in resource shortages, lead to

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230 UN-Habitat *World Cities Report 2022* xvi.

231 See para 1.1 above.

232 UN *The World's Cities in 2018: Data Booklet* 5.

233 Spires *et al Building Resilience in African Cities: A Think Piece* 5; The Rockefeller Foundation and Arup *City Resilience Framework* 3; UNDP *Issues Brief on Urban Climate Resilience* 1; UN *World Urbanization Prospects: The 2018 Revision* 3. See also para 1.1 above.

234 Ecological security is defined as the "maintenance of [the] dynamic equilibria in continually evolving relationships among human societies and between them and [the] components of the ecosystems in which they are embedded." Pirages "Ecological Security: A Conceptual Framework" 143. This includes the relationships between human societies and natural resources and ecosystem services, human societies and pathogenic microorganisms, human societies and other animal species, and among human societies in and of themselves. See Pirages "Ecological Security: A Conceptual Framework" 143. See also McDonald *Ecological Security* 97-101.

235 Hodson and Marvin "Securitization of Urban Environments" 91; UN *World Urbanization Prospects: The 2018 Revision* 1; Allam, Jones and Thondoo *Cities and Climate Change* 12-13.

236 Martin-Moreau and Ménascé 2018 *Field Actions Science (FACTS) Reports* 9; Oke *et al Urban Climates* 1-2, McCarthy *et al* 2010 *Geophysical Research Letters* 1-5; Dulal 2017 *Local Environment* 107.

more frequent natural disasters, and negatively impact socio-economic development in urban areas.[237] Climate change places immense stress on city-ecosystems and renders these systems more vulnerable to risk, especially if they do not have the necessary resilience to withstand, endure, or adapt to these shocks or stresses.[238] As elucidated above,[239] urban areas contain both natural and man-made ecosystems. With this in mind, it is argued that ecological resilience is required within these urban areas.[240] Consequently, cities need to be able to deal with the stressors and disturbances that occur and still retain their functionality, structure, and processes.[241]

Despite some of the negative connotations of urbanisation, it can also be considered beneficial for "economic growth, poverty reduction and human development" when cities are well-planned, and development considers these challenges and addresses them in a sustainable manner.[242] This is not the case, however, for many developing countries, especially on the African continent, where urbanisation is accelerating rampantly.[243] African cities are growing rapidly, and the majority of this growth is in the form of informal settlements on the city peripheries. These areas are generally at risk due to inadequate infrastructure to carry the weight of the population growth, persistent poverty and inequality faced by many, along with exacerbated vulnerability of the urban poor.[244] This illustrates a need for African cities to address and improve their resilience.[245] It is argued that the contemporary challenges caused by uncertainty, globalisation, interconnectedness of systems, as well as disparity, can be addressed or understood through so-called resilience thinking.[246] Resilience

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237 An increase in risk is imminent in cities due to the vast amount of people in cities, the unpredictability and complexity of city systems, and the uncertainty that accompanies many disasters. The Rockefeller Foundation and Arup *City Resilience Framework* 3.

238 The Rockefeller Foundation and Arup *City Resilience Framework* 3.

239 See para 2.1 above.

240 Sharifi and Yamagata "Resilience-Oriented Urban Planning" 3-4.

241 Leichenko 2011 *Current Opinion in Environmental Sustainability* 164.

242 UN *World Urbanization Prospects: The 2018 Revision* 1; Satterthwaite *The Transition to a Predominantly Urban World and its Underpinnings* vii; Satterthwaite and Tacoli *The Urban Part of Rural Development* 7.

243 Otu 2022 *ESCET Journal of Educational Research and Policy Studies* 28.

244 Spires *et al Building Resilience in African Cities: A Think Piece* 6; Otto-Zimmerman "Building the Global Adaptation Community" 4.

245 Spires *et al Building Resilience in African Cities: A Think Piece* 6.

246 Folke 2016 *Ecology and Society* 6.

thinking is a concept that developed in the field of ecology and is described as a "conceptual framework to describe models of change in the structure and function of ecological systems".[247] Resultantly, it is pertinent that resilience thinking be applied to urban development and planning in order to improve urban climate resilience.[248]

The importance of cities in the fight against climate change has gained significance in the last decade, with considerable focus on the mitigation and adaptation responses they can provide.[249] Climate mitigation and adaptation are, for the purposes of this study, considered to be subsets of resilience in that they provide measures and responses through which resilience can be enhanced.[250] Mitigation is, by its nature, reactive and aims to respond to the effects of climate change and reduce and reverse these effects.[251] Adaptation is inherently proactive and seeks to reduce vulnerability to future climate events and improve the capacity and ability to adapt to such changes.[252] Mitigation and adaptation should be used concurrently in order to enhance urban climate resilience.

2.2.4.2 The definition of urban climate resilience

Building on the more general definitions of resilience and climate resilience above,[253] urban climate resilience, therefore, refers to the ability of an urban system (city) and its component parts to withstand, absorb, adapt to, self-organise, resist, accommodate, recover from, resile from, "bounce back", and "bounce forward" from climate specific and related shocks and stresses.[254] When one considers city governance, these verbs denote adequate mitigation and adaptation measures, adaptive and transformational local law and policy making, planning practices that

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247 Eraydin and Taşan-Kok "Introduction: Resilience Thinking in Urban Planning" 5.
248 Sharifi and Yamagata "Resilience-Oriented Urban Planning" 4.
249 See, for example, Dodman, Archer and Satterthwaite 2019 *Environment & Urbanization* 1; Leichenko 2011 *Current Opinion in Environmental Sustainability* 164.
250 See Zolnikov "Introduction to Climate Change Vulnerability, Adaptation, and Resiliency" 3.
251 Pelling *Adaptation to Climate Change: From Resilience to Transformation* 36. See also Zolnikov "Introduction to Climate Change Vulnerability, Adaptation, and Resiliency" 3.
252 Pelling *Adaptation to Climate Change: From Resilience to Transformation* 36. See also Zolnikov "Introduction to Climate Change Vulnerability, Adaptation, and Resiliency" 3.
253 See paras 2.2.1 and 2.2.2 above.
254 Leichenko 2011 *Current Opinion in Environmental Sustainability* 164. See also para 2.2.1 above.

are cognisant of resilience thinking, and municipal disaster preparedness and awareness plans and programmes.

Many authors have sought to delineate what urban climate resilience would comprise. Henstra,[255] for example, defines a climate-resilient city as one that can withstand climate change stresses, respond effectively to climate-related hazards, and recover quickly from residual negative impacts. The majority of suggested typologies for (urban climate) resilience uses words such as "characteristics",[256] "dimensions",[257] "qualities",[258] "indicators", "elements",[259] "features", "pathways",[260] "pillars" of resilience,[261] "approaches", and the like. These disparities in the perspectives regarding what resilience entails have produced generalised characteristics of resilience that appear more often throughout the literature than other so-called elements, dimensions or pillars. These characteristics include, *inter*

255 Henstra 2012 *Journal of Comparative Policy Analysis: Research and Practice* 178.

256 See Tyler and Moench 2012 *Climate and Development* 313-314.

257 Maruyama "Taxonomy and General Strategies for Resilience" 4; Turok 2014 *Environment and Planning A* 8.

258 See Arup and The Rockefeller Foundation *Climate Resilience Framework* 5; Asian Development Bank *Urban Climate Change Resilience: A Synopsis* 7. The qualities of resilience are reflective, robust, integrated, resourceful, flexible, redundant, and inclusive.

259 Tyler and Moench 2012 *Climate and Development* 312. These authors identify the elements of urban resilience as systems, agents and institutions.

260 Meerow *et al* 2016 *Landscape and Urban Planning* 44.

261 De Graaf-van Dinther and Ovink "The Five Pillars of Climate Resilience" 6-7.

alia, reflectivity,[262] robustness,[263] redundancy,[264] resourcefulness,[265] inclusivity,[266] flexibility,[267] integratedness,[268] adaptive capacity,[269] and diversity.[270] Other characteristics and "features" found in the literature include, among others, preparedness, absorption, equity, decentralisation, responsiveness, capacity to learn, and transformation.[271]

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262 Reflectivity is seen as referring to a system's capability to learn from past occurrences and build upon its knowledge to continuously improve and adapt to ever-changing circumstances based on perceived evidence instead of permanent, once-off and rigid or unsustainable solutions. See Asian Development Bank *Urban Climate Change Resilience* 7; The Rockefeller Foundation and Arup *City Resilience Index* 5. This characteristic may also appear in the literature as the capacity to learn, as they are intrinsically the same thing, i.e., learning from past experience and improving performance. See also Tyler and Moench 2012 *Climate and Development* 316.

263 Robustness is an indication of the ability of a city's physical assets and environment to withstand the impacts of extreme conditions and retain its functionality without devastating damage, they anticipate the possibility of failure and systems and are not over reliant on a single asset or system. See The Rockefeller Foundation and Arup *City Resilience Index* 5; Asian Development Bank *Urban Climate Change Resilience* 7.

264 Redundancy, in the current context, refers to the spare capacity within a city, so that in the event of one system failing or increased demand and pressure on systems. This is essentially a backup plan, providing that other measures or substitute components are in place if needed. In many instances, this means that there are multiple functionaries that can do the same job, and one can then step in when another fails. The Rockefeller Foundation and Arup *City Resilience Index* 5; Asian Development Bank *Urban Climate Change Resilience* 7. This characteristic also appears in the literature as system diversity. See Spires *et al Building Resilience in African Cities: A Think Piece* 9.

265 Resourcefulness refers to "the capacity to mobilise assets and resources" in extreme events and includes planning for the future and the predictability of failure, and identifying shortcomings where resources might be prioritised. See Tyler and Moench 2012 *Climate and Development* 316; Asian Development Bank *Urban Climate Change Resilience* 8.

266 Inclusivity denotes the collaboration and cooperation of multiple stakeholders and involves community participation and involvement in planning and decision-making, including and especially in terms of vulnerable groups, as they will undoubtedly be affected by the decisions. See Turok 2014 *Environment and Planning A* 7-8; Asian Development Bank *Urban Climate Change Resilience* 8; The Rockefeller Foundation and Arup *City Resilience Index* 5.

267 Flexibility "implies that systems can change, evolve and adapt to changing circumstances." This could also construe the adaptive capacity of an urban system. See Tyler and Moench 2012 *Climate and Development* 314; Asian Development Bank *Urban Climate Change Resilience* 8; The Rockefeller Foundation and Arup *City Resilience Index* 5; Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 46.

268 Integratedness is required in the sense that city systems, agents and institutions, along with decision-making, serve a common outcome based on multi-level cooperation, be transparent, representative, accountable, and that there is alignment between city systems and consistency in decision-making. See The Rockefeller Foundation and Arup *City Resilience Index* 5; Tyler and Moench 2012 *Climate and Development* 318; Asian Development Bank *Urban Climate Change Resilience* 8-9.

269 Adaptive capacity – see flexibility above. See also Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 44.

270 Diversity – see redundancy above.

271 Kuhlicke, Kabish and Rink "Urban Resilience and Urban Sustainability" 20.

Further to the conceptualisation of urban climate resilience, Desouza and Flanery[272] identify various physical and societal components within a city, the stressors that impact a city, the outcomes of stress, and interventions (such as designing, planning, and managing) for building resilient cities through networks, agents and systems. This is a similar approach to that taken by Godschalk,[273] and subsequently incorporated and illustrated by Tyler and Moench,[274] who also set out the physical and societal components of a city, along with the interconnectedness of its communities, decision makers, policies, etc. Building on these ideas, Van der Berg and Verschuuren,[275] extend the notion of resilience, as it relates to cities and climate change, to include the institutional and governance structure, the urban built environment, and the citizens and communities within urban areas.

For urban resilience, the "generalisable elements" identified by Tyler and Moench include, for example, systems, agents, and institutions and are depicted by their catalysation of urban climate resilience as shown in Figure 2-1 below.[276] In considering the generalisable elements proposed, the authors argue that cities are reliant on systems such as infrastructure, investment, ecosystems and other support systems for the delivery of services, the livelihoods of their inhabitants, and their continued functionality.[277] They rely on general characteristics of resilience to support these systems. The authors further propose the integration of social agents and institutions, considering specifically the SES prevalent in cities, and that the agents ought to have adaptive capacity.[278] It is the "agents" in their model that are responsible for decision-making as they are the ones with the capacity to deliberate, analyse, interact, make informed choices, learn and innovate.[279] It is arguable that this would be where local governments fit into the urban resilience discourse. The last element suggested by these authors refers to institutions, or rather, as they

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272 Desouza and Flanery 2013 *Cities* 91.
273 Godschalk 2003 *Natural Hazards Review* 136-137.
274 See Tyler and Moench 2012 *Climate and Development* 313-314.
275 Van der Berg and Verschuuren *Urban Climate Resilience: The Role of Law* 4.
276 Tyler and Moench 2012 *Climate and Development* 312.
277 Tyler and Moench 2012 *Climate and Development* 313. See also Satterthwaite 2013 *Environment and Urbanization* 383.
278 Tyler and Moench 2012 *Climate and Development* 313-314.
279 Tyler and Moench 2012 *Climate and Development* 314-315.

clarify in their research, "social rules and conventions that structure human behaviour".[280] These rules and conventions serve the purpose of conditioning the way that systems and agents interact and reduce uncertainty, and may be enabling or constricting.[281] In other words, institutions include constraints devised to structure the socio-economic and political interactions in complex systems, and include formal rules like constitutions, laws and rights, and informal constraints like customs, traditions, societal values, codes of conduct and sanctions, for example.[282] This is arguably where law and policy frameworks fit in. According to the authors, these so-called elements contain "key normative characteristics" that may be used to develop a conceptual framework for urban resilience planning at a local level.[283] The typology suggested for this study draws from the model suggested by Tyler and Moench.[284] In addition, this study argues that the socio-technical components of a city (which include the systems and institutions in the above conceptualisation) are used to measure and demonstrate the progress towards climate resilience,[285] which necessitates the distinction of features of urban climate resilience.[286]

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280 Tyler and Moench 2012 *Climate and Development* 315.

281 See Tyler and Moench 2012 *Climate and Development* 315; Turok 2014 *Environment and Planning A* 5.

282 North 1991 *Journal of Economic Perspectives* 97; Ahrens and Rudolph 2006 *Journal of Contingencies and Crisis Management* 209.

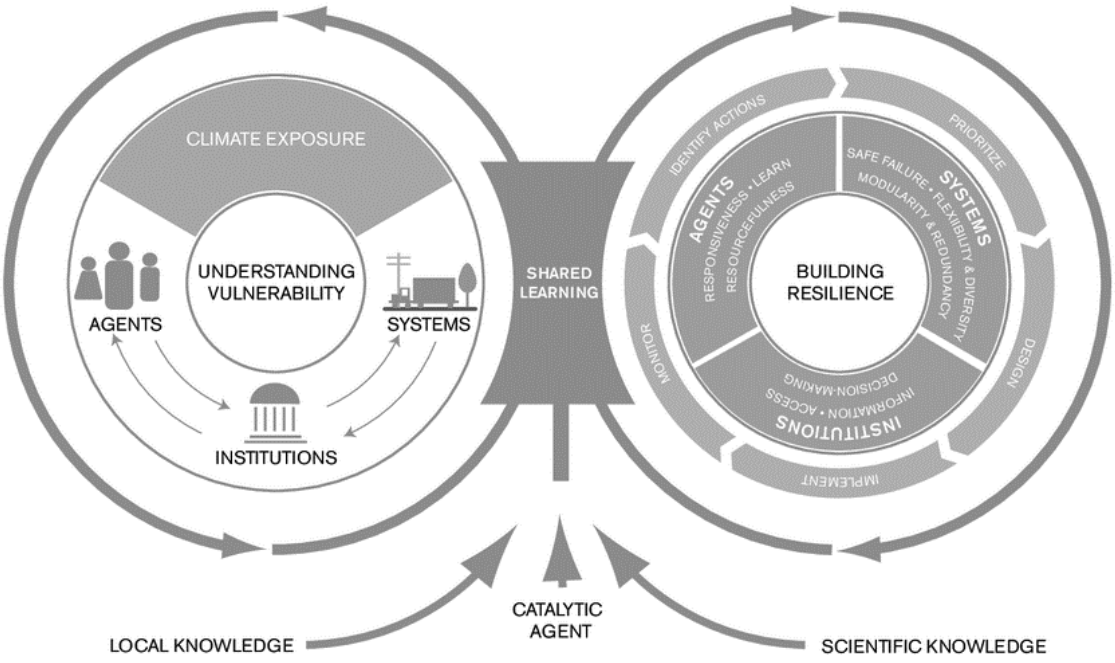
283 Tyler and Moench 2012 *Climate and Development* 312.

284 See Figure 2-7 below; Figure 2-1 below; Tyler and Moench 2012 *Climate and Development* 321.

285 Da Silva, Kernaghan and Luque 2012 *International Journal of Urban Sustainable Development* 126.

286 See para 2.3 below.

Figure 2-1: Catalysing Urban Climate Resilience[287]



The model for catalysing urban climate resilience suggested by Tyler and Moench (depicted in Figure 2-1) illustrates the interactions of systems, agents and institutions by including considerations of risk and vulnerability to climate exposure. It also illustrates the responses and actions available in building resilience in the systems, agents and institutions, through shared learning between local knowledge to foster understanding of vulnerabilities and scientific knowledge for evidence-based response and action.

Additional approaches to defining urban climate resilience include, for example, that of Meerow and colleagues,[288] who identify what they refer to as "mechanisms" or "pathways" to urban resilience, namely, persistence, transition and transformation. According to them, systems such as cities should be able to resist disturbance and retain their function by persisting regardless of the disturbance, adapting

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287 The figure depicting the elements of urban climate resilience as originally developed by Tyler and Moench and applied to resilience planning. See Tyler and Moench 2012 *Climate and Development* 321; also see Moench, Tyler and Lage *Catalysing Urban Climate Resilience* 68. See also Figure 2-7 that shows how these elements are linked to the typology used in this study – see para 2.3 below.

288 Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 44.

(transitioning from one state to another), or transforming (purposefully changing their structure).[289] These pathways to resilience are echoed in the research of Chelleri.[290]

De Graaf-van Dinther and Ovink[291] established five "capacities or pillars" of climate resilience, namely, threshold capacity, coping capacity, recovery capacity, adaptive capacity and transformative capacity. These pillars encapsulate and epitomise the characteristics mentioned above. Accordingly, the model provides that systems build up a threshold against environmental variation to prevent or limit damage, cope and deal with extreme conditions and reduce damage, "bounce back" to an equal or better state than before the extreme conditions, anticipate uncertain future developments and be prepared to adapt thereto, and lastly, create an enabling environment and transition pro-actively to a more resilient state.[292] Furthermore, as alluded to above,[293] adaptive and transformative capacity supports the idea of transformational adaptation, which encapsulates fundamental, holistic, and systemic changes in the traits of a city in terms of its physical environment, infrastructure, socio-economic and environmental aspects, as a response to the effects of climate-related impacts.[294] This type of adaptation is aimed at addressing the root causes of vulnerability in order to achieve resilience.[295] Ribeiro and Gonçalves[296] suggest four similar basic pillars of urban resilience, namely resisting, recovering, adapting and transforming. Additionally, the typology below also draws from Chen *et al*[297] who identify and discuss dimensions of resilience, consisting of the physical, natural, economic, institutional and social dimensions.

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289 Meerow, Newell and Stults 2016 *Landscape and Urban Planning* 44.
290 Chelleri 2012 *Documents d'Anàlisi Geogràfica* 295-297.
291 De Graaf-van Dinther and Ovink "The Five Pillars of Climate Resilience" 6-7.
292 De Graaf-van Dinther and Ovink "The Five Pillars of Climate Resilience" 7. See also Tong 2021 *International Journal of Disaster Risk Reduction* 2.
293 See para 2.2.1 above.
294 Van der Berg 2022 *European Journal of Risk Regulation* 6; Chu *et al Unlocking the Potential for Transformative Climate Adaptation in Cities* 1; Simon and Leck 2015 *Current Opinion in Environmental Sustainability* 111. See also Filho *et al* 2019 *Science of the Total Environment* 1177.
295 Van der Berg 2022 *European Journal of Risk Regulation* 6.
296 Ribeiro and Gonçalves 2019 *Sustainable Cities and Society* 4.
297 Chen *et al* 2020 *Safety science* 2.

There are some obvious overlaps between the propositions of the different authors in the wider resilience discourse, with many of their definitions referring to what are, in principle, the same ideas of the interdependency of components in city systems, and the ability and capability of systems to resist, recover and adapt after extreme events. Furthermore, they seem to generally agree on the need for agents (i.e., actors responsible in the system) and institutions or guidelines that control these actors and their varied interactions within systems. These typologies are all grounded in the urban system framework with its component physical and social parts, the idea of agencies working collaboratively and cooperatively toward a common outcome, community involvement and inclusivity, reducing vulnerability and building knowledge, and learning from past experiences and failures to obtain better future outcomes.

2.2.4.3 Determining the features of urban climate resilience

In addition to the scholarly discourse set out above, there are further useful and encompassing resources that build on the theoretical framework discussed and provide general guidelines in terms of what a resilient city or urban climate resilience entails. Notably, these sources include, for example, the City Resilience Index,[298] the City Resilience Action Planning Tool (CityRAP),[299] the United Nations office for Disaster Risk Reduction's (UNDRR) City Resilience Scorecard[300] and Ten Essentials for Making Cities Resilient,[301] and the UN-Habitat City Resilience Profiling Tool (CRPT).[302] The general features of urban climate resilience may very well be distilled from these existing formulations of what is considered to be included in urban climate resilience. These formulations are discussed here as they inform the eventual typology and categorisation that this study uses in this chapter to identify the general features of urban climate resilience.

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298 Arup and The Rockefeller Foundation *City Resilience Index* 7.
299 UN-Habitat *City Resilience Action Planning Tool* 10.
300 UNDRR 2017 https://www.unisdr.org/campaign/resilientcities/toolkit/article/disaster-resilience-scorecard-for-cities.html.
301 UNDRR *How to Make Cities More Resilient: A Handbook for Local Government Leaders* 31-32.
302 UN-Habitat 2018 https://tinyurl.com/22nk86vy.

2.2.4.3.1 City Resilience Index

The City Resilience Index (as depicted in Figure 2-2) comprises four "dimensions" related to the resilience of a city, namely health and well-being, economy and society, infrastructure and environment, and leadership and strategy.[303] Furthermore, these dimensions are underpinned by twelve goals (three goals each) that cities should aim to achieve for resilience.

The goals under the health and well-being dimension include a) minimal human vulnerability (which relates to things such as safe and affordable housing, adequate affordable energy supply, access to safe drinking water, effective sanitation, and sufficient affordable food supply); b) diverse livelihood and employment (linked to inclusive labour policies, relevant skills and training, local business development and innovation, diverse protection of livelihoods after shock or disaster); and c) effective safeguards of human health and life (that include robust public health systems, adequate access to quality healthcare, emergency medical care, and effective emergency response services).[304]

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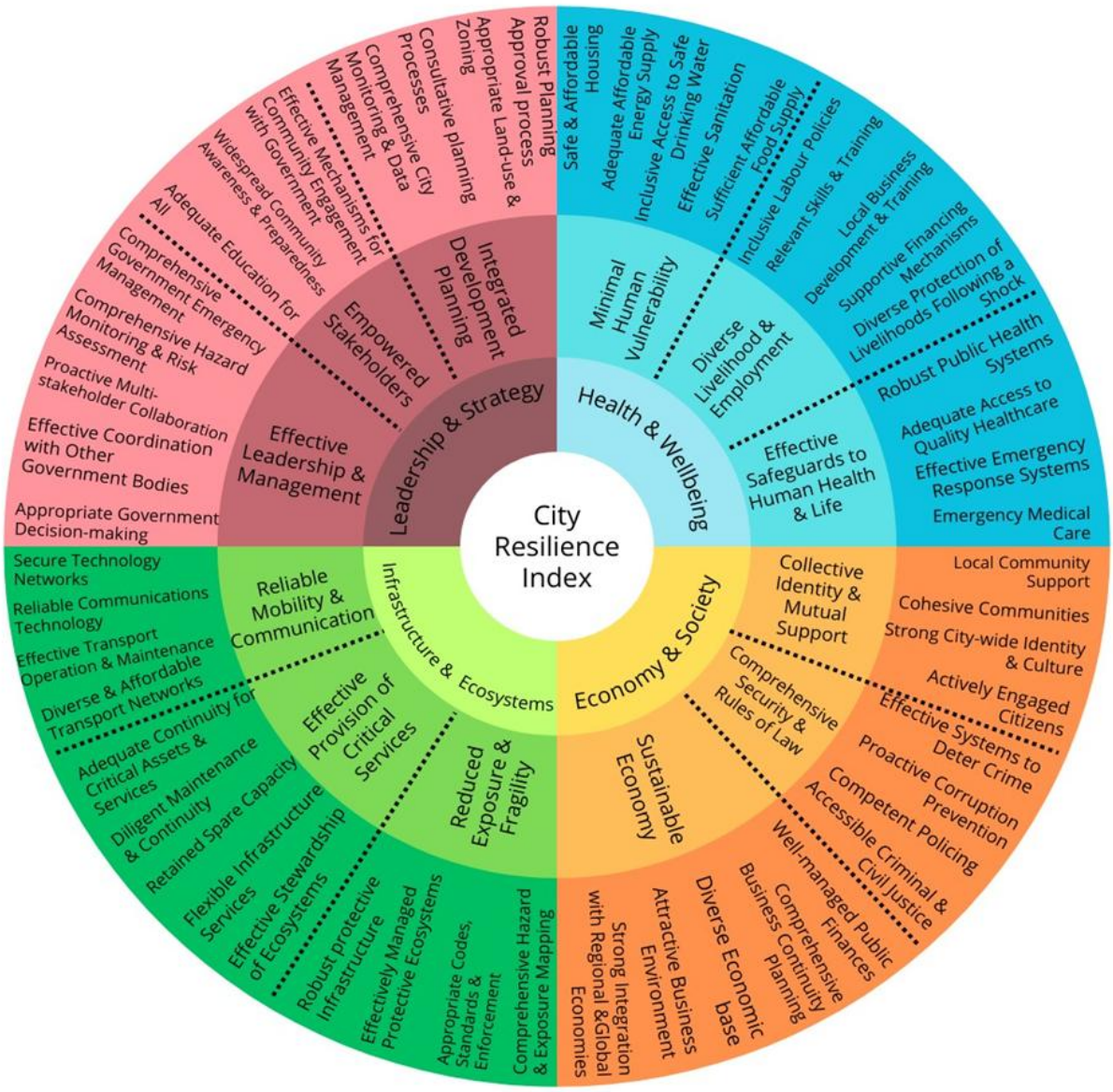
303 Arup and The Rockefeller Foundation 2018 https://www.cityresilienceindex.org/#/; The Rockefeller Foundation and Arup *City Resilience Framework* 8; see also Rijke *et al* "Removing Challenges for Building Resilience with Support of the Circular Economy" 113.

304 See The Rockefeller Foundation and Arup *City Resilience Index Brochure* 18-19.

Figure 2-2: City Resilience Index[305]



The goals underpinning the dimension for economy and society include a) collective identity and mutual support (i.e., local community support, cohesive communities, strong city-wide identity and culture, and actively engaged citizenry); b) comprehensive security and the rule of law (that means, effective systems to deter crime, proactive corruption prevention, competent policing, and accessible criminal and civil justice); and c) sustainable economy (that includes well-managed public finances, comprehensive business continuity planning, a diverse economic base, and

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305 This figure is based on the index as originally designed by Arup and The Rockefeller Foundation. See Arup and The Rockefeller Foundation *City Resilience Index* 17. See also Croese, Green and Morgan 2020 *Sustainability* 4.

attractive business environment, and strong integration with regional and global economies).[306]

For the infrastructure and ecosystems dimension, the goals include a) reduced exposure and fragility (in the form of data collection containing comprehensive hazard and exposure mapping, appropriate codes, standards, and enforcement, effectively managed protective ecosystems, and robust protective infrastructure); b) effective provision of critical services (including the effective stewardship of ecosystems, flexible infrastructure, retained spare capacity, and adequate continuity for critical assets and services); and c) reliable mobility and communications (meaning diverse and affordable transport networks, effective transport operation and maintenance, reliable information and communication technology (ICT), and secure technology networks).[307]

The last dimension, leadership and strategy, is strengthened by a) effective leadership and management (that includes appropriate government decision-making, effective co-ordination with other government bodies, proactive multi-stakeholder collaboration, comprehensive hazard monitoring and risk assessment, and comprehensive government emergency management); b) empowered stakeholders (consisting of adequate education for all, widespread community awareness and preparedness, and effective mechanisms for communities to engage with government); and c) integrated development planning (entailing comprehensive city monitoring and data management, consultative planning processes, adequate land use and zoning, and robust planning approval processes).[308]

These dimensions and goals are further supported by 52 indicators (see Figure 2-2 above) and are measured against seven general qualities that resilient cities should have.[309] These qualities are considered to be determinants of breakdown and failure

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306 The Rockefeller Foundation and Arup *City Resilience Index Brochure* 21.
307 The Rockefeller Foundation and Arup *City Resilience Index Brochure* 23.
308 The Rockefeller Foundation and Arup *City Resilience Index Brochure* 25.
309 These qualities are a) reflectiveness; b) robustness; c) redundancy; d) flexibility; e) resourcefulness; f) inclusivity; and g) integration.

prevention and of enabling appropriate action to be taken.[310] The Prairie Climate Centre also uses these characteristics for resilient cities and outlines steps that cities can take to engage in climate risk management, and applies them in relation to a range of sectors. These sectors include, for example, economics and finance,[311] agriculture and food security,[312] urban ecosystems,[313] transportation infrastructure,[314] water supply and sanitation systems,[315] electricity and ICT infrastructure,[316] the built environment,[317] and disaster preparedness and emergency

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310 See Arup and the Rockefeller Foundation 2018 https://www.cityresilienceindex.org/#/; The Rockefeller Foundation and Arup *City Resilience Framework* 8.

311 The impacts of climate change on cities have large financial implications for cities as they might need to repair infrastructure and invest in climate resilience to reduce exposure to the risks associated with climate change impacts. Cities can also use economics and financing methods to increase investment and to monetise the value of ecosystem services to identify priority natural and green infrastructure. McCullough *Building a Climate-Resilient City: Economics and Finance* 1-11. However, the valuation of ecosystem services is highly criticised due to the risk of undervaluation and disregard for inherent value of the environment and its ecosystems – See Morrow "Of Human Responsibility: Considering the Human/Environment Relationship and Ecosystems in the Anthropocene" 277; and Suarez and Dempsey "Ecosystem Services" 177.

312 Climate change also affects the food supply chain systems and cities, therefore, need to strengthen local food systems and increase the resilience of the city to shocks or stresses created by the impacts of climate change. Temmer *Building a Climate-Resilient City: Agriculture and Food Security* 1-9.

313 Healthy and well-managed ecosystems are crucial in mitigating natural disturbances and extreme weather events, and also contribute to the health and well-being of humans and deliver important services. Terton *Building a Climate-Resilient City: Urban Ecosystems* 1-9.

314 The resilience and adaptation of transport infrastructure in cities is crucial since this infrastructure is constantly exposed to the impacts of climate change, and sustainable transportation systems are needed to deal with the stresses that climate change causes on these systems. Temmer and Venema *Building a Climate-Resilient City: Transportation Infrastructure* 1-9.

315 Water and sanitation systems are crucial to ensuring the health and well-being of human beings in cities, and in many countries are considered a fundamental human right. Water is, further, a crucial element in mitigating climate change. It is, therefore, important to build and maintain a water supply system that is resilient to climate shocks and stresses, and to conserve water systems and develop green infrastructure components and options for water management. Venema and Temmer *Building a Climate-Resilient City: Water Supply and Sanitation Systems* 1-9.

316 Climate change causes climate variabilities and affects the microclimate regulation services of urban ecosystems, and as a result causes increases in the need for cooling or heating of urban buildings in which humans work, live or move within the city and leads to stresses on the electricity grid and higher energy consumption and higher emissions of GHG. Renewable energy generation and storage technologies are needed to increase city resilience. Venema and Temmer *Building a Climate-Resilient City: Electricity and Information and Communication Technology Infrastructure* 1-7.

317 The built environment (which is mainly what cities are made up of) mostly consists of impermeable surfaces and dark heat-generating or storing surfaces, leading to urban heat-islands in cities and thus contributing to climate change in cities. The built environment is regulated through spatial planning. Venema and Temmer *Building a Climate-Resilient City: The Built Environment* 1-7.

management.[318] Some of these indicators are ubiquitous in the literature and are therefore used to inform the general features of urban climate resilience for the purposes of this study.[319]

2.2.4.3.2 City Resilience Framework

To the same accord, the City Resilience Framework outlines the characteristics of resilient cities using the City Resilience Index depicted in Figure 2-2 above.[320] Firstly, a city is characterised as resilient if it has "minimal human vulnerability" and adequate service delivery, which is indicated by the level of basic needs of people that are met.[321] Secondly, a resilient city offers "diverse livelihoods and employment" opportunities. Thirdly, a resilient city is considered to have appropriate and "effective safeguards to human health and life" via its health and emergency facilities.[322] In the fourth instance, there is an observable collective identity and community structures and participation.[323] Furthermore, the fifth characteristic of a resilient city relates to sufficient law enforcement, crime prevention and the rule of law. The sixth characteristic pertains to a sustainable economy, meaning that there is sound financial management, diverse revenue supply, and investment.[324] A resilient city is also considered to have reduced exposure and fragility to stresses and shocks as a result of good land use planning and infrastructure. The effective provisioning of crucial services through ecosystems and infrastructure is also one of the characteristics of a resilient city.[325] The ninth characteristic of a resilient city is considered to be affordable yet reliable communication and mobility through multi-modal transport systems such as bus rapid transit (BRT) systems and low-carbon alternatives, as well as ICT networks.[326] The tenth characteristic pertains to effective

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318 Climate change can ultimately lead to an increase in the occurrence or severity of climate-related disasters, as already explained. Temmer, Smith and Terton *Building a Climate-Resilient City: Disaster Preparedness and Management* 1-11.

319 See para 2.3 below.

320 See Figure 2-2 above.

321 The Rockefeller Foundation and Arup *City Resilience Framework* 7.

322 The Rockefeller Foundation and Arup *City Resilience Framework* 7.

323 The Rockefeller Foundation and Arup *City Resilience Framework* 7.

324 The Rockefeller Foundation and Arup *City Resilience Framework* 7.

325 The Rockefeller Foundation and Arup *City Resilience Framework* 7.

326 The Rockefeller Foundation and Arup *City Resilience Framework* 7.

leadership and management of the city, as well as evidence-based decision-making.[327] Following from this, a resilient city also has to have empowered stakeholders with access to knowledge and participation platforms in order to take appropriate action and contribute in a meaningful way to the decisions taken by government.[328] The last characteristic is one very familiar to urban law and spatial planning, and land use management in many cities. This characteristic is integrated developmental planning through a city's vision and development strategy and plans (such as IDPs that are used by city governments).[329] Similar to the City Resilience Index depicted in Figure 2-2, this framework postulates many of the common and generalisable elements and characteristics of a resilient city that are also prevalent in literature. Accordingly, many of these characteristics are used in the discussion on the general features of urban climate resilience below.[330]

2.2.4.3.3 City Resilience Action Planning Tool (CityRAP)

This urban resilience action tool, developed by UN-Habitat in 2018, is aimed at enabling local government and city authorities in small and medium-sized or intermediate cities in sub-Saharan Africa to understand and plan actions geared toward building urban resilience and reducing urban risk and vulnerability in their cities.[331] The eventual desired outcome is for local governments and other institutions to mainstream resilience into existing and forthcoming policies, plans, budgets, and institutional frameworks. It is specifically targeted at local governments with limited experience in risk reduction and resilience planning and is designed so local governments can easily adapt and implement it with little external intervention.[332] This capacity-enhancing tool is also focused on bottom-up planning to ensure that stakeholders are adequately engaged in the planning processes.[333]

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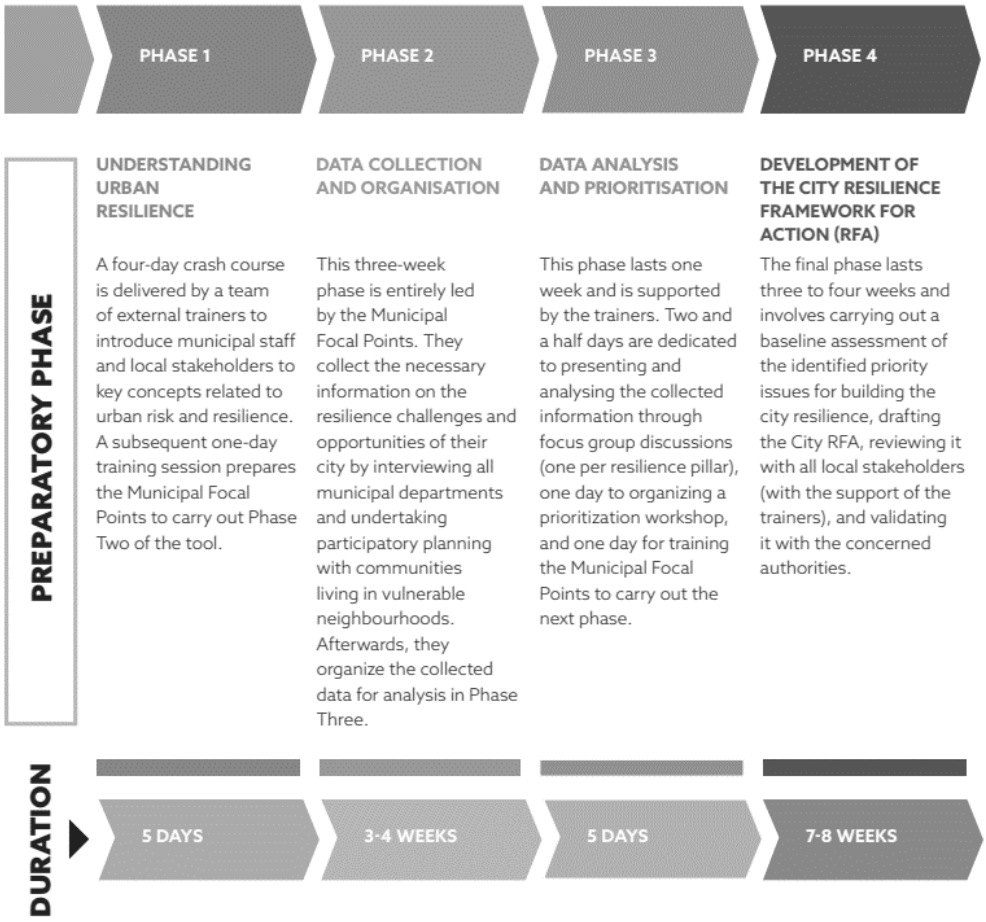
327 The Rockefeller Foundation and Arup *City Resilience Framework* 7.
328 The Rockefeller Foundation and Arup *City Resilience Framework* 7.
329 The Rockefeller Foundation and Arup *City Resilience Framework* 7.
330 See para 2.3 below.
331 UN-Habitat *CityRAP Tool* 6.
332 UN-Habitat *CityRAP Tool* 6.
333 UN-Habitat *CityRAP Tool* 7.

Figure 2-3: An overview of the CityRAP tool[334]



This tool is relevant in that it shows that there are existing mechanisms for capacity building for cities, and more specifically local governments, that they may use to strengthen resilience in their urban spaces, and much of this responsibility lies with the institutional and agent parts of the model suggested. However, this tool and the implementation thereof require a basic knowledge of what urban resilience entails. The tool sets out five resilience pillars on which the tool is focused, and these include urban governance,[335] urban planning and environment,[336] resilient infrastructure and

334 UN-Habitat *CityRAP Tool* 6.

335 Urban governance, in this tool, denotes the "processes and structures" for improved planning, management and development and considers the relationships between local government and communities as well as the adequacy of institutions such as legal, administrative and operational frameworks. See UN-Habitat *CityRAP Tool* 9.

336 Urban planning and environment speak to the planning and design aspects of the natural environment in the urban space. See UN-Habitat *CityRAP Tool* 9.

basic services,[337] urban economy and society,[338] and lastly, urban disaster and risk management.[339] If this tool is used in conjunction with the previous models (the City Resilience Index and Framework), it emerges that these pillars and the contents underlying each are intricately connected to and overlap with the elements identified through the models above. As a result, these pillars also support the argument for generalisable elements as set out below.

Figure 2-4**:** **The five resilience pillars of the CityRAP Tool**[340]

2.2.4.3.4 United Nations Office for Disaster Risk Reduction's (UNDRR) City Resilience Scorecard

This scorecard goes hand-in-hand with the Sendai Framework for Disaster Risk Reduction: 2015-2030 and enables local governments to assess their disaster resilience through monitoring and reviewing the progress and challenges in the

337 Resilient infrastructure and basic services, as used in the CityRAP Tool, refer mainly to the built environment and its ability and capacity to provide services on which the city's function is reliant. See UN-Habitat *CityRAP Tool* 9.

338 The urban economy and society pillar refers to the processes and activities that support the socio-economic growth and development of the urban space. See UN-Habitat *CityRAP Tool* 9.

339 The pillar of urban risk and disaster management is in the context of this study, particularly important as it refers to the "ability of local government and communities" (i.e., the agents), the existing institutions and systems to "prevent, anticipate, respond to, and recover rapidly" from stressors and disruptions. UN-Habitat *CityRAP Tool* 9.

340 UN-Habitat *CityRAP Tool* 9.

implementation of this framework.[341] This scorecard is structured around the UNDRR Ten Essentials for Making Cities Resilient, which include organising for disaster resilience; identifying, understanding, and using current and future risk scenarios; strengthening financial capacity for resilience; pursuing resilient urban development and design; safeguarding natural buffers to enhance the protective functions offered by natural ecosystems; strengthening institutional capacity for resilience; understanding and strengthening societal capacity for resilience; increasing infrastructure resilience; ensuring effective preparedness and disaster responses; and expediting recovery and building back better approaches.[342] The ten essentials are included here as they effectively form the cornerstone of the general features of urban climate resilience below and support the recommendations regarding the actions needed to achieve such resilience, as reflected on later in this study.[343]

2.2.4.3.5 UN-Habitat City Resilience Profiling Tool

As a culmination of the UN-Habitat's City Resilience Profiling Programme (CRPP), the CPRT was created for the purpose of engaging local-level partners and stakeholders in a comprehensive approach to building city resilience. This tool includes diagnostic capabilities for resilience-based urban development, a framework for data collection, identification of shortcomings and possible opportunities related to city infrastructure, structure and functionality.[344] This tool can be used by local governments in partnership with UN-Habitat to increase resilience in their urban areas and is based on a self-evaluation of the city's priority focus areas and possible measures for addressing these areas. It involves participation in an entire programme that includes training, data collection and a diagnosis stage where the city shares information regarding its historical and spatial contexts, its type of administration or governance, population and demographics, its economy and livelihoods, and importantly, the hazards and challenges in that area.

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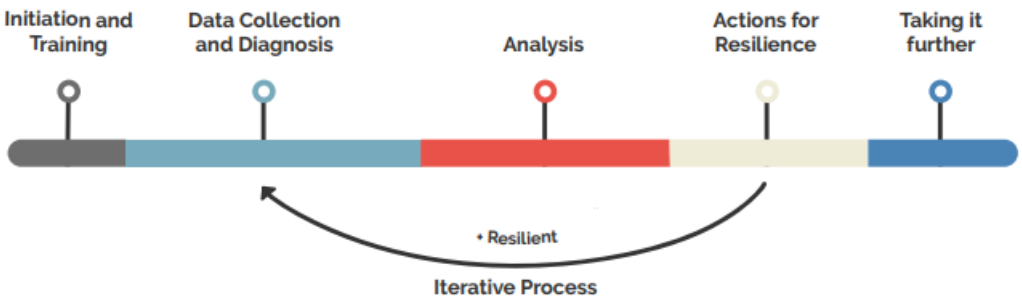
341 UNDRR 2017 https://www.undrr.org/publication/disaster-resilience-scorecard-cities.
342 UNDRR date unknown https://mcr2030.undrr.org/ten-essentials-making-cities-resilient.
343 See para 2.3 below.
344 UN-Habitat 2018 https://unhabitat.org/sites/default/files/2021/01/crpt-guide.pdf.

Figure 2-5: City Resilience Profiling Tool Implementation Process[345]



The tool can be used to assist in the analysis of the data to create a vulnerability profile and help the city identify priority areas that need to be addressed for improved resilience. This is followed by an action planning phase on what needs to be done, how and when, as well as the implementation of the necessary measures. Some of the measures mentioned in the guideline document for using this tool include regulatory or policy interventions and establishment. This tool warrants inclusion in this discussion as it is one of the possible measures that cities can use to determine their urban climate resilience if it is identified as a priority area during the diagnosis stage of this process. Cities are more likely to prioritise actions geared toward urban climate resilience if they are adequately equipped and informed of such tools at their disposal.

2.3 A categorical understanding of urban climate resilience

To distil definitive features of urban climate resilience for the purposes of this study, a wide range of published typologies was considered, including those discussed above.[346] They do not constitute an exhaustive list and stem mainly from the prevalent academic discourse within the disaster risk, climate change, and urban planning fields of study.

In line with the argument by Ahern[347] that "resilience must be based on and informed by environmental, ecological, social and economic drivers" and integrated across

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345 UN-Habitat 2018 https://unhabitat.org/sites/default/files/2021/01/crpt-guide.pdf.
346 See para 2.2.4.3 above.
347 Ahern 2011 *Landscape and Urban Planning* 342.

different scales,[348] the typology used in this study is largely derived from the embedded spheres model proposed by Du Plessis and Nel[349] on local environmental sustainability and the role of local government in that discourse.

For purposes of this study, the model has been altered to suit the context of urban climate resilience. Although urban resilience and sustainability are closely related concepts, they focus on different facets of management and adaptation. On the one hand, sustainability is aimed at securing and meeting the needs of the current generation without compromising the ability of future generations to meet their needs, and focuses further on the long-term balance of often conflicting interests of economic growth, social equity and environmental conservation.[350] On the other hand, resilience, as stated above, relates to the capability of systems to recover from, adapt to and withstand any disturbances, including natural disasters and economic or social crises.[351] It is evident that both sustainability and resilience overlap in areas pertaining to environmental and socio-economic aspects. It may even be argued that one cannot be achieved without the other and *vice versa,* as these concepts share common goals. One such goal is development that is sustainable and inclusive of "integrated social, economic, environmental, spatial, infrastructural, institutional, organisational and human resources upliftment of a community."[352] Furthermore, city authorities have similar duties for both ensuring sustainable development and urban resilience. Some of these duties include, for example, improvement of the quality of life of its communities, minimising risk of environmental harm and human health and well-being while maximising the benefits, and incorporating considerations of economic, social and environmental factors into planning, implementation and decision-making processes.[353] The sustainability model used by Nel and Du Plessis is, therefore, appropriate in the

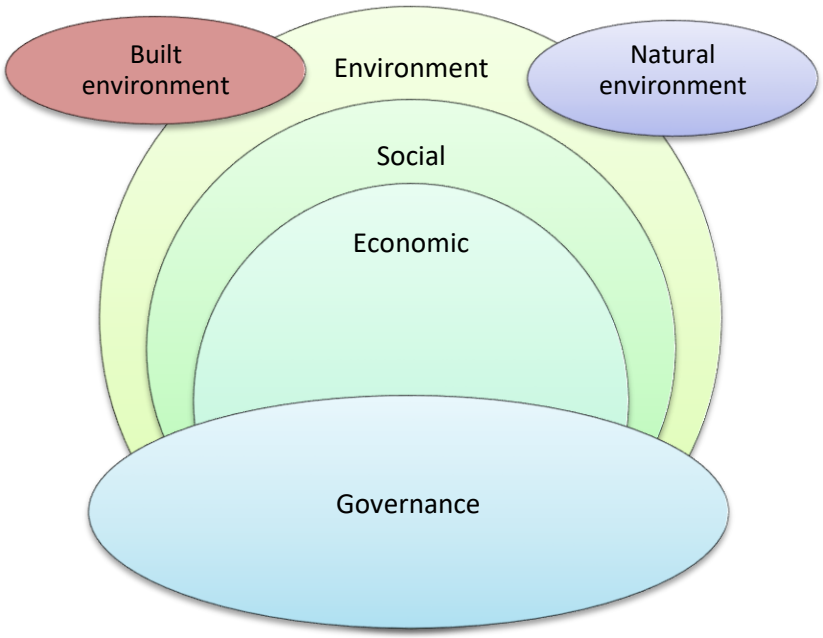
348 See also Pickett, Cadenasso and Grove 2004 *Landscape and Urban Planning* 380.
349 Du Plessis and Nel "An Introduction" 1-11.
350 See Du Plessis and Nel "An Introduction" 1-9.
351 See para 2.2.1 above.
352 See s 1 of the MSA.
353 See Du Plessis and Nel "An Introduction" 1-8 - 1-10, and 1-12.

context of this study due to the alignment and overlaps of the components of both sustainability and resilience.

In this study, the proposed typology is represented in a categorical description of urban climate resilience, as depicted in Figure 2-6 below, and consists also of embedded spheres, as in the model, but distinguishes between the natural and built environment in the environment sphere. In the model proposed by Du Plessis and Nel, it is argued that sustainability requires the economic sphere to be embedded in the social sphere, which is embedded in the environmental sphere and that all these spheres, embedded as they are, should be supported and maintained by government. In this study, however, "government" is replaced with "governance" as the basis on which the other spheres rely. Governance is used in this model as it is more encompassing than "government" and refers to more than just the agents (the structure of government including the actors responsible for ensuring the laws and rules are implemented and enforced) and institutions (the laws and rules by which a state is ruled) that is presupposed by use of the term "government" in the strict sense.[354] Governance is also more widely interpretable because it does not only speak to the act of governing but also includes governance as a structure (which are the formal and informal institutions), process (indicating the dynamics and functions involved in the governing process), mechanism (the institutional procedures of decision-making, compliance and control), and strategy (the actors' governing efforts to influence behaviour and choices).[355]

[354] Levi-Faur "From 'Big Government' to 'Big Governance'?" 3-8.
[355] Levi-Faur "From 'Big Government' to 'Big Governance'?" 8.

Figure 2-6: Typology for urban climate resilience[356]



The adapted embedded spheres model in Figure 2-6 is suggested as the typology best suited for this study, and for understanding urban climate resilience, as it encompasses a categorical description containing many of the aspects in cities that affect climate resilience. Furthermore, this model is also useful in this instance as the aspects indicated here overlap and align with the dimensions of resilience as identified by Chen *et al*, as mentioned earlier,[357] namely physical and natural dimensions (which in the adapted model will make up the "environment", economic dimension, social dimension, and, lastly, the institutional dimension (which in the adapted model will constitute "governance"). It is proposed that this model adequately depicts the relational embeddedness, interrelatedness and interdependencies of these sectors and, as will be elaborated upon further down, many of the identified features fit into one or more of the spheres of this model. Moreover, the relevance of this model as adapted for and used in the context of this study to urban climate resilience is also found in the approaches by Desouza and

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356 This model has been adapted from the one by Du Plessis and Nel "An Introduction" 1-11 – 1-15.

357 See 2.2.4.2 above.

Flanery, Tyler and Moench, and Godschalk.[358] Their differentiation between "systems, agents, and institutions" can also be applied to the model at hand, as illustrated in Figure 2-7.

Figure 2-7: Adapted spheres model depicting link to systems, agents and institutions[359]

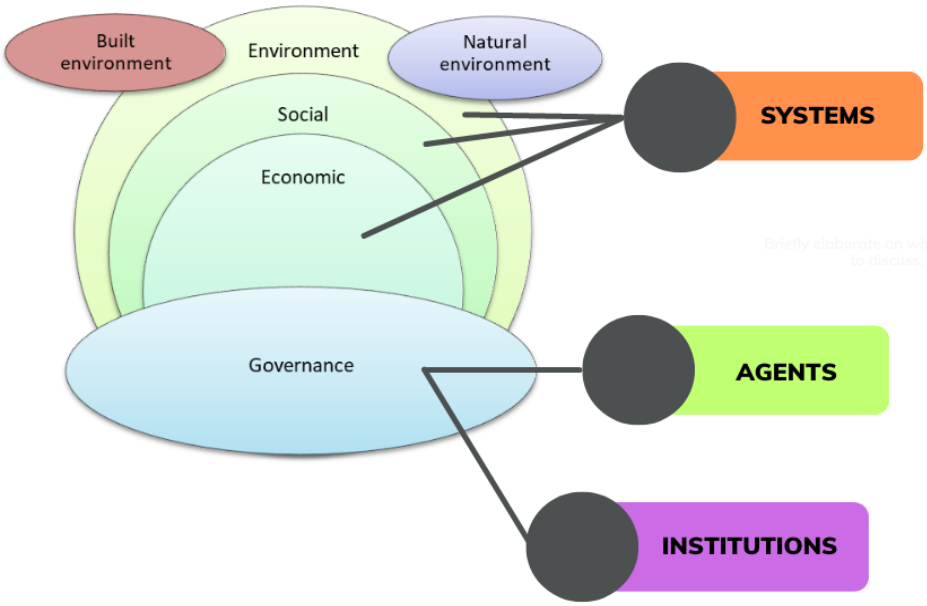

Figure 2-7 illustrates the adapted spheres model used by Du Plessis and Nel as adjusted for the purposes of this study, and in this instance shows the relation of the different spheres to the components that influence the resilience of a city as theorised by Desouza and Flanery, Tyler and Moench, and Godschalk.[360] In this depiction, the systems referred to by these scholars are considered to include the economic, social, and environmental spheres of Du Plessis and Nel's spheres model,

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358 See para 2.2.4.2 above, see Figure 2-1 above.

359 See Du Plessis and Nel "An Introduction" 1-11 – 1-15; Tyler and Moench 2012 *Climate and Development* 313-314.

360 See Desouza and Flanery 2013 *Cities* 91; Tyler and Moench 2012 *Climate and Development* 313-314; Godschalk 2003 *Natural Hazards Review* 136-137.

while the agents and institutions are both considered to refer to the governance sphere.[361] This model will also be used and further adapted for illustrative purposes as the discussion in this chapter develops.

2.3.1 Economic sphere

As a departure point, this model shows that the economic sphere is dependent on both the social and environmental spheres for services and communities in cities, as well as resources and ecosystem services for its sustained continuation, growth, and development.[362] Service delivery is seen as an enabling condition for development, and it can be argued that it enables economic development.[363] In this sphere, aspects that influence resilience include, for example, sustained economic investments, along with growth in the green economy, rates and taxes, surcharges, the prices of commodities, trade and local economic development.[364]

The general features under the auspices of the economic sphere include a sustainable local economy, diverse livelihoods and employment opportunities, and increased financial capacity.

2.3.1.1 Diverse livelihood and employment opportunities]

The increased number of people living in the city area creates the need for more employment and other opportunities.[365] Investment follows opportunity. Many towns and cities were formed close to economic assets such as mines and sites for tourism, for example. Urban growth helps to stimulate the local economy by creating jobs and bringing in capital for the city and country.[366] These opportunities are often realised through foreign investors.[367]

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361 See para 2.3 below.
362 Du Plessis and Nel "An Introduction 1-11.
363 Turok 2014 *Environment and Planning A* 3.
364 See McCullough *Building a Climate-Resilient City: Economics and Finance* 6-7.
365 Frey and Zimmer "Defining the City" 14-15.
366 Turok and McGranahan 2013 *Environment and Urbanization* 465-466.
367 See Sheng 2011 *International Journal of Tourism Research* 32.

As stated earlier, cities are considered economic hubs and are rife with employment opportunities and chances for a better life. In the "utopian" city, there would be no unemployment, exacerbating other socio-economic issues for city dwellers, such as poverty, access to food and water, access to adequate housing, or even, in many cases, sanitation facilities. This translates into a need for diverse livelihood and employment opportunities. The urban economy depends on processes that allow cities to drive socio-economic growth.[368] The socio-economic growth of a city is realised by job creation, increased income per household through income-generating opportunities, generating investments, and improving the financial capacity and resilience of a city.[369] Furthermore, the opportunities should be diverse and of such a nature that include both skilled (trained) and unskilled labour and ensure the empowerment of vulnerable groups, such as women and people with disabilities.[370] This inherently means that income inequality will also have to be addressed.[371]

For the labour markets to thrive and contribute to the socio-economic growth of a city, the potential employees must be employable and have sufficient work experience and education to ensure an effective labour supply.[372] A lack of employment opportunities and severe unemployment rates, in many instances, mean that local economies suffer, due to the limited number of households that derive their main source of income from employment and a resulting over-reliance on social grants.[373] This also implies that economic growth trajectories, labour markets, and the availability of jobs must keep pace with the expanding workforce, especially as far as they concern the employment of the youth and other underrepresented or vulnerable groups.[374] There is also a drive for such employment and livelihood opportunities to be created in "resilient" sectors, and the need for

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368 UN-Habitat *CitytRAP Tool* 9.
369 UN-Habitat *CityRAP Tool* 15.
370 UN-Habitat *CityRAP Tool* 15; Martin *Building Resilience through Greater Adaptability to Long-term Challenges* 15.
371 Turok 2014 *Environment and Planning A* 754.
372 Turok 2014 *Environment and Planning A* 754.
373 Turok 2014 *Environment and Planning A* 754.
374 Martin *Building Resilience through Greater Adaptability to Long-term Challenges* 18-20; Turok 2014 *Environment and Planning A* 754.

such opportunities to create adaptive and resilient citizens that can withstand, adapt to, recover from and bounce back after economic instability, whether related to climate change-related disasters or not.

In terms of livelihood opportunities, and perhaps related to the social sphere discussed below, cities need to be able to accommodate the influx of people seeking employment opportunities through adequate housing and basic services. Moreover, cities seeking economic prosperity, a break in structural poverty, and resilience will need to ensure that people in the city area retain their health and well-being and have reduced vulnerability and risk exposure. They can achieve this by ensuring adequate and accessible livelihood infrastructure in city areas, which ensures sustained service delivery, low crime levels, safety and security of persons and businesses, and mobility.[375] Infrastructure upkeep is also important, as it affects how people from outside the city view it and are willing to engage with the market forces and local economy.[376] Such upkeep may also attract investment opportunities that will lead to the enhanced financial capacity of a city through commerce and trade.[377]

2.3.1.2 Increased financial capacity

As climate-related disasters increase in both frequency and intensity, cities will require more finances in order to restore services and rebuild their local economies.[378] The implementation of appropriate economic mechanisms is imperative for cities to effectively manage and reduce the adverse effects of economic shocks.[379] Enhanced financial capabilities require cities to possess a robust fiscal position and well-managed public finances that enable them to use

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375 See Knox-Mosdell 2022 *PELJ* 14; Howe, Ngwerume and Muchemwa 2013 *Stability* 9-12; Mboup and Oyelaran-Oyeyinka "Relevance of Smart Economy in Smart Cities in Africa" 5; Olokesusi and Aiyegbajeje "Smart Disaster Prevention and Resilience in Africa" 317-320; Kasim, Wahab and Olayide "Assessing Urban Liveability in Africa: Challenges and Interventions" 2; Revi and Rosenzweig *The Urban Opportunity: Enabling Transformative and Sustainable Development* 4.

376 Arimah 2017 *Procedia Engineering* 246; Allam, Jones and Thondoo *Cities and Climate Change: Climate Policy, Economic Resilience and Urban Sustainability* 85.

377 Arimah 2017 *Procedia Engineering* 246.

378 Temmer, Smith and Terton *Building a Climate-resilient City: Disaster Preparedness and Emergency Management* 4.

379 UN-Habitat *Urban Resilience Profiling Tool* 43.

supplementary expenditure or exercise fiscal constraint strategically.[380] This approach serves the purpose of alleviating economic strains and mitigating unforeseen (economic and other) shocks, thereby facilitating expeditious economic recovery.

Increased financial capacity, therefore, requires cities to have diverse revenue streams from both private and public sources.[381] Some of the capital coming from local economic activities ends up in state coffers due to levies, rates for services, taxes on goods, fines, as well as surcharges from things such as licenses and other government administrative functions where the payment of a fee is required for the rendering of a particular service.[382] Furthermore, increased financial capacity stems from having an attractive business and local economic environment that attracts investment and is integrated with global economic systems.[383] The promotion of sustainable businesses and industries, accompanied by support for small and medium-sized enterprises (SMEs), significantly contributes to the increase of a city's financial capacity.[384]

The economy is the sphere in which city budgets and finances can be grown for investment in infrastructure that could potentially make the city more resilient, stimulate innovation, facilitate the protection and restoration of ecosystems, and enable improved service delivery, among others.[385] Investments in innovative, modernised, green, low-carbon, renewable and resilient technologies and infrastructure, such as flood warning systems, water management systems, and other systems that enable municipalities to take targeted actions against the impacts of climate change, will improve resilience to climate-related disasters.[386] The need

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380 UN-Habitat *Urban Resilience Profiling Tool* 43.

381 The Rockefeller Foundation and Arup *City Resilience Index* 21; Martin *Building Resilience through Greater Adaptability to Long-term Challenges* 15-16.

382 See Field "Local Economic Development and the Pursuit of a Green Economy" 5-6 – 5-7, 5-26; McCullough *Building a Climate-Resilient City: Economics and Finance* 6-7.

383 The Rockefeller Foundation and Arup *City Resilience Index* 21.

384 Burch *et al* 2022 *Urban Transformations* 2.

385 Pichola, Kelkar and Bratek *Building Climate-resilient Cities: Exploring the Five Lenses of Climate Action* 12.

386 Pichola, Kelkar and Bratek *Building Climate-resilient Cities: Exploring the Five Lenses of Climate Action* 7; Venema and Temmer *Building a Climate-resilient City: Electricity and Information and Communication Technology Infrastructure* 2-3.

for these types of investments has led to a rise in the establishment of green and climate bonds as an external funding mechanism for governments to foster climate action and enhance urban climate resilience.[387] Control of certain resources (such as fiscal investments and funding for projects) also notably lies at the local government level in cities. This means that poor use and maintenance of these resources stand to negatively affect not only the local but also the national economy, if these funds are misused and investments are subsequently withdrawn or more funding is required from the national fiscus.[388]

2.3.1.3 Sustainable local economy

A sustainable local economy inherently includes sustainable urban development, which should be "low [in] emissions, nature-based, resilient, circular and equitable"[389] and be inclusive of consideration of social, economic and environmental aspects. Local economic development results in improved socio-economic conditions.[390]

Damage to infrastructure and adverse health effects that are part and parcel of climate-related disasters have large financial implications for cities and affect investor confidence and credit ratings.[391] As such, this feature is dependent on improving municipal governance and system infrastructure to increase funding and budgeting opportunities for green finance and improvements for climate resilience at the city- (street) level.[392] This indicates clear linkages between disastrous events and the local economy of a city, as well as the latter's financial capacity and well-

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387 See Banga 2019 *Journal of Sustainable Finance & Investment* 18; Clapp *et al Green Bonds and Environmental Integrity: Insights from CICERO Second Opinions* 1; Saha and D'Almeida "Green Municipal Bonds" 98-99; Aggarwal and Pathak 2021 *Journal of Contemporary Issues in Business and Government* 2633; Bracking and Leffel 2021 *WIREs Clim Change* 2.

388 Field "Local Economic Development and Pursuit of a Green Economy" 5-22.

389 ICLEI *Call for Inputs by the Standing Committee on Finance in the Organisation of its Next Forum* 4.

390 Lee 2019 *Law and Development Review* 745.

391 McCullough *Building a Climate-Resilient City: Economics and Finance* 1-2.

392 See Asian Development Bank *Urban Climate Change Resilience* 17, 19; McCullough *Building a Climate-resilient City: Economics and Finance* 5, 9; Terton *Building a Climate-resilient City: Urban Ecosystems* 5-6.

being. It is suggested that regulatory and financial instruments (such as zoning, taxation and user fees) have the potential to cultivate adaptive resilience.[393]

In addition, local agriculture and farming are also important sectors within the local economy as they provide crops and livestock to the communities in their areas and, in some cases, export and trade in their goods. This stands to improve food security and, indirectly, the livelihoods of people in the city. However, in cases of extreme weather events, food production and distribution are severely under threat and may cause a deficit in meeting the market demand. Higher demand leads to price hikes and causes people to buy less, as they cannot afford the higher prices. This is the same phenomenon that causes inflation to occur and interest rates to increase.[394]

Cities should also aim for cost-effective responses to climate change, and to build resilience and adopt timely and efficient adaptation measures to preclude more damage and excessive cost implications after the fact, i.e., they should invest in preventative measures rather than reactive and delayed approaches.[395] This, in effect, also means that city budgets (operational and capital) should take into consideration the financial implications of building urban climate resilience. Additionally, and related to the discussion on increased financial capacity above,[396] support for SMEs is pertinent for sustained local economic resilience. By fostering sustainable business practices and facilitating the growth of SMEs, cities can establish a resilient economic environment that not only enhances the overall economic vitality of the city but also strengthens its ability to withstand and recover from economic and other disruptions.[397] Sustainable businesses, characterised by their commitment to minimising environmental impact and prioritising social welfare, generate long-term value and promote economic stability. Furthermore, by supporting SMEs, cities foster entrepreneurship, innovation, and employment

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393 McCullough *Building a Climate-Resilient City: Economics and Finance* 1-2.

394 See Ogege 2019 *International Journal of Commerce and Finance* 121; Taghizadeh-Hesary, Rasoulinezhad and Yoshino 2019 *Energy Policy* 796-797; Alola, Yalçiner and Alola 2019 *Environmental Science and Pollution Research* 34449.

395 McCullough *Building a Climate-Resilient City: Economics and Finance* 2.

396 See para 2.3.1.2 above.

397 Burch *et al* 2022 *Urban Transformations* 3.

opportunities, fostering a diverse economic landscape. The cumulative effect of these strategies is a city that possesses the necessary resources and resilience to navigate economic challenges, spur growth, and advance national and local sustainable development objectives. As such, it is also important that climate resilience be integrated into a city's long-term development planning.

2.3.2 Social sphere

As stated above, the social sphere is interdependent on the environmental sphere and the economic sphere. The social sphere encompasses a wide range of socio-economic factors and has a particular focus on basic service delivery, community health and well-being, and community participation.

This sphere touches on an array of matters at the heart of human rights (at least in the South African context), such as access to sufficient food and water,[398] access to adequate housing,[399] and the right to an environment not harmful to health and well-being.[400] The latter postulates the interdependencies between the different spheres in the model depicted in Figure 2-6 above. In the social sphere, however, challenges such as unemployment, poverty, inequality, inadequate housing and living environments, and their accompanying informality threaten the resilience of the cities in which these challenges are prevalent.[401] Higher population densities, as found in cities, mean higher consumption, demand and use of resources by the communities within the relevant city and, in the event of an extreme weather occurrence, by those displaced by these events in other cities. In addition, higher population densities are the cause of more severe environmental impacts and higher demands for basic services, housing, energy consumption, unemployment, and inequality. The features encapsulated under the social sphere relate to adequate

398 See s 27 of the Constitution.
399 Section 26 of the Constitution.
400 Section 24 of the Constitution.
401 See Martin-Moreau and Ménascé 2018 *FACTS Reports* 9; Da Silva, Kernaghan and Luque 2012 *International Journal of Urban Sustainable Development* 127-128.

service delivery, health and emergency facilities, community structures and participation, and access to information and knowledge and participation platforms.

2.3.2.1 Adequate service delivery

As elucidated above, climate change and its related challenges have a severe impact on municipal systems such as water resources, service delivery capability and capacity, finances, as well as other important city infrastructure that fosters resilience, especially to climate vulnerability.[402] Adequate service delivery speaks to the adequate provision of basic services as provided for in human rights and other legislation, as well as international standards. It pertains to services such as water and sanitation, waste collection and disposal, environmental health services, cleansing, etc.

Water and sanitation services are particularly important to human health and well-being. Moreover, it is important that access to water for personal and domestic use is sufficient, safe, acceptable, and affordable.[403] The right to sanitation services includes that they be physically and affordably accessible, and requires such sanitation to be provided in a manner that is safe, hygienic, secure, socially and culturally suitable, and private in order to ensure human dignity.[404] Unsafe, contaminated and unhygienic water and sanitation services may carry water-borne and vector-borne diseases, such as cholera and malaria, that directly threaten health and well-being and, as such, also affect the resilience of communities to other disasters and stressors caused by climate change.[405] Water is also a very important ingredient for the production and delivery of food, energy, sanitation, and other goods and services that people depend on.[406] The human right to water and

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402 See Venema and Temmer *Building a Climate-resilient City: Water Supply and Sanitation Systems* 2-3; Temmer, Smith and Terton *Building a Climate-resilient City: Disaster Preparedness and Emergency Management* 4.

403 UN Water date unknown https://www.unwater.org/water-facts/human-rights-water-and-sanitation.

404 UN Water date unknown https://www.unwater.org/water-facts/human-rights-water-and-sanitation.

405 Diedericks *Municipal Regulation of Communicable and Vector-borne Disease Control in terms of South African Law* 14-15.

406 UN Water *Summary Progress Update 2021: SDG 6 — Water and Sanitation for All* 4.

sanitation was recognised internationally as such in 2010,[407] yet this right is still evasive in many countries, and around one out of four individuals globally are reportedly without access to safe drinking water, and almost half the global population lacks adequate sanitation services.[408]

Water is, alarmingly, also becoming a scarce resource, as water sources are drying up due to increased droughts and irregular rainfall caused by climate change.[409] As discussed below, land and ecosystems that provide ecosystem services needed for clean water provision are also under severe pressure and threat due to climate change and unsustainable resource use. Furthermore, water-intensive industries are growing to meet the needs of growing populations and the increased demand that accompanies them.[410] Disasters such as droughts also intensify the possibility of other disasters such as wild-fires, soil erosion, water and food insecurity, famine, and health-related issues due to lack of nutrition and exposure to limited and often contaminated water sources and unhygienic and polluted environments. Some suggested solutions that may contribute to increased water security and urban climate resilience include improving carbon storage (through restoration and conservation of wetlands and forests), protecting natural buffers (that act as barriers to flooding, extreme weather events, and erosion, for example), rainwater and run-off water management (through water aquifers and storage), adopting climate-smart agriculture, reusing wastewater, and protecting groundwater resources and encouraging sustainable water use.[411]

To provide for food security,[412] there is a need for agriculture and farming to provide produce for human consumption. However, these practices are also considered to

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407 *Resolution adopted by the General Assembly* on 28 July 2010 A/RES/64/292 (2010) 2; Office of the High Commissioner for Human Rights *General Comment No. 15: The Right to Water* (Arts 11 and 12 of the Covenant) E/C12/2002/11 (2003) 1-3.

408 UN Water 2021 https://www.unwater.org/publications/who/unicef-joint-monitoring-program-water-supply-sanitation-and-hygiene-jmp-progress-0.

409 UN date unknown https://www.un.org/en/climatechange/science/climate-issues/water.

410 UN Water *Summary Progress Update 2021: SDG 6 — Water and Sanitation for All* 1.

411 UN Water date unknown https://www.unwater.org/water-facts/water-and-climate-change.

412 Food security (and the associated "right to adequate food") refers to having consistent physical and economic access to sufficient, safe, and nutritious food that meets individuals' dietary needs and cultural preferences, in ways that are sustainable and do not compromise other human rights. See World Bank 2025 https://www.worldbank.org/en/topic/agriculture/brief/food-

contribute to GHG emissions and aggravate climate change.[413] The ability to provide these ecosystem services is also affected by the impacts of climate change and the concomitant extreme weather events such as droughts, which cause a reduction in water necessary to grow crops, resulting in reduced crop yield, or extreme rainfall, rendering delays in harvesting times and crop loss due to rot and decay of crops.[414] This may affect food prices and limit exports of produce, significantly impacting the economy and highlighting inequality and disparities in cities.

In this discussion, it is necessary to also consider waste management services, as pollution and contamination of water sources and the environment have large socio-economic impacts and affect not only the delivery of basic services but also the health and well-being of citizens, economic development, socio-economic inequalities and other aspects of urban ecosystems.[415] Solid waste makes a large contribution to GHG emissions due to inadequate waste management systems, unregulated dumping, decomposition of organic waste, and open dumpsites.[416] Furthermore, solid waste often results in contaminated water as it enters rivers, groundwater sources and soil.[417] Waste management that is conscious of urban climate resilience is needed to address the negative impact of mismanaged waste that can exacerbate flooding if waterways are blocked, cause and spread water and vector-borne diseases, result in air pollution and severely impact health and well-being in cities by causing respiratory illness.[418] Urban spaces face acute waste generation and pollution due to the over-reliance on heavily packaged products, which increases the amount of household waste discarded.[419] Another factor that

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security-update/what-is-food-security; Economic and Social Council *General Comment 12 (Twentieth session, 1999) The right to adequate food (Art 11)* E/C12/1999/5 (1999) 3.

413 Lynch *et al* 2021 *Front. Sustain. Food Syst.* 2; UN News 2021 https://news.un.org/en/story/2021/11/1105172; The World Bank 2021 https://www.worldbank.org/en/news/feature/2021/09/22/needed-a-climate-smart-food-system-that-can-feed-10-billion.

414 Temmer *Building a Climate-resilient City: Agriculture and Food Security* 2.

415 Resilient Cities Network 2021 https://tinyurl.com/fdazves4.

416 UN-Habitat 2021 https://unhabitat.org/news/22-mar-2021/climate-change-circular-economy-waste-management.

417 UN-Habitat 2021 https://unhabitat.org/news/22-mar-2021/climate-change-circular-economy-waste-management.

418 Gutberlet "Waste in the City: Challenges and Opportunities for Urban Agglomerations" 195.

419 Gutberlet "Waste in the City: Challenges and Opportunities for Urban Agglomerations" 193.

contributes to urban waste is the increasing demand for readily available resources from within and outside the city areas.[420] This requires an elaborate supply chain system and can be carbon-intensive throughout the different stages in the supply chain, from production to the consumer stages.

Adequate housing[421] may, in some instances, also fall within the service delivery mandate of governments and create service delivery expectations, especially as some of these services constitute basic human rights. Adequate housing indirectly impacts health and well-being as there are several safety, environmental and risk concerns where housing is inadequate. Adequate housing is also argued to go hand-in-hand with adequate service delivery in the form of access to adequate water and sanitation, waste management, and a safe and healthy environment. Adequate housing is considered to require security of tenure,[422] availability of services, materials, facilities and infrastructure (including energy infrastructure),[423] affordability,[424] habitability,[425] accessibility,[426] location,[427] and cultural adequacy.[428]

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420 Gutberlet "Waste in the City: Challenges and Opportunities for Urban Agglomerations" 193.

421 Adequate housing encompasses the right to live somewhere in security, peace and dignity. Furthermore, adequate housing requires housing to be available to all persons irrespective of income or access to economic resources. Moreover, the "adequacy" envisioned here pertains to adequate privacy, space, security, lighting and ventilation, basic infrastructure, and adequate location with regard to work and basic facilities for an affordable and reasonable price. See Office of the High Commissioner for Human Rights *CESCR General Comment No 4: The Right to Adequate Housing (Art 11 (1) of the Covenant)* E/1992/23 (1992) 2.

422 Tenure security relates to a guarantee of legal protection against forced eviction, harassment and other threats. See Office of the High Commissioner for Human Rights (OHCHR) *The Right to Adequate Housing* 4.

423 The availability of services, etc., mentioned here refers to safe drinking water and adequate sanitation as discussed above; energy for cooking, heating, lighting, food storage, and refuse disposal.

424 Affordability is a difficult requirement given the commodification of housing as a commodity rather than a human right, but housing is considered inadequate if its cost compromises the realisation of other human rights. See OHCHR *The Right to Adequate Housing* 4.

425 Habitability requires housing to guarantee a degree of physical safety, provide adequate space, as well as protection against the elements and other threats to health, as well as structural hazards. See OHCHR *The Right to Adequate Housing* 4.

426 Accessibility means that housing should be inclusive and consider the needs of disadvantaged and marginalised groups. See OHCHR *The Right to Adequate Housing* 4.

427 Location is a very important aspect, as alluded to above. The location of housing needs to be in an area with employment opportunities, access to health-care services, education, and other social facilities and should be in areas that are not vulnerable or at risk of natural disasters, danger and pollution. See OHCHR *The Right to Adequate Housing* 4.

428 Cultural adequacy refers to respect for and consideration of the free expression of cultural identity. See OHCHR *The Right to Adequate Housing* 4.

Inadequate housing can have severe consequences, such as infestations causing disease, destruction of property due to natural disasters, over-crowding, which also carries health concerns, subsequent displacement or homelessness, and increased vulnerability and risk to climate-related disasters.[429] Inequality, discrimination and spatial segregation further exclude many people from access to adequate service delivery and other opportunities.[430] Furthermore, adequate housing has become a hotly debated topic in the wake of a global pandemic, which had the majority of the world isolated and confined to their homes. This meant that vulnerable groups such as women and children facing domestic abuse or gender-based violence were trapped in dangerous circumstances, freedom of movement was restricted, and many people lost their jobs and could no longer afford rent or mortgages and were threatened with eviction. Poor, homeless and vulnerable people, especially in informal settlements, were faced with extensive health issues in the confines of their overcrowded settlements with limited access to water and sanitation services.

The delivery of adequate housing is elusive in many countries, as more than 1.8 billion people globally live in informal settlements or inadequate housing.[431] On the one hand, informal settlements are often erected in areas close to employment opportunities, while on the other hand, they are often established in hazardous and polluted areas such as steep-sided hills that may be prone to landslides, flood plains, and landfill sites.[432] In many instances, informal housing does not meet formal building standards, and is often prevalent in high-risk areas prone to disasters such as flooding, while also not being connected to existing service delivery

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429 UN-Habitat *Concept Note: Housing for All: A Better Urban Future* 1. In some instances, a lack of adequate housing and rising rates of extreme poverty lead to unlawful occupation or "hijacking" of buildings without proper infrastructure and safety measures in urban areas (also known as dark buildings). An example that received national and global attention recently is the case of hijacked buildings in the inner-city of Johannesburg, where one such building burned and almost 80 occupants died in August 2023. See Mlambo 2023 https://www.iol.co.za/news/south-africa/gauteng/joburg-cbd-fire-there-are-over-50-hijacked-buildings-in-inner-city-3a6ae6bc-95e6-498f-b64a-8fffe622000e; Wilhelm-Solomon 2016 *Singapore Journal of Tropical Geography* 384-386; Wilhelm-Solomon 2021 *Environment and Planning D: Society and Space* 977.

430 See OHCHR *The Right to Adequate Housing* 10.

431 OHCHR 2023 https://www.ohchr.org/en/special-procedures/sr-housing/human-right-adequate-housing.

432 Zerbo, Delgado and González 2020 *Global Health Journal* 47.

infrastructure.[433] This translates to a lack of adequate service delivery and unsafe and sometimes illegal service connections. The lack of adequate and readily available services also increases the vulnerability and risk of informal communities, as they either have to travel far to obtain such services or make use of unsustainable and unhealthy alternatives (such as outdoor pit-latrines, getting drinking water and water for domestic use from rivers or dams that might be polluted or become polluted due to faecal matter and other pollutants ending up in water resources, illegal energy connections, burning of fossil fuels for cooking and heating which also carries great risk of domestic fires and indoor air pollution, unsanctioned landfills and excessive waste production).[434] The issues discussed have severe effects on the health and well-being of the people within informal settlements, the environment and the economy.

The systems and infrastructure that carry the provision of these services further need to remain functional and be protected against failure and disruption caused by natural or other disasters, and require maintenance and upgrading.[435] Water scarcity, waste generation and mismanagement, as well as disease and homelessness, are exacerbated if the infrastructure necessary to provide such services is not climate resilient. Resilience of infrastructure can be achieved by providing for, *inter alia*, resilient and sustainable wastewater technologies, functional and effective waste and wastewater treatment, integrating grey water waste treatment and usage, and watershed management and protection of water resources, aquifers and underground water supply systems, effective waste management systems and disposal methods with a low carbon footprint, reducing, reusing and recycling waste, and regular maintenance and upkeep of such infrastructure.[436]

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433 Zerbo, Delgado and González 2020 *Global Health Journal* 48.

434 See French *et al* "Climate Resilience in Urban Informal Settlements: Towards a Transformative Upgrading Agenda" 130-132.

435 Venema and Temmer *Building a Climate-Resilient City: Water Supply and Sanitation Systems* 3.

436 Venema and Temmer *Building a Climate-Resilient City: Water Supply and Sanitation Systems* 1-6.

The adequate service delivery envisioned here could lessen risk and vulnerability to health issues and disasters and can help lessen the impact of many of the challenges faced in urban areas, such as, *inter alia*, informal settlements, safety, inclusivity, and poverty.

2.3.2.2 Health and emergency facilities

The health and well-being of people are of fundamental concern and should be safeguarded,[437] especially in the midst of climate-related disasters. The health and well-being of people in cities can be safeguarded by providing a safe, clean and healthy environment[438] and ensuring that there are health and emergency services in the event that disaster strikes. There should also be health and safety standards in place for foodstuff, water quality, and building safety, for example.[439] Healthcare and emergency facilities deliver important services, such as the treatment of illness and injury, and are considered the first line of defence when people are harmed in natural disasters and climate-related hazards.[440] However, healthcare facilities can also have a negative impact on the environment and health in circumstances where they do not have adequate functioning infrastructure and services, such as energy supply, adequate water, sanitation, and waste management, due to large amounts

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437 See Office of the High Commissioner for Human Rights *CESCR General Comment No 14: The Right to the Highest Attainable Standard of Health (Art 12)* E/C12/2000/4 (2000) 1.

438 As will be elaborated on in para 2.3.3 below.

439 These standards also arguably play a very important part in safeguarding the health and safety of consumers and residents, particularly as far as informal trading and settlements are concerned. This recently dominated the news in South Africa, where these standards were not in place and led to the death of several children due to expired foodstuff purchased at "spaza" shops. See Presidency of the Republic of South Africa 2024 https://www.thepresidency.gov.za/address-president-cyril-ramaphosa-deaths-children-due-food-borne-illnesses-union-buildings-tshwane; Presidency of the Republic of South Africa 2024 https://www.parliament.gov.za/news/national-assembly-calls-stricter-enforcement-laws-stop-sale-expired-and-fake-food-products; Majadibodu 2024 https://www.iol.co.za/travel/south-africa/gauteng/gauteng-premier-panyaza-lesufi-announces-new-regulations-for-spaza-shops-after-23-children-died-bdd2ce2a-afb2-41a1-af38-8b95c45403ed. In terms of building safety issues, especially in urban central business districts (CBDs) where informal settlements are formed within so-called hijacked buildings that are not suitable for settlement and do not have access to the necessary amenities and basic services and are usually derelict and abandoned, and in violation of building regulations and standards, which also recently (2023) lead to the deaths of 77 people when fires broke out in these buildings, see para 2.3.2.1 above.

440 World Health Organisation (WHO) *Guidance for Climate-resilient and Environmentally Sustainable Health Care Facilities* 1; Paterson *et al* 2014 *International Journal of Environmental Research and Public Health* 13098.

of environmental waste and contamination that may be infectious or toxic.[441] In addition, climate risks compromise health infrastructure due to effects like increased urban temperatures, extreme weather events such as flooding, and outbreaks and spread of diseases.[442]

Basic health is also a climate-related concern. The effects of climate change on health are worsened in urban areas due to how the built environments in cities are often constructed and how these complex systems function.[443] Urban areas are considered conducive environments for the increased and expedited transmission of communicable and vector-borne diseases as a result of overcrowding, which results in a lowered capacity to respond to other health-related disasters and services.[444] Furthermore, vulnerable groups, especially those living in informal settlements or who are homeless, have reduced ability to cope with and recover from disasters as, in many circumstances, they do not have access to proper healthcare systems or infrastructure.[445] Social vulnerability to diseases is especially prevalent in poor communities where access to basic services such as water and sanitation, and waste management services is restricted and where adequate healthcare infrastructure is unavailable.[446]

Climate change, exacerbated by factors that modify urban spaces, amplifies existing human health concerns and threatens the ability of health systems to sustainably deal with multiple stressors in cities.[447] The effects of climate change result in health outcomes such as increased mortality rates, malnutrition, respiratory and cardio-respiratory illnesses, diarrheal diseases, asthma, allergies, and communicable and vector-borne diseases.[448] Additionally, healthcare facilities are not immune from

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441 WHO *Guidance for Climate-resilient and Environmentally Sustainable Health Care Facilities* 1.
442 Sharifi *et al* 2021 *Sustainable Cities and Society* 6.
443 Araos *et al 2016 International Journal of Health Services* 54; Sharifi *et al* 2021 *Sustainable Cities and Society* 2.
444 Diedericks *Municipal Regulation of Communicable and Vector-borne Disease Control in terms of South African Law* 13-15.
445 Da Silva, Kernaghan and Luque 2012 *International Journal of Urban Sustainable Development* 128; Pelling *et al* 2022 *Climate and Development* 621.
446 Pelling *et al* 2022 *Climate and Development* 619.
447 Rozenzweig *et al* "Urban Climate Change in Context" 9-10; Paterson *et al* 2014 *Int. J. Environ. Res. Public Health* 13098.
448 Rozenzweig *et al* "Urban Climate Change in Context" 10.

disasters such as flooding and droughts, which can cause disruptions in their ability to provide healthcare services and can threaten the health and well-being of patients being treated as well as staff members, and limit access to health services.[449] The pressure on health systems is especially severe in developing countries where infrastructure and access to health care are limited. In this vein, infrastructure maintenance and updating are also necessary for ensuring preparedness and resilience in the face of looming climate-related disasters. Where cities face service disruptions in water, electricity, etc., it is pertinent that such healthcare and emergency facilities have back-up energy sources, and water collection systems or these services need to be redirected to areas where health and emergency services are provided.[450]

In recent years, the lack of resilience and increased vulnerability of healthcare facilities have been highlighted in the midst of a global pandemic, the COVID-19virus.[451] The lack of adequate resources and workforce for healthcare facilities is a contributing factor to vulnerability, and many facilities were unable to cope with the large influx of diseased caused by the pandemic.[452] Łukasik and Porębska,[453] argued that the pandemic showed "how even a modest rise in admission volume can overwhelm a hospital beyond its functional reserve." In the event that another disaster struck, these facilities would not have been able to adequately provide healthcare services to those in need. Healthcare facilities were forced into *ad hoc* strategies to deal with the pandemic, and in that sense showed potential for flexibility and adaptability in the face of an emergency.[454] However, many healthcare facilities required urgent spatial re-organisation and alternative response mechanisms (such as the establishment of buffer areas, decontamination areas, and

449 Curtis *et al* 2017 *Environmental Health* 25.
450 See Paterson *et al* 2014 *Int. J. Environ. Res. Public Health* 13108.
451 Pelling *et al* 2022 *Climate and Development* 617.
452 Sharifi *et al* 2021 *Sustainable Cities and Society* 6; Brambilla *et al* 2021 *Int. J. Environ. Res. Public Health* 1; Angrup *et al* 2020 *Indian Journal of Medical Microbiology* 139-140.
453 Łukasik and Porębska 2022 *Int. J. Environ. Res. Public Health* 1.
454 See Capolongo *et al* 2020 *Acta Biomed* 50-51; Łukasik and Porębska 2022 *Int. J. Environ. Res. Public Health* 1.

temporary solutions to overcome the saturation of spaces).[455] In many instances, other ailments and diseases were put on the back burner to deal with the fallout of the pandemic. The pandemic also emphasised embedded inequalities and vulnerabilities in terms of gender, race, income and livelihood, in particular.[456] This is indicative of vulnerability in healthcare systems and facilities and showcases a lack of resilience in general.

Health and emergency services are related to issues pertaining to disaster preparedness and emergency management, in particular, adequate planning mechanisms for disaster (risk) management.[457] Such preparedness requires health care and emergency facilities to have access to early warning systems and undertake risk assessments in the face of climate and weather variability to ensure future preparedness for disasters.[458] This entails reliance on access to information and community structures. Adequate preparedness can increase community resilience and potentially decrease the strain put on healthcare and emergency facilities in cases of disaster.[459]

2.3.2.3 Community structures and participation platforms

Communities are the social and institutional backbone of cities. They consist of formal and informal associations functioning in urban areas and include, for example, schools, neighbourhoods, agencies, organisations, and local enterprises.[460] Communities in urban areas bear the brunt of the impacts of and challenges related to climate change, as it severely impacts their health and well-being, their livelihoods and quality of life. Bahadur and Tanner[461] emphasise the importance of

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455 This called for repurposing and transformation of non-sanitary buildings and existing infrastructure such as schools, hotels, trade centers and city parks, for example, for the erection of temporary hospital spaces consisting of shipping containers, inflatable systems, tent structures, partition panels, etc. See Łukasik and Porębska 2022 *Int. J. Environ. Res. Public Health* 1; Capolongo *et al* 2020 *Acta Biomed* 50-51; Brambilla *et al* 2021 *Int. J. Environ. Res. Public Health* 2.

456 Sharifi and Khavarian-Garmsir 2020 *Science of the Total Environment* 6-7.

457 Temmer, Smith and Terton *Building a Climate-Resilient City: Disaster Preparedness and Management* 1.

458 Paterson *et al* 2014 *Int. J. Environ. Res. Public Health* 13106.

459 See Paterson *et al* 2014 *Int. J. Environ. Res. Public Health* 13107-13108.

460 Godschalk 2003 *Natural Hazards Review* 137.

461 Bahadur and Tanner 2014 *Environment and Urbanization* 203.

people for resilience and maintain that people are often underemphasised, and their influence in addressing climate change issues is underplayed in resilience-thinking approaches, which results in ignorance of the inherent political complexity of (disaster) risk management. This feature, therefore, supports the idea that communities, as a whole and as an imperative component of urban areas, need resilience against climate-related risks and disasters.[462] This requires such communities to adopt comprehensive approaches to preparing for, adapting to, recovering from and withstanding climate-related disasters and the devastation they may leave behind. This feature further relates to the social and political accountability of local authorities (such as city governments) in ensuring social inclusion, and promotion of community participation, social protection and basic social services based on the principles of equity, equality and fulfilment of human rights.[463]

When considering the SES approach, community structures and participation platforms that enable communities to take part in discussions and decisions affecting their resilience to disasters are vital in ensuring that the voices and needs of the communities are heard and considered. This may be done through multi-sectoral and multi-stakeholder collaboration that includes community organisations, civil society and citizen mobilisation.[464] However, it is prudent that the citizens and civil society organisations that play a key role as intermediaries between people, government and other organisations be linked with formal governance structures and networks to succeed in fostering community resilience.[465]

For communities to be considered resilient, Kais and Islam[466] argue that they need actions to "enhance personal and collective capacity (and capability) of its members and institutions to adapt to constant and gradual threats and changes, have

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462 This is also known as social resilience. See Kais and Islam *2016 Int. J. Environ. Res. Public Health* 5; Spires *et al Building Resilience in African Cities: A Think Piece* 5.

463 UN-Habitat *CityRAP Tool* 42.

464 See, for example, Twigger-Ross *et al Community Resilience to Climate Change: An Evidence Review* 3-5; Satterthwaite 2013 *Environment and Urbanization* 383.

465 Twigger-Ross *et al Community Resilience to Climate Change: An Evidence Review* 3; Spires *et al Building Resilience in African Cities: A Think Piece* 9.

466 Kais and Islam 2016 *Int. J. Environ. Res. Public Health* 9-10.

cumulative mechanisms to monitor and manage risks; are multi-scalar; can adequately manage its resources; are "relatively autonomous and self-sufficient in relation to economic decision-making" with wider and more diverse local economy and employment opportunities; have efficient economic, social and environmental capital; can identify inherent vulnerabilities; have external support actors and goods and services; have resilient built infrastructure and basic service delivery; and can effectively protect and manage their natural resources and capital.[467] These characteristics are also prevalent in many of the other features and overlap with the other spheres identified. Bahadur and Tanner caution, however, against trade-offs benefiting only the resilience of some groups or certain aspects in urban areas, without due consideration of the complexities of social systems, and thereby increasing vulnerability for other communities.[468] As vulnerable and marginalised groups are often disproportionately affected by the impacts of climate change, it is important that they not be left behind and that they be included in the community structures and civil society as envisioned here.[469] This entails to having the necessary access to meaningful participation platforms, information, and decision-making forums to voice their needs and concerns, ensuring that all segments of the community are actively involved and contribute to the community's long-term socio-economic and environmental sustainability, as well as being included in immediate action initiatives that foster the resilience of the community.[470]

Furthermore, community resilience can be improved by encouraging and fostering social inclusion and cohesion and ensuring well-planned public spaces and city policing to protect vulnerable groups. Perhaps related to access to knowledge and participation platforms below,[471] it is important that stakeholders, such as community members and representative community-based organisations (CBOs), be given adequate opportunity to participate in urban climate resilience-related

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467 Kais and Islam 2016 *Int. J. Environ. Res. Public Health* 9-10. See also Ndebele-Murisa *et al* 2020 *PloS ONE* 2.

468 Bahadur and Tanner 2014 *Environment and Urbanization* 203.

469 Schipper *et al* 2020 *Climate and Development* 1.

470 Randolph "Creating the Climate Change Resilient Community" 135; Godschalk and Rouse *Sustaining Places: Best Practices for Comprehensive Plans* 3.

471 See para 2.3.2.4 below.

discussions, decisions and policymaking, as these decisions would ultimately also affect them.[472] Additionally, such structures and platforms enable active engagement, collaboration and collective action among community members as they establish social cohesion and empowerment.[473] Moreover, they foster knowledge dissemination, raise awareness, contribute to local expertise and context, allow for inclusivity and equity through including diverse perspectives (inclusive of marginalised and vulnerable groups), encourage community ownership and buy-in into climate resilience initiatives, and assist in building adaptive capacity.[474] Such community- or civil-based approaches can result in enhanced adaptive capacity of individuals and communities to climate disasters and "building back better".[475]

2.3.2.4 Access to knowledge and public participation

This feature relates to the resilience of the community and other stakeholders within the city space, and is aimed at empowering and educating the stakeholders so that they can enhance their individual resilience to climate impacts.[476] This could include, for example, education, knowledge dissemination, and awareness campaigns and workshops to help communities better understand the effects that climate change and the resultant shocks and stresses can have on their livelihoods, well-being, and safety. This, in turn, has the potential to encourage behavioural changes at the individual and community levels. Here, it is also imperative to include marginalised and vulnerable groups such as women and children,[477] those living in informal settlements, and the urban poor, as such campaigns can lead to empowerment and improved individual and communal resilience.[478] As a result, community members

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472 Parry *Building a Climate-Resilient City: Transformational Adaptation* 4.

473 Kais and Islam 2016 *Int. J. Environ. Res. Public Health* 3-4; Randolph "Creating the Climate Change Resilient Community" 135-136.

474 Ndebele-Murisa *et al* 2020 *PloS ONE* 2-3.

475 Randolph "Creating the Climate Change Resilient Community" 137.

476 The Rockefeller Foundation and Arup *City Resilience Framework* 7; Spires *et al Building Resilience in African Cities: A Think Piece* 9.

477 Fambasayi 2021 *The International Journal of Children's Rights* 873; Fambasayi and Katsidzira 2022 *International Journal of Child, Youth and Family Studies* 55; Fambasayi 2021 *Stell LR* 398. See also Bhatia and Singh 2019 *The Journal for Decision Makers* 183; Allen, Lyons and Stephens 2019 *Energy Research & Social Science* 1-2.

478 UN-Habitat *CityRAP Tool* 15.

would be better capacitated to participate in public participation activities and voice their concerns when development or planning decisions in their areas are being made that could influence their safety, health and well-being, their livelihoods, job security, service delivery, possible displacement, environment, and their community resilience. This is often referred to in literature as participative planning and entails that all relevant stakeholders be included from the onset of the process, engage meaningfully in the exchange of ideas, and contribute to informed decision-making and collaboration.[479] Additionally, local knowledge and expertise play an important role in public participation as they help identify community vulnerabilities and context-specific resilience solutions due to the unique insights local communities can offer on their local environment, resources, needs and capacities.

Such campaigns and knowledge-building initiatives should also capacitate local stakeholders to self-regulate and capacitate themselves and help themselves better adapt to and respond to or recover from climate-related disasters and improve the resilience of their own communities as part of a bottom-up and collaborative approach. Furthermore, continuous outreach and engagement processes may arguably help citizens better prepare for and respond to the changing circumstances and variability of climate-related disasters and shocks and stresses.[480] These awareness campaigns should arguably also be used to inform communities and individuals of the urban (disaster) risks and vulnerabilities in their communities, and feasible solutions for the prevention and preparedness for such disasters.[481] Fostering such approaches to include, educate, and inform community stakeholders may arguably also lead to ownership and taking responsibility within communities, and foster transparency and accountability of decision-makers.[482]

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479 UN-Habitat *CityRAP Tool* 17; Parry *Building a Climate-Resilient City: Transformational Adaptation* 5, 7.

480 Temmer, Smith and Terton *Building a Climate-Resilient City: Disaster Preparedness and Management* 1.

481 UN-Habitat *CityRAP Tool* 15.

482 UN-Habitat *CityRAP Tool* 17; Temmer, Smith and Terton *Building a Climate-Resilient City: Disaster Preparedness and Management* 7-8.

2.3.3 Environmental sphere

2.3.3.1 Natural environment

As mentioned above,[483] the environmental sphere encapsulates both the economic and social spheres due to the interdependencies and interlinkages between the three spheres. Furthermore, it is apparent that the environment is affected by climate change in the ways mentioned above[484] and that volatile and unexpected extreme weather occurrences may cause further devastation in the declining natural resource base on which all human existence depends. The importance of the natural environment is also evident in the categorisation of environmental rights as human rights, and these rights are widely framed to include many aspects of relevance to urban climate resilience.

Urban areas are key contributors to pollution and environmental degradation, with the growth and development in city boundaries due to overconsumption of natural resources beyond their capacity to provide such resources, increased energy production, growing industry, and higher GHG emissions.[485] The natural environment is crucial for enhancing urban climate resilience and depends on ecosystem services that support adaptation, mitigate climate impacts, and promote overall well-being. The deteriorating state of the environment is cause for concern, as it means that the effectiveness of ecosystem services that can provide resilience and protection by acting as barriers and absorbers of certain effects of climate change, weather conditions, and the devastation they can cause, is diminished.[486] The decline in natural resources also exacerbates the challenges that cities face and may cause severe water and food shortages. Nature-based solutions (NBS), green infrastructure, and the protection of ecosystem services are, therefore, essential in enhancing city resilience.

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483 See para 2.2.2.2 above.
484 See para 2.1 above.
485 See Martin-Moreau and Ménascé 2018 *FACTS Report* 9.
486 Terton *Building a Climate-resilient City: Urban Ecosystems* 3.

2.3.3.1.1 Nature-based solutions

Ecosystem-based adaptation, green infrastructure,[487] ecosystem-based disaster risk reduction and water-sensitive urban design fall under the umbrella term known as NBS.[488] NBS are argued to be an integrated approach that "involves humans working with nature, as part of nature, to address societal challenges [and] benefits... human well-being and biodiversity".[489] NBS encompasses cost-effective climate mitigation and adaptation measures while also providing additional benefits to both nature and human beings and ensuring social and environmental safeguards.[490] As such, NBS contribute to the promotion of biodiversity, environmental protection, enhancement, maintenance and restoration.[491]

NBS entail using nature as a mechanism to address challenges such as climate change, food security, water resources, and disaster risk management while being considerate of the sustainable use and conservation of biodiversity.[492] Such mechanisms are becoming more prevalent in urban landscapes in the form of green infrastructure, for example, green roofs and walls, as well as urban green spaces that serve as microclimate control mechanisms to decrease urban temperatures and reduce energy consumption needed for manual cooling methods such as air conditioning, while also resulting in improved air quality.[493] Green infrastructure further entails establishing the connectivity of ecosystems through green spaces in urban areas that enhance resilience, contribute to conservation, and benefit cities through the enhancement of ecosystem services, and subsequently contribute to climate mitigation and adaptation.[494] These mechanisms, along with the use of

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487 "Green infrastructure" is defined as the interconnected natural and constructed ecological systems that are nature-based (including green spaces such as indigenous trees, wetlands, parks and green open spaces) and other landscape features at street level that form a network of infrastructure responsible for delivering services much like grey infrastructure. See Culwick *et al A Framework for a Green Infrastructure Planning Approach in the Gauteng City-region* 7; Almaaitah *et al* 2021 *Blue-Green Systems* 224.

488 Frantzeskaki and McPhearson 2021 *BioScience* 113; Kabish *et al* 2016 *Ecology and Society* 1.

489 Seddon 2022 *Science* 1; Turner *et al* 2022 *Annual Review of Environment and Resources* 124.

490 Seddon *et al* 2020 *Philisophical Transactions of the Royal Society B* 2; Seddon 2022 *Science* 1.

491 Kabish *et al* 2016 *Ecology and Society* 1.

492 Kabish *et al* 2016 *Ecology and Society* 2.

493 Kabish *et al* 2016 *Ecology and Society* 2.

494 Berte and Panagopoulos 2014 *International Journal of Urban Sustainable Development* 241.

ecosystem services, can be incorporated into urban spaces in a manner that utilises them as buffers protecting the urban area and its components from the severe effects of climate change.[495] They consequently help enhance cities' resilience to the effects of climate change. However, these measures are not receiving the necessary attention in urban policymaking and planning processes.[496]

2.3.3.1.2 Ecosystem services

This feature is centred around the environment and ecosystems within urban areas and the ecosystem services they provide.[497] As alluded to above,[498] ecosystem services have an important role to play in urban climate resilience as they deliver a range of services that are to the benefit of people and may help mitigate the effects of climate change. Ecosystem services are characterised by the Millennium Ecosystem Assessment (MEA) as provisioning, regulating, cultural, and supporting services, as depicted, with select examples of each in Figure 2-6 below.[499] Firstly, provisioning ecosystem services pertains to products derived from natural ecosystems.[500] Secondly, cultural ecosystem services refer to non-material benefits obtained from ecosystems.[501] Thirdly, regulation ecosystem services are those that regulate ecosystem processes and attempt to maintain a natural equilibrium.[502] Lastly, supporting services are necessary for the production, maintenance and support of the three foregoing services.[503]

Among these ecosystem services, there are characteristics of resilience, such as redundancy and diversity, by which more than one species or system exists that can deliver the same services, such as climate regulation or carbon sequestration, for

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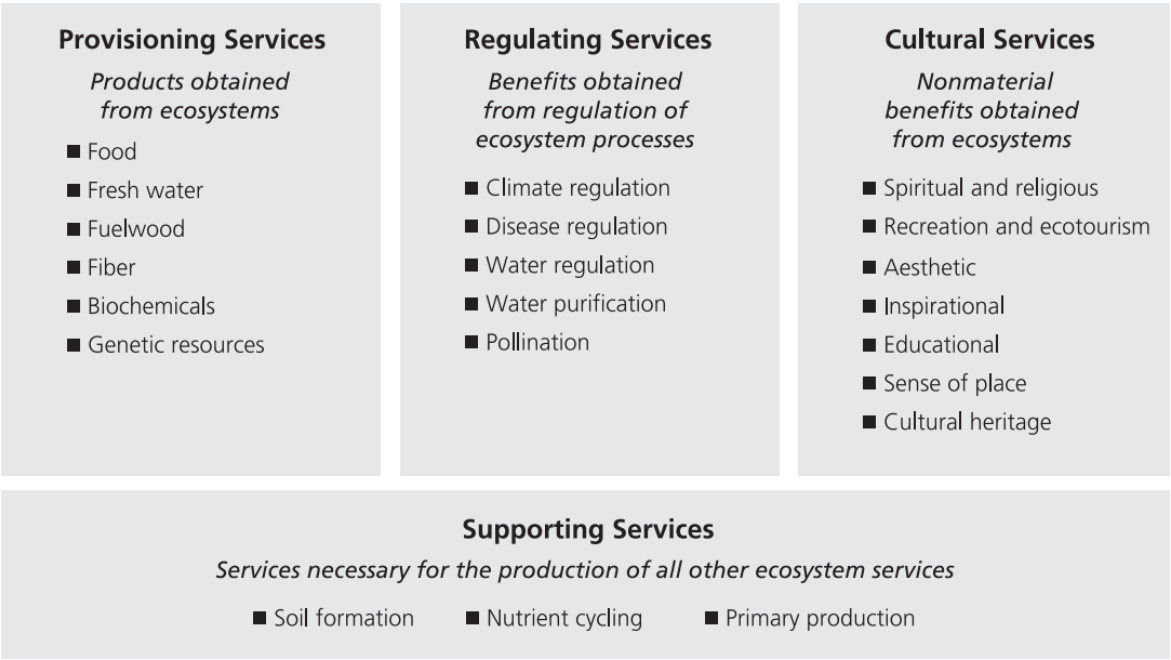
495 Wamsler *et al* 2016 *Ecology and Society* 1.
496 Parsa *et al* 2019 *Urban Ecosystems* 990.
497 The Rockefeller Foundation and Arup *City Resilience Framework* 7. See also Botes *Legal Protection of Microclimate Regulation as an Urban Ecosystem Service in South Africa* 29-37.
498 See para 2.3.3.1 above.
499 Alcamo *et al Millennium Ecosystem Assessment (MEA) – Ecosystems and Human Well-being: A Framework for Assessment* 56.
500 Alcamo *et al MEA – Ecosystems and Human Well-being: A Framework for Assessment* 56-57. See also generally Botes *Legal Protection of Microclimate Regulation as an Urban Ecosystem Service in South Africa* 29-37.
501 Alcamo *et al MEA – Ecosystems and Human Well-being: A Framework for Assessment* 57-58.
502 Alcamo *et al MEA – Ecosystems and Human Well-being: A Framework for Assessment* 58-59.
503 Alcamo *et al MEA – Ecosystems and Human Well-being: A Framework for Assessment* 59-60.

example.[504] McPhearson *et al*[505] argue that ecosystem services and resilience are interrelated concepts as "resilience can be fostered by incorporating the concept of ecosystem services in urban planning, design and management of urban social-ecological systems", and that human well-being depends on safeguarding the resilient and sustained supply of ecosystem services.

Figure 2-8: Ecosystem services examples[506]



Natural components in cities, such as urban parks, forests, wetlands, green spaces, trees, and natural permeable surfaces such as soil, serve a critical regulating purpose as they help absorb and store run-off from extensive rainfall, reduce flood risks, regulate water flow, provide shade and reduce urban heat island effects by providing microclimate regulation services, and they enhance air quality as they act as carbon sinks.[507] These ecosystem services are crucial to the mitigation and adaptation responses to climate change, and their inclusion in city planning and development is vital to enhancing urban climate resilience.[508] Ecosystem services

504 Alcamo *et al MEA – Ecosystems and Human Well-being: A Framework for Assessment* 62.
505 McPhearson *et al* 2015 *Ecosystem Services* 152.
506 Alcamo *et al MEA – Ecosystems and Human Well-being: A Framework for Assessment* 56.
507 Mngumi 2020 *Landscape and Ecological Engineering* 192.
508 Mngumi 2020 *Landscape and Ecological Engineering* 187.

also improve the livelihoods of people, the resilience of a city, and the health and well-being of a community by, *inter alia*, providing services such as nutrient cycling, filtering toxins and pollutants out of the air and water, temperature regulation, pollination and photosynthesis without which nature would cease to exist, and providing services and components that can act as barriers that decrease the effects of natural and human-made disasters.[509] If these natural systems within cities are degraded and the stresses on these ecosystems and their functions accumulate, their ability to supply ecosystem services will diminish.[510]

Other factors impacted by climate-related disasters or extreme climatic events are agriculture and food supply. Droughts and even increased rainfall could alter the viability of producing certain crops and damage crops, which influences the provisioning of food and destabilises food supply and prices.[511] This has the potential to destabilise the local economy, negatively influence the health and well-being of citizens and reduce the resilience of affected areas to these and other disasters. To address this challenge, cities need to come up with innovative ways to enhance urban climate resilience and food security in their areas, and can do so through targeted land-use zoning for food production and sales from home-grown, commercial, and community gardens and designated greenbelt zones that conserve natural spaces and agricultural farmlands.[512] Cities may also embrace novel ways of growing food, such as rooftop agriculture, hydro- and aquaponics, and vertical agriculture, to enhance food resources and availability in times of drought or heavy rainfalls and reduce the amount of resources needed to produce food.[513] Other innovative ways include, for example, municipal composting programmes where organic waste is diverted from landfills to be processed into compost for use in agriculture and green spaces in cities.[514]

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509 Wittmer *et al* 2013 *The Economics of Ecosystems and Biodiversity* 15. See also Sandifer, Sutton-Grier and Ward 2015 *Ecosystem Services* 1-15; Botes *Legal Protection of Microclimate Regulation as an Urban Ecosystem Service in South Africa* 25-30.

510 Terton *Building a Climate-Resilient City: Urban Ecosystems* 2.

511 Temmer *Building a Climate-Resilient City: Agriculture and Food Security* 2-3.

512 Temmer *Building a Climate-Resilient City: Agriculture and Food Security* 3-4.

513 Temmer *Building a Climate-Resilient City: Agriculture and Food Security* 3.

514 Temmer *Building a Climate-Resilient City: Agriculture and Food Security* 5.

Due to the effects of climate change, overconsumption and unsustainable use of resources, city water resources and infrastructure may not be able to deal with variable and unpredictable extreme weather events or disasters.[515] Furthermore, in many countries, the poor are living in informal settlements that are often situated in or close to at-risk areas and are disproportionately affected by such disasters, as elucidated above.[516]

2.3.3.2 Built environment

The built environment, as opposed to the natural environment, consists of the physical infrastructure, buildings, and urban design of a city.[517] It is intricately connected to the strategic planning and design of cities and can either enhance or diminish the resilience of a city to climate-related disasters and stressors.[518] Together with the natural environment, man-made infrastructure has the ability to improve resilience against severe stressors.[519] The built environment is a network consisting of integrated green and blue infrastructure (water and natural ecological systems) and markedly, grey infrastructure that, in a resilient city, encompasses sustainable water supply and management systems, energy-sufficient systems, sustainable ICT and transportation systems and infrastructure, and integrated waste management infrastructure to enhance its climate resilience.[520] These urban systems are susceptible to the impacts of climate change.[521] Therefore, climate considerations and innovations such as flood-resistant buildings, green roofs and buildings, sustainable drainage systems, and permeable and vegetated surfaces can be integrated into developments, planning, and design practices to minimise

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515 See para 2.3.3.1.2 above.
516 See para 2.3.2 above.
517 SACN *State of the Cities Report*.
518 Andersson *et al* 2022 *Current Opinion in Environmental Sustainability* 4.
519 The Rockefeller Foundation and Arup *City Resilience Index* 23.
520 Kapetas and Fenner 2020 *Phil. Trans. R. Soc. A* 2-3; Culwick *et al A Framework for a Green Infrastructure Planning Approach in the Gauteng City-region* 7.
521 Da Silva, Kernaghan and Luque 2012 *International Journal of Urban Sustainable Development* 128.

vulnerability and enhance adaptive capacity and resilience to withstand climate hazards such as storms, floods, and extreme temperatures that challenge cities.[522]

The development of infrastructure and services with climate resilience in mind could build longer-term resilience and stand to reduce the risk and vulnerability a city faces.[523] This feature is highly relevant to the built environment in which the built infrastructure, including green, blue and grey infrastructure in cities, also requires resilience to climate-related disasters. Such development requires innovation and the use of smart and maintained infrastructure to capacitate cities to deal with these stresses and shocks. It goes hand-in-hand with ecosystem services and NBS mentioned above[524] and further requires adequate spatial planning and land use management, policy, and design, inclusive of the protection of urban green spaces within the built environment.[525]

Keeping the above in mind, not all existing infrastructure in the built environment fosters urban climate resilience, as they have certain issues and would need improving, such as current transportation modes in cities, accessibility and safety of urban spaces and green spaces, current energy provision models, water and sanitation systems, and old heat-generating and heat-trapping infrastructure and buildings.[526] Climate resilient infrastructure would, therefore, require consideration and inclusion in planning and decision-making processes to ensure adaptive capacity to uncertain and unexpected events.[527] The features included under the ambit of this sphere, therefore, relate to good and integrated land use and spatial planning, basic service infrastructure, ICT technology and mobility systems and transport infrastructure.

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522 Kapetas and Fenner 2020 *Phil. Trans. R. Soc. A* 2.
523 Sethi *et al* 2021 *PLOS ONE* 12.
524 See para 2.3.3.1 above.
525 Venema and Temmer *Building a Climate-Resilient City: The Built Environment* 1-3.
526 Pichola, Kelkar and Bratek *Building Climate-resilient Cities: Exploring the Five Lenses of Climate Action* 7-11.
527 Temmer and Venema *Building a Climate-resilient City: Transportation Infrastructure* 2-3

2.3.3.2.1 Integrated land use planning

Land use planning involves the strategic allocation and management of land in an urban area, which may be marked for residential, commercial, industrial, recreational or other purposes.[528] Land use planning is essential in cities as it determines the layout and functionality of a city, as well as where certain infrastructure is located.[529] It further serves to optimise land use efficiency and promote sustainable urban development. Land use can impact the natural and built environment, the health and well-being of people, economic growth, and socio-economic predisposition in cities.[530] Therefore, land use planning should discern public and private interests to prevent inefficient patterns of development, unsustainable, conflicting and incompatible land uses, and evaluate the effects that the decisions on one owner's land use may have on the greater community.[531]

Effective land use planning and zoning have the potential to contribute to comprehensive hazard, exposure, risk and vulnerability identification to assist in targeted mitigation and adaptation measures for responding to climate-related stressors.[532] For this, cities might incorporate an integrative systems-based approach to land use planning in order to facilitate the integration of urban green spaces and other green infrastructure, the inclusion of ecosystem services,[533] effective disaster risk management, transit-oriented development, and factoring climate resilience into the urban design.[534] This approach may extend to the adoption of green building codes and standards,[535] zoning regulations for flood-prone and other vulnerable

528 Metternicht *Global Land Outlook Working Paper: Land Use Planning* 4-5.

529 Duranton and Puga "Urban Land Use" 468; The World Bank 2015 https://urban-regeneration.worldbank.org/node/39.

530 Van der Berg 2022 *European Journal of Risk Reduction* 6-7; OECD *The Governance of Land Use: Policy Highlights* 4.

531 OECD *The Governance of Land Use: Policy Highlights* 4-6.

532 The Rockefeller Foundation and Arup *City Resilience Index* 23.

533 Haq "Urban Green Spaces and an Integrative Approach to Sustainable Environment" 159; Ronchi, Arcidiacono and Pogliani 2020 *Sustainable Cities and Society* 2.

534 Nowak *et al* 2023 *Sustainability* 20; UNDP *Issues Brief: Urban Climate Resilience* 4-5; Da Silva, Kernaghan and Luque 2012 *International Journal of Urban Sustainable Development* 125-126.

535 Green Building Council South Africa (GBCSA) *Building the Future* 30-37. Although building codes and standards (determined by the South African Bureau of Standards (SABS) in the form of South African National Standards (SANS)) are not generally considered to fall within the ambit of land use planning and the competence of local government, building regulations form part

areas, retrofitting of existing public sector infrastructure to make it more climate resilient,[536] and improving municipal governance and system infrastructure to increase investment, funding, and budgeting opportunities for green finance and improvements for climate resilience at city- (street) level.[537]

Furthermore, integrative land use planning can accordingly enhance the adaptive capacity of cities through the above measures to decrease urban heat islands and pollution, enhance air quality, and promote the protection of biodiversity and urban ecosystems through allocating buffer zones, for example.[538] Land use planning can also be used to situate critical infrastructure in less vulnerable and hazard-prone areas to increase its climate resilience and limit disruptions caused by disasters.[539] Effective land use planning can also contribute to sustainable resource use and high levels of redundancy and mixed land use to enhance the resilience of systems and infrastructure.[540] Land use planning and more efficient urban form in urban areas, therefore, include considerations of density (high densities of people and buildings in a limited space), diversity (of uses such as mixed-use), and design (relating to

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of the matters falling within the executive and administrative mandates of local government in terms of Schedule 4B of the Constitution under which other aspects have been argued to also fall under their legislative competence such as electricity reticulation and municipal planning. It is also a matter arguably incidental to the effective administration of municipal planning, which arguably provides municipalities to legislate on building regulations – many municipalities have taken this opportunity (see, for example Lesedi Local Municipality *Building Regulations and Standards By-law* (2018); Drakenstein Local Municipality *Building Control By-law* (2020)); and developed building regulation by-laws which they indicate is supplementary to the *National Building Regulations and Standards Act* 103 of 1977 and subsequent Regulations – See GN R574 in GG 31084 of 30 May 2008 (the *National Building Regulations* (2008)).

536 Rosenzweig *et al Climate Change and Cities* xxiii; The Rockefeller Foundation and Arup *City Resilience Index* 23; Temmer and Venema *Building a Climate-resilient City: Transportation Infrastructure* 2-3; Berte and Panagopoulos 2014 *International Journal of Urban Sustainable Development* 242; Asian Development Bank *Urban Climate Change Resilience* 17, 19; McCullough *Building a Climate-resilient City: Economics and Finance* 5, 9; Terton *Building a Climate-resilient City: Urban Ecosystems* 2.

537 See Asian Development Bank *Urban Climate Change Resilience* 17, 19; McCullough *Building a Climate-resilient City: Economics and Finance* 5, 9; Terton *Building a Climate-resilient City: Urban Ecosystems* 2.

538 Van der Berg 2022 *European Journal of Risk Reduction* 7; Kithiia and Dowling 2010 *Cities* 466; Ghoneem 2016 *Procedia – Social and Behavioral Sciences* 678; Filho *et al* 2019 *Science of the Total Environment* 1176; Colding 2007 *Landscape and Urban Planning* 50.

539 See, for example, Scott and Lennon 2020 *Planning Theory & Practice* 127; Greiving *et al* 2021 *Sustainability* 3.

540 Zhang, Wang and Li 2023 *Int. J. of Environ. Res. Public Health* 2-3; Dong, Jin and Deng 2020 *Journal of Cleaner Production* 12; Salat and Bourdic "Urban Complexity, Efficiency and Resilience" 32.

the safety and accessibility of the urban space, for example) to make cities more environmentally sustainable, economically competitive, socially just, more inclusive, and potentially more climate resilient.[541] Land use planning is also intricately linked to the resilience of transport, energy and communication systems.

2.3.3.2.2 Basic service infrastructure

Within the built environment, the basic service infrastructure plays a vital role in supporting the social and economic aspects of cities by providing the necessary physical infrastructure for service delivery.[542] This infrastructure is necessary to sustain services that are fundamental to the functionality and well-being of urban populations and encompasses systems such as water supply, sanitation, energy, and transportation.[543] Grey infrastructure[544] is important in the efficient supply of these services since it includes the physical infrastructure, networks, and facilities required for their provision and delivery.[545] Even so, grey infrastructure is susceptible to rigidity and may become outdated or damaged due to changing circumstances, such as a growing population size and increased demand and pressure on such infrastructure, along with the challenges of climate-related disasters and

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541 Liang *et al* 2020 *Evaluation and Program Planning* 2; Suzuki, Cerveri and Iuchi *Transforming Cities with Transit* 35-36.

542 Baker *Climate Change, Disaster Risk, and the Urban Poor* 27-28. These types of infrastructure are also referred to as critical infrastructure or utility infrastructure.

543 Heinimann and Hatfield "Infrastructure Resilience Assessment, Management and Governance – State and Perspectives" 171.

544 Grey infrastructure (critical infrastructure or utility infrastructure) refers to human-engineered "facilities, services and installations (material fabric) required for the functioning and development of cities." Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 65. As such it includes critical elements of the built environment with socio-economic influence such as transport systems and networks, ICT systems and networks, water and sanitation systems like water- and sewerage treatment plants, energy facilities and lines for the production, transmission and distribution of power, as well as a range of "social facilities" or public institutions like schools and hospitals, that are necessary for the continued functioning of a city, society or community and to foster resilience in the face of disturbance. See also Steele, Hussey and Dovers 2017 *Urban Policy and Research* 2-3; Moteff and Parfomak *Critical Infrastructure and Key Assets* 1-4. Such infrastructure is usually composed of concrete and steel and has further been characterised as "facilities with high fixed costs, long economic lives, strong links to economic development, and a tradition of public sector involvement." Moteff and Parfomak *Critical Infrastructure and Key Assets* 3. See also Dong, Guo and Zeng 2017 *Water Research* 281.

545 Andersson *et al* 2022 *Current Opinion in Environmental Sustainability* 1.

stressors.[546] As such, literature proposes the incorporation of blue-green infrastructure[547] or using what is termed urban ecological infrastructure to decrease the strain on physical man-made infrastructure.[548]

For climate resilience, water delivery systems must be sustainable. Such a sustainable water supply is made possible by adequate urban water infrastructure and water-sensitive urban design, which includes reservoirs, distribution systems such as pipes, pumping stations and plumbing, and treatment facilities, as well as stormwater harvesting systems and alternative nodes of supply in the case of disruption of the main supply networks.[549] This is especially important during times of drought or flooding. By preserving water resources and lowering vulnerability to water scarcity, employing effective water management techniques like rainwater collection and water recycling can improve resilience.[550] Faulty, ageing, and poorly maintained infrastructure exacerbates water insecurity and threatens the economic, social and environmental spheres.[551] To counter these infrastructure deficits, innovative approaches such as intelligent water management technologies for the

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546 O'Donnell *et al* 2021 *Journal of the British Academy* 160; Chirisa *et al* 2016 *Development Southern Africa* 116; Andersson *et al* 2022 *Current Opinion in Environmental Sustainability* 1; Adey, Hackl and Martani 2022 *Proceedings of the Institution of Civil Engineers – Smart Infrastructure and Construction* 105.

547 Blue-green infrastructure is an ecosystem services-based approach relying on natural biophysical processes and functions (such as evapotranspiration, shadowing, cooling, retention, draining, storage, filtration, and biophysical uptake or absorption, amongst others) including both blue components (natural or manmade forms of water implemented in the city) and green components (such as trees, rain gardens, green roofs, bioswales, wetlands, waterways, wildlife habitats, conservation lands, open spaces like parks, etc.) due to the interconnectedness of aquatic and terrestrial ecosystems. It is often used interchangeably with "green infrastructure", which refers to nature-based systems and comprises "connected networks of multi-functional green and open spaces that provide ecosystem services" – Liao, Deng and Tan "Blue-green Infrastructure: New Frontier for Sustainable Urban Stormwater Management" 204-207. See also Ghofrani, Sposito and Faggian 2017 *International Journal of Environment and Sustainability* 16-18; Almaaitah *et al* 2021 *Blue-Green Systems* 224; Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 65-66.

548 Almaaitah *et al* 2021 *Blue-Green Systems* 224; Nguyen, Bach and Pahlow 2022 *Blue-Green System* 59.

549 Nguyen, Bach and Pahlow 2022 *Blue-Green Systems* 59; Páez-Curtidor, Keilmann-Gondhalekar and Drewes 2021 *Sustainability* 2; Liu, Shao and Wang 2021 *Water* 2; Venema and Temmer *Building a Climate-resilient City: Water Supply and Sanitation Systems* 4-5.

550 Nguyen, Bach and Pahlow 2022 *Blue-Green Systems* 59.

551 Liu, Shao and Wang 2021 *Water* 2.

"control, monitoring, regulation of the usage and quality of water resources" and maintenance of such infrastructure need to be deployed.[552]

Public health and environmental well-being, as alluded to above,[553] depend on resilient sanitation infrastructure, such as wastewater treatment facilities and sewage systems, for the safe disposal of human waste and wastewater in cities.[554] In locations that are prone to flooding or during extreme weather events, inadequate or poorly managed sanitation systems can contribute to the spread of diseases.[555] Cities, particularly in the face of climate change, can reduce the risk of waterborne diseases and safeguard the well-being of their citizens by ensuring proper sanitation infrastructure. Furthermore, sanitation infrastructure that is compromised due to weather extremes, increased pressure and demand can result in contamination of water sources, failure of existing systems, and increased risk of flooding.[556] Therefore, resilient sanitation infrastructure and maintenance of existing systems are crucial for service delivery, preventing pollution of water sources used to supply water, environmental protection, and safeguarding human health and well-being. In addition to resilient and maintained infrastructure, other mitigation measures might also contribute to the urban climate resilience of sanitation infrastructure, such as sustainable resource usage and energy-efficient processes in water treatment plants, along with behavioural changes with respect to water conservation.[557]

Climate change and urbanisation result in higher energy consumption in cities. This effectively means that conventional infrastructure designs need to be adapted to improve resilience to climate-related shocks and stresses in the form of renewable

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552 Steyn *The Realisation of the Constitutional Water Right in the South African Cities through Intelligent Water Management Technologies* 4; Rehm *et al* 2021 *Water* 4.

553 See para 2.3.2 above.

554 See Muradás *et al* "Mainstreaming Climate Adaptation in Mozambican Urban Water, Sanitation, and Drainage Sector" 2637.

555 Diedericks *Municipal Regulation of Communicable and Vector-borne Disease Control in terms of South African Law* 14-16.

556 Dong, Guo and Zeng 2017 *Water Research* 281.

557 Butler *et al* 2016 *Global Challenges* 65, 70.

energy generation and storage technologies, for example.[558] There are movements towards energy efficiency through retrofitting the existing built environment with more energy-efficient solutions and moving away from carbon-intensive energy production to more renewable and sustainable energy production.[559]

To reiterate, basic service infrastructure ideally consists of diverse, upgraded, sustainable, and maintained energy supply systems, efficient water supply systems ensuring safe, drinkable water with wide area coverage and maintenance, wastewater and sanitation systems for waste treatment and discharge, solid waste collection and treatment systems, along with stormwater management systems.[560] To realise and maintain such infrastructure will require a holistic approach considering the water-energy-food (WEF) nexus[561] and increased financial capacity, investment, governance and management.[562]

2.3.3.2.3 Information communication technology or infrastructure

ICT-enabled solutions, along with robust physical systems and infrastructure, offer valuable tools for enhancing adaptive capacity, monitoring climate-related risks, and facilitating effective response and management strategies to climate change-related challenges.[563] ICT comprises an array of digital tools, including sensors, data analytics, communication networks, and geospatial technologies that include

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558 Venema and Temmer *Building a Climate-Resilient City: Electricity and Information and Communication Technology Infrastructure* 1-7.

559 Nowak *et al* 2023 *Sustainability* 2.

560 UN-Habitat *CityRAP Tool* 39; Venema and Temmer *Building a Climate-resilient City: Water Supply and Sanitation Systems* 3.

561 The WEF-nexus is a concept conceived to study and manage global resource systems pertaining to water, energy, and food, as these systems are argued to be intricately interlinked and interdependent, this "nexus" supports the notion of systems thinking, and is a new approach, research agenda and paradigm for addressing complex resource and development challenges. This nexus "underscores the intricate links between water and other essential dimensions of human life, such as energy and food" – Viljoen 2024 *LEAD Journal* 80. See also Endo *et al* 2017 *Journal of Hydrology: Regional Studies* 20-21; Bhaduri *et al* 2015 *Water International* 723; Leck *et al* 2015 *Geography Compass* 445-447; Albrecht, Crootof and Scott 2018 *Environ. Res. Lett.* 1-5; Zhang *et al* 2018 *Journal of Cleaner Production* 626.

562 Adey, Hackl and Martani 2022 *Proceedings of the Institution of Civil Engineers – Smart Infrastructure and Construction* 107.

563 The Rockefeller Foundation and Arup *City Resilience Index* 23; Ospina and Heeks *Unveiling the Links between ICTs & Climate Change in Developing Countries: A Scoping Study* 3; Mow *et al* 2017 *Electronic Journal of Information Systems in Developing Countries* 2.

geographic information systems (GIS) and spatial data.[564] ICTs, therefore, comprise mapping, modelling or communication technologies and systems.[565] These revolutionary solutions enable the collection and exchange of data and promote informed planning and decision-making processes, as well as improved disaster risk management.[566] Data and information are critical for addressing the climate-related challenges that cities face, as adequate mitigation and adaptation responses cannot be leveraged without adequate knowledge and up-to-date data.[567] In the context of climate resilience, ICT facilitates early warning systems for impending disasters, climate data management, and public awareness and education that feed back into the economic, social and environmental spheres of the suggested model for this study.[568] Furthermore, ICT-driven data analytics and infrastructure optimisation lead to more efficient resource management, such as water conservation and energy use reduction.[569] There are also ICT systems and infrastructure that can address issues related to, or exacerbated by, climate change impacts, such as water quality monitoring, smart water infrastructure to assist cities in identifying water losses and damaged infrastructure, spectral image sensor systems, monitoring and location systems to locate critical infrastructure, amongst others.[570] They also strengthen sustainable urban development, minimise environmental impacts and ensure long-term city viability.[571]

Early warning systems that integrate weather monitoring and predictive analytics may provide timely alerts about impending climate-related hazards, such as storms,

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564 Chien, Hori and Saito 2022 *Urban Analytics and City Science* 1393; Emmanouil and Nikolaos 2015 *Recent Advances in Computer Engineering Series* 477-478; Blaschke *et al* 2011 *Remote Sensing* 1746; Curtis and Curtis "Geospatial Technologies and Emergency Management" 98.

565 Pine *Technology and Emergency Management* 243.

566 Batty *et al Visualising the City: Communicating Urban Design to Planners and Decision-Makers* 1.

567 Chien, Hori and Saito 2022 *Urban Analytics and City Science* 1400; Mow *et al* 2017 *Electronic Journal of Information Systems in Developing Countries* 2; Grasso *Early Warning Systems: State-of-Art Analysis and Future Directions* 7.

568 Mow *et al* 2017 *Electronic Journal of Information Systems in Developing Countries* 4.

569 Kirwan and Fu *Smart Cities and Artificial Intelligence: Convergent Systems for Planning, Design and Operations* 2.

570 Park, Kim and Lee 2020 *Water* 2; Curtis and Curtis "Geospatial Technologies and Emergency Management" 104-106.

571 Kirwan and Fu *Smart Cities and Artificial Intelligence: Convergent Systems for Planning, Design and Operations* 4.

floods, droughts, or heatwaves.[572] These warning systems empower local authorities and communities to take proactive response measures or alert communities to evacuate vulnerable areas.[573] ICT-enabled early warning systems also facilitate the increased capability of rapid response to climate-related disasters, resulting in reduced loss of life and less property damage, and accordingly, contribute to disaster preparedness and emergency management in cities.[574]

Climate data management pertains to the efficient gathering, storage, and analysis of climate data. Climate data enables researchers and policymakers to identify trends, assess risks and vulnerabilities, and formulate evidence-based strategies.[575] Access to reliable data is crucial for developing targeted interventions and adaptive planning.[576] In addition to climate data, digital platforms and telecommunication networks are imperative to disseminate climate-related information to the public to improve their understanding of the climate-related risks and vulnerability they face, foster their engagement in decisions and matters that affect them, foster public participation, resourcefulness and self-learning of communities in order to build social resilience, and enable them to effectively engage in disaster preparedness and emergency management.[577] ICTs can also include remote learning technologies, which can be used to foster knowledge dissemination, provide education, and provide access to information,[578] especially in cases of emergency or states of disaster, such as the Coronavirus that took the world by storm in 2020 and caused

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572 Masinde 2015 *African Journal of Science, Technology, Innovation and Development* 8; Onafeso and Samuel "The Role of ICT in the Establishment of Flood Early Warning System in Nigeria" 2; Upadhyay and Bijalwan 2015 *American Journal of Environmental Protection* 71-73; Ajwang and Nambiro 2022 *International Journal of Computing Science Research* 1051.

573 The Rockefeller Foundation and Arup *City Resilience Index* 23, 25; Mow *et al* 2017 *Electronic Journal of Information Systems in Developing Countries* 3.

574 Temmer, Smith and Terton *Building a Climate-resilient City: Disaster Preparedness and Emergency Management* 3-5; Wenzel and Zschau *Early Warning for Geological Disasters* v.

575 Chien, Hori and Saito 2022 *Urban Analytics and City Science* 1401; Emmanouil and Nikolaos 2015 *Recent Advances in Computer Engineering Series* 478.

576 Houghton 2009 *Communications & Strategies* 43; Grasso *Early Warning Systems: State-of-Art Analysis and Future Directions* 7; 10-12.

577 Temmer, Smith and Terton *Building a Climate-resilient City: Disaster Preparedness and Emergency Management* 7; Chien, Hori and Saito 2022 *Urban Analytics and City Science* 1401; Kirwan and Fu *Smart Cities and Artificial Intelligence: Convergent Systems for Planning, Design and Operations* 72, 75.

578 Pine *Technology and Emergency Management* 246; Mow *et al* 2017 *Electronic Journal of Information Systems in Developing Countries* 1-2.

worldwide lockdowns and quarantines. Adequate ICT systems, networks, and infrastructure contribute to raising awareness about the importance of climate resilience and promoting behavioural changes that support sustainable practices.

ICTs inherently also require access to a diversity of phones and internet as well as television and radio telecommunications with multiple communication channels (in different languages and using different media), diverse coverage of networks and network operations.[579] In many countries, this raises concerns about accessibility, affordability, and marginalisation of low-income earners and vulnerable or disadvantaged groups.[580] Furthermore, ICTs may also include emergency response management systems. Moreover, ICTs are considered to have a higher degree of adaptability but are vulnerable in that the components that make up this infrastructure have a relatively short lifespan, and with the rate of development of technology, some infrastructure may become outdated and redundant or require more frequent updating and maintenance.[581]

2.3.3.2.4 Resilient mobility and transport infrastructure

Resilient mobility and transport systems are a crucial component of urban climate resilience, as they address the challenges posed by climate-related disruptions to transportation networks (including roads, bridges, railways and runways).[582] However, resilient mobility systems go beyond mere transportation; they consider the broader socio-economic, environmental, and equity aspects of urban mobility and contribute to the overall sustainability, accessibility, connectivity, inclusivity, safety, and adaptability of a city.[583] Furthermore, transport systems are dependent on and affect some of the other features discussed (such as ICTs and energy

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579 UN-Habitat *City Resilience Profiling Tool* 39; Temmer, Smith and Terton *Building a Climate-resilient City: Disaster Preparedness and Emergency Management* 8.

580 Marolla *Information and Communication Technology for Sustainable Development* 15.

581 Venema and Temmer *Building a Climate-Resilient City: Electricity and Information and Communication Technology Infrastructure* 2.

582 Wang *et al* 2020 *Transportation Research Part D* 2; Gardener *et al Climate Change Effects on the Land Transport Network Volume One: Literature Review and Gap Analysis* 9; Wilbanks and Fernandez *Climate Change and Infrastructure, Urban Systems, and Vulnerabilities* 43-44.

583 Temmer and Venema *Building a Climate-Resilient City: Transportation Infrastructure* 1-9; Martello and Whittle "Climate Resilient Transportation Infrastructure in Coastal Cities" 73; Hayes *et al* 2019 *Transport Reviews* 680.

systems) for the transport of goods as "a lifeline" of a country's economic and social operation, transport navigation and communication systems, and further adequate functioning and connectivity within the urban space.[584] However, the interdependencies alluded to here can cause cascading impacts or failures in the event of synergistic disruption of two or more systems.[585]

These systems referred to involve the design, development and maintenance of climate-resilient infrastructure that has the ability to withstand extreme weather events such as floods, storms, heatwaves and other forms of disasters, and that is reliable, efficient, and sustainable.[586] Bridges, roads, and public transit systems should be constructed to be robust and adaptable, minimising the risk of damage and ensuring that transportation remains functional, even during and after climate-related disturbances.[587] Elevated roadways, effective rainwater drainage and run-off systems, flood-resistant rail systems, and climate-resilient vehicle depots are examples of infrastructure elements that can minimise disruptions, risk and vulnerability, and damage to infrastructure and property caused by climate-related hazards.[588] Furthermore, resilient mobility and transport infrastructure are also closely intertwined with land use planning and ought to prioritise flexible and adaptive urban planning.[589] Well-planned public transit provides reliable transportation alternatives during climate disruptions, reduces individual vehicle usage, and contributes to reduced traffic congestion and GHG emissions, as well as speedy restoration times, in cost-effective ways.[590] Cities with adaptable transport

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584 Wilbanks and Fernandez *Climate Change and Infrastructure, Urban Systems, and Vulnerabilities* 29; Hayes *et al* 2019 *Transport Reviews* 678; Martello and Whittle "Climate Resilient Transportation Infrastructure in Coastal Cities" 76-77.

585 See Martello and Whittle "Climate Resilient Transportation Infrastructure in Coastal Cities" 81; Wang *et al* 2020 *Transportation Research Part D* 11; Ahmed and Dey 2020 *Journal of Infrastructure Preservation and Resilience* 17.

586 Prasad *et al Climate Resilient Cities: A Primer on Reducing Vulnerabilities to Disasters* 79.

587 Hayes *et al* 2019 *Transport Reviews* 678; Ahmed and Dey 2020 *Journal of Infrastructure Preservation and Resilience* 4.

588 Vajjarapu; Verma and Gulzar 2019 *Transportation in Developing Economies* 11; Martello and Whittle "Climate Resilient Transportation Infrastructure in Coastal Cities" 83-92; Koetze and Rietveld 2012 *Transport Reviews* 270-271.

589 Vajjarapu; Verma and Gulzar 2019 *Transportation in Developing Economies* 4; Solecki *Urban Transit Systems and Conditions of Enhanced Climate Variability* 122; Martello and Whittle "Climate Resilient Transportation Infrastructure in Coastal Cities" 83.

590 Ahmed and Dey 2020 *Journal of Infrastructure Preservation and Resilience* 4-6.

networks can quickly reroute traffic or modify Schedules in response to unforeseen climate events, utilising diverse transport networks.[591] Examples of how this has been done are prevalent in the global North, and include, for example, the provision of roads, trains, speed trains, Rapid Bus Transit (RBT) systems, and other modes of public transport in cities, as well as walking, running, bicycle and scooter-friendly spaces and lanes. Furthermore, integrated approaches ensure that urban development patterns support efficient transportation networks.[592] Mixed-use zoning, transit-oriented development, and pedestrian-friendly neighbourhoods reduce the need for long-distance travel and enhance overall urban resilience. In addition, resilient mobility systems can advance energy-efficient modes of transportation, which can serve to reduce GHG emissions. Electric public transit, cycling infrastructure, and pedestrian-friendly urban designs not only enhance climate resilience but also align with broader sustainability goals.[593]

Connectivity of transportation systems is also an important part of resilient cities and can be realised through multimodal connectivity of such systems, for various options such as walking, cycling, public transit, and shared mobility.[594] This diversification further reduces dependence on a single mode of transport. Such diverse and integrated transport systems also enhance a city's ability to respond to disruptions. The integration of real-time data and smart technologies such as ICTs, discussed above,[595] also allows for efficient traffic management and rapid response during emergencies.

A resilient mobility system ensures equitable access to, and fosters inclusivity of, transportation for all members of society, including vulnerable populations.[596] Climate events often disproportionately affect marginalised and vulnerable communities, making it essential to prioritise access to transportation options that

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591 Ahmed and Dey 2020 *Journal of Infrastructure Preservation and Resilience* 2-3.
592 Hayes *et al* 2019 *Transport Reviews* 686; Al-Humaiqani and Al-Ghamdi 2022 *Sustainable Cities and Society* 9.
593 Vajjarapu; Verma and Gulzar 2019 *Transportation in Developing Economies* 2.
594 Andersson *et al* 2022 *Current Opinion in Environmental Sustainability* 5.
595 See para 2.3.3.2.3 above.
596 Al-Humaiqani and Al-Ghamdi 2022 *Sustainable Cities and Society* 10.

allow them to evacuate, access emergency services, and maintain their daily activities. Transportation solutions should be aligned with residents' needs and preferences to foster a sense of ownership and participation in building urban resilience within their urban living spaces, fostering social resilience through community participation, inclusion, and education.[597]

Resilient mobility systems should incorporate emergency preparedness and response strategies, including essential components to ensure the safety of residents, such as evacuation plans, emergency shelters, and alternative transportation options.[598] This may be achieved through leveraging innovative technologies to enhance efficiency and adaptability through ICTs, in the form of intelligent transportation systems, real-time data analytics, and smart traffic management, which can contribute to smoother traffic flow, better resource allocation, and quicker response times during climate-related disruptions.[599] Climate resilient mobility and transportation infrastructure as a proactive response is, however, expensive and requires significant investment or financial capacity, and, while having a longer lifespan than ICTs, still requires regular monitoring and maintenance.[600] In effect, this means that the resilience and climate thresholds of such infrastructure should be considered in future development and planning, keeping in mind climate change uncertainty and variability.[601]

Despite being mostly global North-oriented, approaches such as integrating climate-resilient infrastructure, multimodal connectivity, adaptive planning, equitable access, energy efficiency, and innovative technologies, cities can create transportation networks that are robust, adaptable, climate-resilient, and sustainable, even in developing or global South countries.[602] A focus on resilient

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597 See para 2.3.2 above. See also Andersson *et al* 2022 *Current Opinion in Environmental Sustainability* 7.

598 Lak, Asl and Maher 2020 *Medical Journal of the Islamic Republic of Iran* 3-4.

599 Koetze and Rietveld 2012 *Transport Reviews* 271.

600 Koetze and Rietveld 2012 *Transport Reviews* 270; Wang *et al* 2020 *Transportation Research Part D* 11.

601 Wang *et al* 2020 *Transportation Research Part D* 11; Koetze and Rietveld 2012 *Transport Reviews* 268.

602 Vajjarapu, Verma and Gulzar 2019 *Transportation in Developing Economies* 10.

mobility not only helps cities withstand climate-related challenges but also promotes efficient and equitable urban development, contributing to the overall well-being and quality of life of urban residents. Some of the enabling measures for enhancing urban climate resilience in the context of mobility and transport infrastructure and networks include retrofitting, improving and re-imagining infrastructure.

2.3.4 Governance sphere

Du Plessis and Nel argue that government, inclusive of local government, is needed to support and maintain the three abovementioned spheres (economic, social, and environmental) in Figure 2-6.[603] However, the government (as executing public authority) is responsible not only for sustained economic growth and development, service delivery and environmental protection, but also has a range of administrative, executive and legislative functions.[604] Local governments in cities, thus, have three mandates through which they should perform their functions and powers, namely governing, governance, and compliance.[605] The governing mandates of government (and in this study, local governments specifically) include regulating the constituents within their jurisdiction, and doing so through legislative and other measures. There is an extensive range of instruments available to local governments for performing their governing mandates, such as command-and-control instruments (i.e., the drafting, adoption, and enforcement of by-laws and law enforcement), fiscal instruments (incentives and disincentives like fines), agreement-based instruments, and rights- and civil-based instruments.[606]

Governance notably refers to the self-governance and administration of city governments and includes legally prescribed instruments to be used for operational planning, implementation, and performance management systems, and should be done against the backdrop of "good governance".[607] Good governance generally involves good decision-making practices and implementation, and focuses on the

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603 Du Plessis and Nel "An Introduction" 1-13.
604 Article 2.3, 2.4 and 2.5 of the *White Paper on Local Government* (1998).
605 Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-13 - 3-60.
606 Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-33.
607 Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-23.

way in which governments manage public affairs and resources. It usually consists of five key elements, namely transparency, accountability, responsibility, participation, and responsiveness to the needs of communities.[608] There are three assessment instruments for measuring (good) governance in the public sector context, with select indicators that can be used as benchmarks. The World Bank Group established the Worldwide Governance Indicators (WGI), which focuses on the government selection, monitoring, and replacement process; its capacity to formulate and implement sound policies; and the community opinion of the state and law.[609] The indicators include voice and accountability, political stability, effectiveness of government, regulatory quality, rule of law, and control of corruption.[610] The World Bank Group also provides a tool for Country Policy and Institutional Assessment (CPIA) that consists of four groups, namely, economic management, structural policies, policies for social inclusion and equity, and public sector management and institutions.[611] Finally, the Ibrahim Index of African Governance (IIAG) has a broader scope than the WGI and focuses solely on African countries, with 95 indicators, and it is consequently the most comprehensive tool for measuring governance in African countries.[612] The IIAG aims to provide a framework for citizens, governments, institutions, and the private sector to evaluate public services and policy outcomes, and serves as both a performance assessment tool for governments and a decision-making guide for civil servants.[613] The IIAG speaks not only to the features examined under the auspices of the governance sphere but also measures governance aspects of the other spheres depicted in Figure 2-6. From these instruments, the most important aspects are those pertaining to safety and the rule of law (including consideration of the efficacy of law and policy and corruption control), participation and realisation of human rights

608 Feris 2010 *PELJ* 75; Zuber, Blickenstorfer and Groth "Governance, Transparency, and the Rule of Law" 369-370.

609 Zuber, Blickenstorfer and Groth "Governance, Transparency, and the Rule of Law" 372.

610 Zuber, Blickenstorfer and Groth "Governance, Transparency, and the Rule of Law" 372; Güney 2017 *The Journal of International Trade & Economic Development* 318.

611 Zuber, Blickenstorfer and Groth "Governance, Transparency, and the Rule of Law" 373.

612 Zuber, Blickenstorfer and Groth "Governance, Transparency, and the Rule of Law" 374; Mo Ibrahim Foundation 2023 https://mo.ibrahim.foundation/iiag.

613 Zuber, Blickenstorfer and Groth "Governance, Transparency, and the Rule of Law" 374.

(i.e., also the effectiveness of government in ensuring that the needs of the community are met),[614] human development (in aspects of health, education and general welfare),[615] and sustainable economic opportunity (that includes public management, infrastructure, etc.).[616] These benchmarks, although relating to other spheres, are used to assess *how* government is meeting its obligations in relation to the realisation of the features in other spheres, and also bring the discussion back full circle as "governance" (as used in the adapted model in Figure 2-6) forms the basis on which the other spheres depend.[617] For governance of complex socio-ecological systems, such as cities, Ebbesson[618] suggests four factors to be considered for resilience. These factors include "flexibility in social systems and institutions to deal with changes"; openness of institutions (i.e., to broad participation in local decision-making and administration); the "effectiveness of multilevel governance"; and institutions fostering "learning and adaptability without limiting the options for future development".[619]

Governance instruments typically include municipal integrated development planning (IDP), spatial development frameworks (SDFs), service delivery and budget implementation plans (SDBIPs), budgets, performance management systems and reporting, financial management, supply chain management, and risk management, among others.[620] It is argued that because the other spheres are interdependent and supported by governance, the "systems" responsible for government ought to be resilient.[621] The governance part of these systems is also where green finance and budgeting, as well as allocation of funds for green/blue

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614 This aspect relates back to the social and environmental spheres in Figure 2-6. See paras 2.3.2 and 2.3.3 above. See also Gavriluţă and Lotos 2018 *Journal of Public Administration, Finance and Law* 124.

615 This aspect is far-reaching as it overlaps with all of the abovementioned spheres. See paras 2.3.1-2.3.3 above.

616 This aspect touches on the economic-sphere features discussed under para 2.3.1 above. See also Ali 2015 *The Dialogue* 65.

617 Gavriluţă and Lotos 2018 *Journal of Public Administration, Finance and Law* 124.

618 Ebbesson 2010 *Global Environmental Change* 414.

619 Ebbesson 2010 *Global Environmental Change* 414. While some of these factors have been touched on in this chapter, it is elaborated on in the discussion to follow in Chapter three. See para 3.2 below.

620 Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-32 – 3-58.

621 See Tyler and Moench 2012 *Climate and Development* 312-313.

infrastructure and sustainable service delivery, policies and mechanisms to enforce the law, etc., is situated.[622] Furthermore, this sphere, as illustrated in Figure 2-7, also denotes the "agents" and "institutions" components, as distinguished by Tyler and Moench, Desouza and Flanery, and Godschalk above.[623] Lastly, the compliance mandates of local government refer to any legislative requirements and regulations with which municipalities must comply.[624] This further goes to show that institutions and agents are just as important for urban climate resilience as systems.[625]

2.3.4.1 Sufficient law enforcement, crime prevention and rule of law

An often overlooked yet critical aspect of achieving urban climate resilience is the presence of sufficient law enforcement, effective crime prevention measures, and a strong adherence to or respect for the rule of law.[626] The rule of law provides a foundation for transparent and accountable governance, and it cannot be separated from the idea of good governance, with the two arguably being interdependent.[627] The rule of law and expectation of accountability and transparency that go hand-in-hand with (good) governance also determine the extent to which citizens respect, have confidence in, and abide by the rules and laws of a country, as well as how effective law enforcement and implementation will be.[628] This further indicates a distinct relationship between good governance, the rule of law, and public interest.[629] In addition, it presupposes the supremacy and legitimacy of the law, legal certainty, and with it, the protection of fundamental rights and freedoms as well as societal values that can foster social cohesion and community resilience. This is achieved by including public participation that will likely amount in more adaptive

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622 See McCullough *Building a Climate-resilient City: Economics and Finance* 4-5.
623 See para 2.2.4.2 above.
624 Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-20.
625 See also Hossain and Huq "Institutions Matter for Urban Resilience: The Institutional Challenges in Mainstreaming Climate Smart Disaster Risk Management in Bangladesh" 170-171.
626 Ebbesson and Hey 2013 *Ecology and Society* 1.
627 Karpen 2009 *European Journal of Law Reform* 214-215; Berendieieva *et al* 2022 *Informatol* 148.
628 Zuber, Blickenstorfer and Groth "Governance, Transparency, and the Rule of Law" 372.
629 See Berendieieva *et al* 2022 *Informatol* 147.

approaches and strengthening public acceptance of the law and governance decisions, especially during disasters.[630]

Effective implementation requires a strong legal framework, adherence to established rules and regulations (institutions), as well as stakeholder collaboration and a blend of both top-down and bottom-up approaches (also described as a centrist approach).[631] Law enforcement is crucial for the realisation of climate adaptation and resilience policies and strategies.[632] Hence, one of the subsets to this feature is an enabling regulatory environment and framework that affords the local and sub-national spheres of government some autonomy to engage with other stakeholders, leverage investment opportunities, assist in ensuring adequate law enforcement and implementation, and legislate on issues falling within their mandate, including on matters related to climate change.[633] This also means that enforcement may be done against municipal officials if they transgress environmental law, and they may be subjected to court proceedings and be fined.[634]

This feature also comprises policies and plans geared towards urban climate resilience and includes measures to improve infrastructure, as well as the functionality and ability of cities to advocate the use of new technologies to enable urban climate resilience.[635] This should then also be followed by mainstreaming urban climate resilience into existing city-level legislation, plans, policies, and governance.[636]

This feature of governance plays a significant, yet sometimes underrated role in enhancing urban climate resilience because, firstly, it promotes public safety and

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630 Feris 2010 *PELJ* 75; Ebbesson and Hey 2013 *Ecology and Society* 2-3; Van der Berg and Verschuuren *Urban Climate Resilience: The Role of the Law* 17; Ebbesson 2010 *Global Environmental Change* 416.

631 Mthtethwa 2012 *African Journal of Public Affairs* 39.

632 Wijaya 2023 *Deviance Jurnal Kriminologi* 18.

633 Van der Berg and Verschuuren *Urban Climate Resilience: The Role of Law* 7; ICLEI *Call for Inputs by the Standing Committee on Finance in the Organisation of its Next Forum* 3; Hudson, Hunter and Peckham 2019 *Policy Design and Practice* 3-6.

634 See for example *Trustees for the time being of Groundwork Trust v Minister of Environmental Affairs* 39724/2019 2022 ZAGPPHC 208 (the Deadly-air case) of 2022.

635 Sethi *et al* 2021 *PLoS ONE* 6; Kapucu 2012 *Cities* S42.

636 Sethi *et al* 2021 *PLoS ONE* 15.

emergency response as part of disaster risk reduction and response.[637] Public safety and emergency response depend on effective crime prevention measures and well-trained and knowledgeable law enforcement personnel who are able to effectively manage evacuation procedures, maintain order, and respond promptly in the event of climate-related and other disasters.[638] Secondly, law enforcement can also aid in the protection against and deterrence of opportunistic crimes such as looting, vandalism, and property and infrastructure damage, especially critical infrastructure, during and after disasters.[639] In line with this, adequate law enforcement can also enable the equitable distribution of resources in the event of resource supply shortages due to disasters. This, along with local community engagement and education and awareness-building campaigns, helps maintain social cohesion, improves disaster preparedness, encourages proactive measures for individual and collective resilience, and reduces the potential for unrest.[640] Moreover, law enforcement and emergency response agencies are crucial role players in climate-related disasters as they can facilitate the recovery and rehabilitation processes in affected areas.[641]

In addition, climate resilience is closely linked to environmental protection, as discussed above.[642] Law enforcement agencies can enforce regulations that safeguard natural resources, prevent illegal activities that contribute to environmental degradation, and ensure compliance with environmental laws that enhance the city's resilience to climate change. By upholding the rule of law and enforcing regulations that promote environmental protection and disaster preparedness, cities can better withstand climate-related challenges, safeguard

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637 Ahrens and Rudolph 2006 *Journal of Contingencies and Crisis Management* 207-208; Bonkiewicz and Ruback 2012 *Policy Quarterly* 142.

638 Bonkiewicz and Ruback 2012 *Policy Quarterly* 143; Modise 2022 *International Journal of Innovative Science and Research Technology* 1268.

639 Modise 2022 *International Journal of Innovative Science and Research Technology* 1268- 1269; Bonkiewicz and Ruback 2012 *Policy Quarterly* 142.

640 See, for example, Gavriluţă and Lotos 2018 *Journal of Public Administration, Finance and Law* 124-125; Kapucu 2012 *Cities* S42.

641 Bonkiewicz and Ruback 2012 *Policy Quarterly* 149.

642 See para 2.3.3.1 above.

their residents, and create a foundation for sustainable and resilient urban development.

2.3.4.2 Effective leadership and management

Effective leadership and management play a pivotal role in ensuring that climate resilience is prioritised, resources are allocated efficiently, and strategies are implemented cohesively. This feature is, therefore, interlinked with the idea of "good governance".[643] Effective leadership and management are dependent on a clear strategic vision for climate resilience in cities' planning instruments and development plans and frameworks that articulate their developmental goals and objectives, as this guides the development of policies, programs, and initiatives.[644] Unfortunately, climate resilience is a long-term endeavour that requires not only abundant resources, but also sustained and driven commitment to enhancing and mainstreaming urban climate resilience and prioritisation of related issues. This goes beyond the general political and administrative cycles, priorities, and short office terms.[645] Kapucu[646] ascribes the inherent difficulties in dealing with disaster risk management to ineffective leadership models and management processes and cites the inadequacies of traditional governance tools, hierarchical structures, and organisational boundaries prevalent in governments as well as "red tape" barriers, as reasons for these difficulties.

This feature additionally entails adequate knowledge and capacity to effectively manage funds allocated to urban climate resilience.[647] It also involves a sound and legitimate data- and evidence-base to support their adaptation and mitigation climate action projects.[648] Moreover, effective leadership and management in local

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643 See para 2.3.4 above.

644 Kusumasari, Alam and Siddiqui 2010 *Disaster Prevention and Management* 442.

645 Kapucu 2012 *Cities* S43. See also Gillard *et al* 2016 *WIRES Clim Change* 254, in which the authors discuss the intricacies of institutionalised political processes and agendas that are prevalent in, and often not accounted for, in socio-ecological systems and resilience research and how they circumvent climate action at an "agents" governance level.

646 Kapucu 2012 *Cities* S43.

647 ICLEI *Call for Inputs by the Standing Committee on Finance in the Organisation of its Next Forum* 3.

648 See also ICLEI *Call for Inputs by the Standing Committee on Finance in the Organisation of its Next Forum* 3.

government are critical in driving the formulation and implementation of policies that enhance climate resilience as they engage experts, stakeholders, and community members to develop comprehensive strategies that consider the city's unique vulnerabilities, strengths, and resources.[649] This is dependent on collaboration across multiple government agencies and departments, interagency coordination, breaking down silos (i.e., addressing horizontal and vertical fragmentation), and ensuring that efforts are aligned and complementary.[650] Here, the principle of cooperative governance is particularly important in ensuring the involvement of different spheres of government and line departments, depending on the structure of the particular government.[651]

Resource allocation and mobilisation come into play in the realisation of the above goals, as they are linked indirectly to issues of capacity and financial resources in cities.[652] In other words, this feature also includes institutional capacity, without which governments cannot hope to attain adequate service delivery or the implementation of action geared towards achieving any of the features mentioned in this section.[653] The capacity of local governments can be harnessed through measures such as securing funding and resources necessary for implementing climate resilience strategies. Examples of the links to urban climate resilience include advocating for investments in infrastructure upgrades, community engagement projects, research initiatives and projects, and capacity-building and skill-building programs, which can systematically lead to the building of technical capacities and knowledge to adequately assess climate vulnerability and risk in urban areas to improve mitigation and adaptation strategies.[654] Such capacity and skill-building initiatives may also result in leadership and administration in cities constantly learning and evolving to identify shortfalls and inadequate provisions in policies and

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649 Ahrens and Robertson 2006 *Journal of Contingencies and Crisis Management* 214; Kapucu 2012 *Cities* S41-S43; Fisher and Dodman 2019 *Environmental Policy and Governance* 236.

650 Kapucu 2012 *Cities* S41.

651 De Lourdes Melo Zurita *et al* 2018 *Disasters* 572-573.

652 Kusumasari, Alam and Siddiqui 2010 *Disaster Prevention and Management* 441; Kihato *From Ideas to Action: Resource Mobilisation in Cities in Developing Contexts* 7-9.

653 Sethi *et al* 2021 *PLoS ONE* 8.

654 Sethi *et al* 2021 *PLoS ONE* 6; Fisher and Dodman 2019 *Environmental Policy and Governance* 236, 245; Boyd and Juhola 2015 *Urban Studies* 1242.

legislation and assist in fostering a holistic approach using all the information and data (obtained from hazard monitoring, disaster management initiatives, weather predictions, scientific projections based on sound academic research, environmental and climate change reports, etc.) to update their policies and legislation as necessary.[655] It also means encouraging innovation, embracing new technologies, and supporting research to find novel solutions to climate-related issues in local contexts.[656]

Effective leadership and management, as well as the notion of good governance, are also dependent on community engagement and public participation platforms to ensure that communities and vulnerable groups are heard and to ensure consideration of local needs and priorities.[657] This requires city leaders and administrators to create platforms for open dialogue, ensuring that diverse perspectives are considered and fostering support for resilience-building measures at a community level.[658]

Furthermore, effective leadership, management and governance during emergency or disaster response requires the establishment of early warning systems, disaster preparedness plans, and contingency measures to minimise the impacts of climate-related disasters.[659] In effect, this also means monitoring and evaluating the effectiveness of climate resilience initiatives through tracking progress, assessing outcomes, adjusting strategies based on lessons learned, and finally, ensuring that the city is growing more climate resilient or "building back better".[660]

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655 Fisher and Dodman 2019 *Environmental Policy and Governance* 245-246.

656 See Ahrens and Robertson 2006 *Journal of Contingencies and Crisis Management* 213.

657 Kardos 2012 *Procedia - Social and Behavioral Sciences* 1167; Fung 2015 *Public Administration Review* 514; Hügel and Davies 2020 *WIRES Climate Change* 9-10.

658 This particular part of the feature ties back in with the social and economic spheres of the model depicted in Figure 2-6 and paras 2.3.1 and 2.3.2 above.

659 Ahmed *et al* "Impact of Good Governance on Disaster Risk Management" 399-400; Pal and Shaw "Disaster Governance and Its Relevance" 4-5.

660 See Bulkeley and Broto 2012 *Transactions of the Institute of British Geographers* 361-362.

2.3.4.3 Integrated urban governance and developmental planning

Integrated urban governance and developmental planning consist of both municipal spatial and strategic planning elements. It is arguably a holistic approach to urban governance that seeks to coordinate and align various sectors, stakeholders, and initiatives within a city.[661] It encompasses the systematic integration of social, economic, environmental, and spatial considerations into a comprehensive and coordinated development strategy.[662] This idea of integration is also referred to as "policy integration",[663] "boundary-spanning policy regimes", and "comprehensive planning", among others.[664] Integrated urban governance and developmental planning can also be described as a managerial strategy that addresses interdisciplinary concerns in the development of cross-cutting policies, and involves horizontal integration and vertical intergovernmental integration, as well as integration between administration and civil society.[665]

Integrated developmental planning, at the spatial planning level thereof, pertains to the urban spatial form, including the built environment, urban ecosystems, and grey, blue, and green infrastructure in the city space.[666] Integrated urban governance and developmental planning are important for cities seeking climate resilience, as they inherently also pertain to considerations of climate risk and vulnerability challenges that cities might face. For a city to attain urban climate resilience, it requires a systematic approach to planning and implementation to understand the consequences of planned and unplanned changes across the city.[667] Planning processes should be proactive and also be cognisant of local circumstances and challenges, and any possible future changes, to avoid unsustainable

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661 Harrison 2001 *TWPR* 181; Ioan-Franc, Ristea and Popescu 2015 *Procedia Economics and Finance* 702.

662 Subban and Theron 2011 *Administratio Publica* 98; Rauken, Mydske and Winsvold 2015 *Local Government* 408.

663 Trein and colleagues argue that policy integration "is considered essential to involve all actors in an integrated approach to develop and implement appropriate policy solutions." See Trein, Meyer and Maggetti 2019 *Journal of Comparative Policy Analysis* 334.

664 See Ioan-Franc, Ristea and Popescu 2015 *Procedia Economics and Finance* 702; Trein, Meyer and Maggetti 2019 *Journal of Comparative Policy Analysis* 335.

665 Ioan-Franc, Ristea and Popescu 2015 *Procedia Economics and Finance* 703.

666 Parry *Building a Climate-Resilient City: Transformational Adaptation* 4.

667 See Sowman and Brown 2006 *Journal of Environmental Planning and Management* 696.

development in the city.[668] Integrated developmental planning, therefore, plays a pivotal role in achieving a city's ability to adapt to and mitigate the impacts of climate change.

At a strategic level, integrated development planning also enables cities to comprehensively assess and incorporate their vulnerabilities and risks when faced with climate change impacts and disasters. To adequately measure the risks and vulnerabilities a city is experiencing, it is pertinent that governing bodies consider and incorporate information and data from various sectors such as infrastructure, health, environment, and social welfare.[669] Such data can be gathered through ICTs, as discussed above,[670] but particularly through geospatial and early-warning systems. Through the utilisation of these technologies, cities can identify areas that are most susceptible to climate impacts and prioritise interventions accordingly. Monitoring and evaluation mechanisms can also be used to track the progress of climate resilience initiatives and contribute to the accountability of governments. Furthermore, these mechanisms can assist governments to measure the effectiveness of strategies and development plans, allow them to make necessary adjustments, and enable continuous learning from new data as well as their own successes and failures.[671]

This feature illustrates the need for climate adaptation and mitigation measures to be integrated into sustainable urban planning processes, to link climate and non-climate policies and changes.[672] Whilst government should consider information and data from other sectors, climate resilience also requires cross-sectoral collaboration, meaning they are required to facilitate the coordination of efforts across different government departments and agencies, as well as the public and private sectors.[673] Cross-sectoral collaboration and cooperative governance help to ensure that urban

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668 Coaffee *et al* 2018 *Journal of Contingencies and Crisis Management* 404.

669 England *et al* 2018 *Regional Environmental Change* 2060-2061.

670 See para 2.3.3.3 above.

671 This also qualifies as what Bellinson and Chu term "innovations in governance", which involves "the development of new ideas, innovative interventions, and novel decision-making arrangements". See Bellinson and Chu 2019 *Journal of Environmental Policy and Planning* 76.

672 Parry *Building a Climate-Resilient City: Transformational Adaptation* 4.

673 England *et al* 2018 *Regional Environmental Change* 2060.

climate resilience is mainstreamed into various aspects of urban development, from transportation and housing to water management and disaster preparedness.[674] It is also a feedback loop that illustrates just how interdependent these sectors and features are. Cities can use these synergies between the different features to avoid the duplication of efforts and silo-functioning, in order to make the most efficient use of available financial capacity, human resources, and time.[675] Furthermore, the mainstreaming of urban climate resilience into planning and development processes ensures that climate considerations are not treated as standalone aspects affecting the city, but that they are woven into the fabric of urban planning, policymaking, and infrastructure development.[676]

A challenging aspect of climate governance is that climate change is an enduring challenge that requires long-term planning. The long-term planning required is often not compatible with local government dispensations in lieu of the political terms of elected representatives, skill and human capacity factors within local governments, and the understanding of the complexities of urban spaces as complex socio-ecological systems.[677] Ideally, integrated developmental planning would operate on multi-year timeframes that enable planning, implementation, and monitoring phases in climate resilience strategies over the necessary time span to realise such resilience outcomes.[678] This would prevent *ad hoc*, short-term solutions that may not effectively address climate impacts in the long run.[679] An integrated approach to developmental planning can also ensure that climate resilience strategies not only address immediate climate risks but also contribute to long-term community well-being.[680] Projects that enhance water management, green spaces, and energy efficiency, for example, can result in unintended benefits such as improved quality

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674 Coaffee *et al* 2018 *Journal of Contingencies and Crisis Management* 404.

675 Ioan-Franc, Ristea and Popescu 2015 *Procedia Economics and Finance* 702-703; England *et al* 2018 *Regional Environmental Change* 2060.

676 Coaffee *et al* 2018 *Journal of Contingencies and Crisis Management* 404.

677 See Coaffee *et al* 2018 *Journal of Contingencies and Crisis Management* 404; Bellinson and Chu 2019 *Journal of Environmental Policy and Planning* 85.

678 See, for example, Harrison "Integrated Development Plans and Third Way Politics" 186-187.

679 Newell, Dale and Roseland 2018 *The International Journal of Climate Change: Impacts and Responses* 2.

680 Schipper and Pelling 2006 *Disasters* 19-20.

of life for residents beyond their climate resilience needs. Nevertheless, the shorter-term integrated developmental planning in cities results in flexibility and adaptability that allows cities to adjust their climate resilience strategies based on new information and data, changing conditions, and emerging technologies, to ensure that their resilience efforts remain relevant and effective to address the challenges even in a constantly changing climate.[681] As elaborated on above, the adaptability mentioned here can also be extended to multi-dimensional, -modal, and -use solutions that consider the interplay between various aspects such as land use, transportation, social equity, and infrastructure.[682]

Collaboration with stakeholders and local partnerships is an important aspect of urban planning and development, and integrated developmental planning is reliant on meaningful engagement with a wide range of stakeholders, including local communities, businesses, civil society organisations, and academia.[683] Adequate stakeholder engagement fosters inclusivity, local and community buy-in, and effectiveness of climate resilience measures and strategies, as the developmental planning decisions taken in the interests of building urban climate resilience affect such stakeholders at the local level.[684]

In the discussion of the features above, there is arguably a deficit, namely the consideration of financial capacity. As much as some of the abovementioned features touch on investments and building resilience through proactive measures, there appears to be limited consideration of funding and financial capacity, without which many of these features would be unattainable. The availability and accessibility of financial resources for climate change action and, ultimately, the achievement of urban climate resilience are particularly problematic in countries with struggling economies. This is especially true in developing countries that are often considered to bear the brunt of climate change impacts and that do not have resilient systems, agents or institutions in place to help them adapt to, "build back

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681 Hallegatte 2009 *Global Environmental Change* 242; Quay 2010 *Journal of the American Planning Association* 498-499.

682 See paras 2.3.3.2.3 and 2.3.3.2.4 above.

683 See para 2.3.2.4 above.

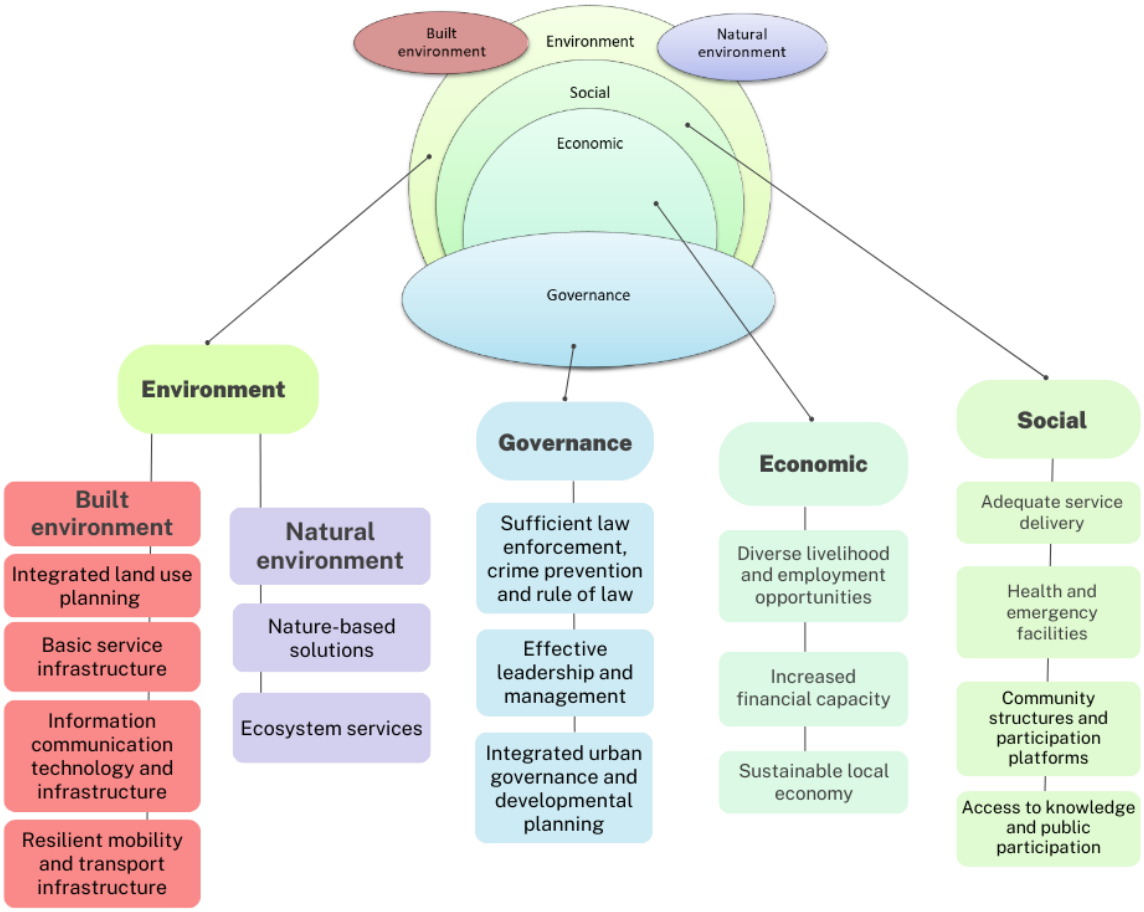
684 See para 2.3.2.4 above.

better" after, manage, recover, and adequately respond to disasters.[685] It is further likely that no one source of funding would be sufficient to address the likely costs of building resilience in a short allocated period, and long-term investment, which means funding opportunities should be obtained from different stakeholders and resources.[686] The issue of funding for environmental protection and climate mitigation, and adaptation is also a contentious subject in countries faced with other serious socio-economic issues, such as poverty, famine, unemployment, civil unrest and homelessness, that increase the risk exposure and vulnerabilities of communities. Figure 2-9 below encapsulates a holistic overview of the general features of urban climate resilience as relevant to each sphere of the adapted model as used in the context of this study. It depicts the 16 features identified and discussed in the preceding paragraphs.

685 ICLEI *Call for Inputs by the Standing Committee on Finance in the Organisation of its Next Forum* 3-4.

686 ICLEI *Call for Inputs by the Standing Committee on Finance in the Organisation of its Next Forum* 4.

Figure 2-9: Adapted spheres model with general features of urban climate resilience



Based on the extensive discussion in this chapter, it is evident that there are, arguably, unimaginable numbers of typologies that can find application in the abovementioned contexts. From the above, it is also postulated that resilience is not a "one-size-fits-all" and "catch-all" notion, meaning it will vary in different contexts, especially the local contexts of cities. The extent to which certain typologies will be applicable is also influenced by aspects such as whether a city is situated in the global North or South, whether it is a metropolitan or local municipality, and depends on the capacity and resources available to a city. Hence, to enhance resilience in specific urban areas, one would have to consider and tailor the notion of resilience to suit the needs of the specific context to which it is applied.[687] For the

[687] Spires *et al Building Resilience in African Cities: A Think Piece* 3.

purposes of this study, the notion of resilience is applied in the climate and urban contexts of South Africa.

2.4 The categorical description of urban climate resilience suitable for South Africa

2.4.1 Contextual background

The South African context is arguably different from the countries generally informing the typologies above. Much of the interpretations so far hail from areas such as North America, Europe and other developed countries, mostly in the global North. However, as alluded to above, developing regions may have vastly different contexts and face different challenges from these global North contexts. South African cities are extensively urbanised and are inadvertently growing and sprawling even further into the hinterlands. While the metropolitan city municipalities house most of the population, intermediate cities are not exempt from the challenges facing bigger urban agglomerations, as they are home to approximately a quarter of the country's population and act as linkages to rural areas.[688] Intermediate cities also face additional and unique challenges and opportunities as they include an array of larger, economically diverse cities, mining and industry hubs, poor and densely populated areas, and in many instances, jurisdictions falling under traditional authorities.[689] Metropolitan and larger cities have more economic opportunities than rural areas, more high-skill job opportunities, and higher earning capabilities for skilled workers.[690] Regardless, unemployment is rife in South Africa, with youth employment being especially problematic.[691] Moreover, the country is

688 Coalition for Urban Transitions *Seizing South Africa's Urban Opportunity* 9.

689 Marais *et al* "Secondary Cities and Spatial Transformation in South Africa" 3.

690 Coalition for Urban Transitions *Seizing South Africa's Urban Opportunity* 9; IUDF 18-19.

691 Stats SA 2023 https://www.statssa.gov.za/?p=15407; Stats SA 2024 https://www.statssa.gov.za/?p=17266; Dhliwayo 2023 https://www.undp.org/south-africa/blog/harnessing-employability-south-africas-youth; Cowling 2024 https://www.statista.com/statistics/1129482/unemployment-rate-by-age-group-in-south-africa/; De Lannoy *et al* 2020 *Journal of Applied Youth Studies* 116.

regarded as one of the most unequal countries in the world and patterns of urban development still reflect some of the spatial divisions created by apartheid.[692]

South Africa has a historically and contemporarily complex urban system that is made up of significantly diverse human activities, sensitive cultural heritage and historically relevant sites, settlement types, institutions, governance capacity, natural resources, and political boundaries.[693] In addition to the high levels of socio-economic inequality, South Africa experiences widespread, severe, structural, and persistent poverty.[694] This goes hand-in-hand with expanding informal settlements on city peripheries that are unplanned, unauthorised, and often unsafe, as they are exposed to a variety of threats and hazards, including flooding, landslides, an unhealthy and unsafe environment, and a lack of adequate basic services.[695] This, in turn, also places an additional burden on municipalities that are expected to fulfil service delivery duties in these informal and unregulated spaces in line with their legislative mandates.[696] The spatial division of South Africa's cities into functional jurisdictional areas under specific municipal authority gives way to unique, area-specific, and localised challenges that require context-specific solutions.[697]

Following on the understanding of urban climate resilience provided above,[698] this section of the chapter zooms in on a categorical description suitable for the South African context, for purposes of which a deeper understanding of the *status quo* is required. As such, this section comprises the *status quo* based on the challenges and realities in South African cities. National urban policies and relevant supporting literature pertaining to urban development, needs, and challenges will, therefore,

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692 NDP 24; Coalition for Urban Transitions *Seizing South Africa's Urban Opportunity* 10; NCCAS; Gunter and Massey "South Africa's Urban Future: Challenges and Opportunities" 283.

693 Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 93.

694 Knox-Mosdell *A Constitutional Law Perspective on Structural Poverty in South Africa* 9-10, 25; Bundy 2020 *Oxford Research Encyclopedia of African History* 1.

695 This is also known as the "urbanisation of poverty", which is a phenomenon describing the rapid urban growth of low-income households, specifically as can be observed at the peripheries of and in many South African urban areas – IUDF 18. See also Coalition for Urban Transitions *Seizing South Africa's Urban Opportunity* 10.

696 Massey and Gunter "Urban Geography in South Africa: An Introduction" 4.

697 See South African Government 2022 https://www.gov.za/about-government/government-system/local-government.

698 See para 2.3 above.

be analysed.[699] After elucidating the *status quo*, the aim is to formulate and identify actionable features for urban climate resilience in South Africa based on the categorical understanding of urban climate resilience as described above.[700] Accordingly, the *status quo* of South African cities, as specifically significant in the pursuit of enhanced urban climate resilience, can be surmised under the relevant contexts, mirroring the spherical categorisation discussed above,[701] as follows:

2.4.2 Economic context

In relation to the economic context in South Africa, the livelihood and employment component is a significant obstacle to urban resilience based on the understanding described above.[702] The severe structural and persistent poverty prevalent in South Africa, as alluded to above,[703] is one of the greatest hindrances to urban (climate) resilience in the country. Roughly 18.2 million people in the country are living in extreme poverty, with many living below the poverty line according to South African national standards.[704] Poverty traps are also persistent due to economic marginalisation, unemployment, unequal income levels, and the lack of or limited access to basic services.[705] Moreover, poverty in South Africa is described as systemic and embedded in the social fabric as one of the most pressing socio-economic problems of modern-day South Africa.[706] This means that poverty is characterised as more than just a lack of monetary and financial means.[707] Furthermore, poorly managed urban sprawl and lacklustre economic growth can exacerbate poverty and lead to further unplanned and unsafe expansion of informal

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699 See more on government regulation in para 3.2 below.
700 See paras 2.2 and 2.3 above.
701 See para 2.3 above.
702 See para 2.3.1 above.
703 See para 2.4.1 above.
704 The poverty line according to South African national standards is calculated on the consumer price indices (CPI) of both food and non-food items, and individuals having less than R760 per month available for food are considered to live under the poverty line. See Cowling 2023 https://www.statista.com/statistics/1127838/national-poverty-line-in-south-africa/.
705 IUDF 23; South African Human Rights Commission (SAHRC) and UN Children's Fund (UNICEF) *Poverty Traps and Social Exclusion among Children in South Africa* 10-11; The World Bank *Overcoming Poverty and Inequality in South Africa* xiv-xix.
706 Knox-Mosdell *A Constitutional Law Perspective on Structural Poverty in South Africa* 25.
707 Knox-Mosdell *A Constitutional Law Perspective on Structural Poverty in South Africa* 25; Nkosi *Poverty Levels and Poverty Alleviation Policy on the Urban Periphery* 14.

settlements.[708] The continued human settlement and infrastructure development in unsafe and hazardous areas increases the risk and vulnerability of the poor to natural and human-made disasters.[709] Those living in poverty are unable to pay for the costs of basic services, and in many communities, there is also inadequate bulk service infrastructure and municipal capacity to support all households with basic services such as water supply and electricity.[710]

Additionally, climate-related challenges and impacts, such as the recurring floods and severe droughts experienced in many parts of the country,[711] disrupt existing livelihoods and employment sectors, such as agriculture, construction, and tourism, as well as employment opportunities.[712] Further complicating matters, is that the economy has not yet fully recovered from the devastating economic effect of the pandemic,[713] yet it is also faced with the impact of the persistent energy crisis that threatens livelihoods and employment as it hinders the growth of businesses; causes hikes in food prices and resource availability; causes unsafe conditions for produce, commuting, and access to water; and impedes the achievement of an inclusive economy that creates jobs and reduces poverty.[714] Besides these impacts, it also highlights the plight of poorer communities, including vulnerable groups such as women and children,[715] the youth, the unemployed, the homeless and those living in informal settlements, who are more vulnerable to the effects of climate change.[716]

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708 IUDF 12; Department of Cooperative Governance *IUDF Implementation Plan 2020-2025* 22; Van Niekerk 2018 *Town and Regional Planning* 69-70; The World Bank *Overcoming Poverty and Inequality in South Africa* 1-4; Auriacombe and Van der Waldt 2020 *Administratio Publica* 25.

709 IUDF 21-23; Satterthwaite *et al* 2020 *One Earth* 143-144; DEA *Climate Change Adaptation Perspective on Urban, Rural and Coastal Settlements in South Africa* 9-10; Madubula and Van Eeden 2024 *Jàmbá: Journal of Disaster Risk Studies* 1.

710 National Planning Commission date unknown https://nationalplanningcommission.wordpress.com/economic-infrastructure/. See also Ledger *Access to Basic Services* 5-20; NDP 161. See also para 2.4.3 below.

711 See para 2.4.3.1 below.

712 See Khwashaba *Vulnerability and Resilience in the Mopani District Municipality in a Changing Climate* 32-34; Mashiane *Assessing Climate Change Risk and Resilience of JSE-Listed Companies* 14.

713 See National Planning Commission *Ten-year Review of the NDP 2012-2022* 7-8.

714 The Presidency *State of the Nation Address by President Cyril Ramaphosa* 2; Stats SA *The State of Basic Service Delivery: In-depth Analysis of the Community Survey 2016 Data* 65-66.

715 See Fambasayi 2021 *Stell LR* 398.

716 The Presidential Climate Commission *A Framework for a Just Transition in South Africa* 2.

Several national policy documents have incorporated the goal of poverty alleviation, such as the Reconstruction and Development Program (RDP) (1994),[717] the NDP,[718] and the IUDF.[719] The IUDF envisioned, for example,

> Cities and towns that are dynamic and efficient, foster entrepreneurialism and innovation, sustain livelihoods, enable inclusive economic growth, and generate the tax base needed to sustain and expand public services and amenities.[720]

The IUDF emphasises the need for an enabling environment for economic growth and productivity and further underscores the importance of inclusive economic development for job creation, higher income generation, and the creation of viable communities.[721] In the IUDF, inclusive economic development ought to result in increased numbers and profitability of SMEs, productive and skilled people and networks, and the upliftment of communities through improved skills, services, work and livelihood opportunities, and living standards, which have arguably materialised in South Africa.[722]

Despite the policy levers in the IUDF and other national policy documents, the reality in South Africa proves to be in stark contrast to these goals, and economic development strategies are often considered negligible in comparison to the main tasks of service delivery by municipalities.[723] Arguably, the country has had inadequate economic growth and remains dependent on mineral-related exports, with an increase in skills- and capital-intensive production, while less labour-intensive sectors have weakened.[724]

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717 See item 1 of Gen Not 1954 in GG 16085 of 23 November 1994.
718 NDP 218.
719 See, for example, IUDF 7, 12, 23, 80, 112.
720 IUDF 82.
721 IUDF 83; Bureau for Economic Research *SA's Municipal Challenges and their Impact on Local Economic Development* 1.
722 IUDF 83; Bureau for Economic Research *SA's Municipal Challenges and their Impact on Local Economic Development* 1-2; Sihlobo 2021 https://tinyurl.com/yc8u4c43.
723 See Department of Cooperative Governance *Strategic Plan 2020 to 2025* 18; Kirsten and Fourie 2021 https://theconversation.com/municipalities-can-play-a-key-role-in-south-africas-economic-development-heres-how-169952.
724 Visagie and Turok "The Economic Landscape of South African Cities: Diversity across Space, Sector and Skills" 5.

Economic growth in South Africa is further inhibited by political instability and the prominence of state-owned entities (SOEs) that have, in the last couple of years, struggled to provide quality services and discouraged investment.[725] This comes at a cost to SMEs that have to face additional obstacles in the form of "excessive red tape, lack of adequate and reliable economic infrastructure, low service standards, deficient urban management and poor spatial quality."[726] In many urban areas in South Africa, cities also struggle with poorly maintained infrastructure that inhibits livelihoods, poor service delivery and, in the case of decrepit transport infrastructure, it frustrates access to safe, reliable, and diverse mobility options to and from employment opportunities.[727] This arguably also contributes to high transportation costs that impede job searching and employment in South Africa.[728] Safety concerns and crime further deter an enabling environment for economic growth, more so in the informal business sector, on which many South Africans depend for income due to high levels of unemployment.[729] Another important factor impeding the achievement of urban climate resilience in South African cities is the rising cost of living that threatens savings, investment and growth, and excludes many South Africans from the housing sector and drives them towards informal settlement options.[730]

Further to the above challenges, unemployment remains one of the biggest challenges in South Africa from a socio-economic perspective, with an unemployment rate of 32.4% in 2023[731] and an estimated increase to 33.5% in the

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725 SOEs such as the state power utility, Eskom, (which implemented higher levels of loadshedding and power outages on record due to its inability to produce enough megawatts to meet demand) can negatively affect employment rates as many businesses, often SMEs, struggle to remain operational due to the ongoing power/energy crisis. See Gumbi 2023 https://www.reuters.com/world/africa/south-africas-unemployment-rate-rises-329-q1-2023-05-16/; The World Bank 2023 https://www.worldbank.org/en/country/southafrica/overview; Department of Cooperative Governance *Strategic Plan 2020 to 2025* 18.

726 IUDF 84. See also Department of Cooperative Governance *Strategic Plan 2020 to 2025* 18; See also Auriacombe and Van der Waldt 2020 *Administratio Publica* 6.

727 See Bureau for Economic Research *SA's Municipal Challenges and their Impact on Local Economic Development* 1-2.

728 Miyajima "The Link between Social Grants and Employment in South Africa" 6.

729 IUDF 84.

730 National Treasury *Budget 2024 Speech* 3, 12, 16; National Treasury *Budget 2024 Review* 11.

731 The unemployment rate, cited here, measures the number of people actively looking for a job as a percentage of the labour force. See World Bank Group 2024 https://tinyurl.com/bdef43ve.

second quarter of 2024.[732] The high rate of unemployment also necessitates greater social grant expenditure. The majority of South Africans depend on social grants for their livelihood, whether as direct recipients due to old-age or disability grants (that make these recipients less likely to be employed) or indirect recipients benefiting indirectly from grants received by eligible family members.[733] Indirect recipients benefiting from these social grants are also less likely to be employed and seek employment opportunities, especially the youth.[734] The youth unemployment issue can also be attributed to limited job opportunities, lower skills and earnings, spatial inequality, and lack of basic education.[735] Moreover, in the absence of local employment opportunities and demand for required experience, young, highly qualified graduates or skilled youth will frequently relocate in search of opportunities.[736] Furthermore, a focus on skills may hide the necessity of generating lower-skilled positions that would be open to the typical person looking for work in a developing nation.[737] Unfortunately, the economy is also not inclusive in that it fails to benefit all family structures, poverty, unemployment and livelihood scenarios, such as *inter alia*, child-headed or skip-generation households.[738] Furthermore, the livelihood and job opportunity spectrum of the country is also suffering severely, as the already vulnerable job markets crashed in the face of the COVID-19 pandemic, as well as persistent power cuts due to the ongoing energy

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732 Stats SA 2024 https://www.statssa.gov.za/?p=17615; Trading Economics 2024 https://tradingeconomics.com/south-africa/unemployment-rate.

733 Miyajima "The Link between Social Grants and Employment in South Africa" 3.

734 Miyajima "The Link between Social Grants and Employment in South Africa" 12.

735 Miyajima "The Link between Social Grants and Employment in South Africa" 12-13.

736 The Presidency *Introducing the Presidential Youth Employment Intervention (PYEI)* 4; Mabunda and Frick 2020 *Journal of Vocational, Adult and Continuing Education and Training* 94-95.

737 The Presidency *Introducing the Presidential Youth Employment Intervention (PYEI)* 4-5; Visagie and Turok "The Economic Landscape of South African Cities: Diversity across Space, Sector and Skills" 20.

738 *Revised White Paper on Families in South Africa* (2021) (GN 586 in GG 44799 of 2 July 2021) 4.

crisis.[739] The country is reportedly the country with the highest rate of unemployment in the world.[740]

Contrary to the economic circumstances of metropolitan urban areas (which in many cases are not ideal), secondary cities, though equally important for the country's development because of their diversity, population and resources, do not have large economies and are often dependent on specific economic sectors.[741] Some of these sectors are vulnerable to economic or policy shocks, climate change and other natural disasters, and also suffer the consequences of poor municipal management. As such, many South Africans rely on climate-sensitive sectors for their livelihoods.[742] Agriculture, mining, and tourism, for example, are significant sectors of employment, particularly in rural, coastal, and cultural heritage areas.[743] Climate change can lead to reduced crop yields, damage to property, unsafe and hazardous environments, job losses, and income instability, impacting the livelihoods of especially vulnerable communities dependent on these sectors.

The vulnerable population, including low-income neighbourhood dwellers and disadvantaged groups, do not have fair access to employment opportunities, education, and training programmes to develop basic abilities, such as foundational skills like literacy and numeracy, in order to be able to effectively participate in the labour market.[744]

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739 Strauss *et al Rapid Country Assessment: South Africa - The Impacts from a COVID-19 Shock to South Africa's Economy and Labour Market* 2; OECD *Coronavirus (COVID-19) - From Pandemic to Recovery: Local Employment and Economic Development* 2; The World Bank 2023 https://www.worldbank.org/en/country/southafrica/overview. See also National Treasury *2023 Medium Term Budget Policy Statement Speech* 2.

740 Neufeld 2023 https://www.weforum.org/agenda/2023/02/unemployment-forecast-work-country/; World Population Review 2023 https://worldpopulationreview.com/country-rankings/unemployment-by-country; Trading Economics 2023 https://tradingeconomics.com/country-list/unemployment-rate.

741 These sectors include, for example, agriculture, mining, universities and higher education opportunities dependent on students for their economic stability, tourism in amongst other coastal cities or towns, areas with large conservation areas and animal conservation areas. See IUDF 85.

742 UNDP 2023 https://tinyurl.com/53bsww2h.

743 UNDP 2023 https://tinyurl.com/53bsww2h; Atkinson *Inequality and Economic Marginalisation: Creating Access to Economic Opportunities in Small and Medium Towns* 5.

744 The Presidency *Introducing the Presidential Youth Employment Intervention (PYEI)* 4.

Furthermore, the municipalities of such small or medium-sized cities often have weak strategic and spatial planning capabilities, inadequate municipal infrastructure and capacity, and poor infrastructure maintenance, all of which prevent them from expanding their economic base and fostering resilience to climate-related disasters.[745] This may lead to constrained livelihoods and a decline in activity and demand for these economic sectors, which, in turn, may result in urban areas attracting more job seekers from rural regions in search of employment opportunities. Rapid urbanisation can strain already vulnerable urban resources and infrastructure, making cities more susceptible to climate risks like water scarcity, along with existing challenges of inadequate housing, minimal job opportunities, and ultimately diminished livelihood.[746]

In terms of financial capacity in cities, reality shows that environmental or related issues are seldom adequately provided for in municipal budgets due to the prioritisation of other service delivery mandates and the deficits and challenges faced in departments serving those mandates, along with already restricted budgets and low revenue.[747] South Africa has attempted to move away from the welfare model focused on basic needs to a more neoliberal growth, employment and redistribution (GEAR) policy.[748] GEAR was created with the goal of achieving high rates of economic growth, expanding the private sector, increasing output and employment, achieving fiscal reform, and promoting trade and investment.[749] However, despite cities being considered drivers of the economy, they suffer from a widespread lack of finance for infrastructure and basic service delivery,[750] and many municipalities in South Africa focus their capital expenditure on water and

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745 See Marais *et al Rethinking LED: "Local Economic Development" in Intermediate Cities* 17; Du Plessis and Nel "An Introduction" 1-31 – 1-32, 1-37.

746 See paras 1.1 and 2.2.2 above.

747 NCCRWP 45.

748 Sihlongonyane and Iloanya "The Private Sector and Urban Governance in South Africa: The Engagement Nexus" 88.

749 Sihlongonyane and Iloanya "The Private Sector and Urban Governance in South Africa: The Engagement Nexus" 88.

750 Development Bank of Southern Africa (DBSA) 2023 https://www.dbsa.org/article/impact-municipal-infrastructure-basic-service-delivery-south-africa; Auditor-General South Africa (AGSA) date unknown https://mfma-2021.agsareports.co.za/pages/service-delivery-municipal-infrastructure; Ntjatsane *Financing of Infrastructure Maintenance in South Africa* 15.

sanitation, transport and other service delivery expenses.[751] Additionally, due to the significant funding needed for infrastructure investment, the revenue collected by municipalities in the form of rates and taxes is insufficient for this purpose.[752] This means, in effect, that municipalities do not have sufficient revenue to cover their mandates,[753] arguably "as a result of structural issues within the local government fiscal framework (LGFF) and the deteriorating macro-economic environment in which they operate".[754] This has resulted in municipalities using their allocated Local Government Equitable Share (LGES) to attempt to meet their expenditure instead of raising the necessary revenue from their own sources to capacitate them to deliver on their constitutional mandates and the expenditure that goes along with it.[755] While municipalities may generate their own revenue, the successes in this regard are unfortunately limited mainly to the metropolitan municipalities, whilst about two-thirds of municipalities are considered to be in financial distress, or dysfunctional to differing degrees.[756] Further constraints on the financial capacity of municipalities are caused by a stagnant, struggling and declining national economy that impacts both their own revenue capacity as well as intergovernmental fiscal transfers.[757] Furthermore, municipalities are required to report on their expenditure, and upon municipal auditing, there are often findings of unauthorised, irregular, fruitless and wasteful expenditure, which indicates high levels of financial mismanagement and non-compliance with municipal finance legislation.[758]

With regard to the local economy, the South African government, in the NCCRWP, states that the aim is to create an equitable, environmentally responsible, and

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751 SACN *State of City Finances Report 2020* 4; NCCAS 25.

752 SALGA *Municipal Innovative Infrastructure Financing Unlocking Infrastructure Financing to Accelerate Service Delivery Conference 2018* 9.

753 See s 139(5) of the MFMA that introduces the concept of "financial crisis" as "a municipality's failure to fulfil its mandate to provide basic services or fulfil its financial obligations [due to] its financial situation…" - Glasser and Wright 2020 *Law, Democracy and Development* 417-419.

754 SACN *State of City Finances Report 2020* 4.

755 SACN *State of City Finances Report 2020* 4, 6-7.

756 National Treasury *System of Capacity Building for Local Government: Diagnostic Review* iii, 3-4; Glasser and Wright 2020 *Law, Democracy and Development* 419.

757 SACN *State of City Finances Report 2022* 7.

758 Wright *Legal Perspectives on the Prevention and Minimisation of Corruption for Sustainability in South African Municipalities* 138; SACN *State of City Finances Report 2022* 41.

climate-resilient economy as a means of combating the effects of climate change.[759] According to the National Treasury, resilience is essential to the sustainability of cities, whilst effective urban administration is a prerequisite for creating more productive, inclusive, and sustainable cities.[760] In order to address its economic, social, and environmental challenges in the country's cities, townships, and rural regions, South Africa adopted the objectives of a "green economy" as a means of achieving sustainable development and enhancing resilience to climate change.[761] This objective includes the formulation and implementation of growth and development strategies and initiatives for a transition away from carbon-intensive sectors and job creation in green sectors to limit economic vulnerability and unemployment, and job losses.[762] However, sustainable and resilient alternatives for infrastructure and local economic development are not adequately incorporated in South African cities as of yet, as these may require major structural changes and financial and human resource capacity.[763]

South Africa has a substantial informal sector, providing livelihoods for many urban residents. Informal trading and businesses are often subjected to restrictions and attempts at formalisation instead of accommodation and support, despite the significant role they play in city economies.[764] The informality does not merely happen at street level in cities but extends to decaying buildings where informal settlements are likely to form. Informal settlements situated at the peripheries of cities close to possible work opportunities in the city, as city living are considered synonymous with expensive and exclusionary accommodation options.[765]

2.4.3 Social context

In terms of the service delivery component of the social context, South Africa is rife with service delivery issues and resource constraints, and vulnerability is therefore

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759 NCCRWP 5.
760 National Treasury *Financing A Sustainable Economy: Technical Paper - Draft* 4.
761 NCCRWP 34.
762 NCCRWP 34-35.
763 Auriacombe and Van der Waldt 2020 *Administratio Publica* 2-6.
764 Dlamini "Introduction" 3-4; IUDF 85.
765 IUDF 85. See also para 2.4.1.1 above.

very dominant in its cities. This is evidenced by the excessive amount of public sector service delivery protests that took place over the years leading up to this study, highlighting the disparity with adequate service delivery in cities in the country.[766] Citizens frequently use protests as a means of public participation and a platform or "invented space" outside of the conventional and formal channels of participation, to engage government and voice their discontent with the state of affairs regarding service delivery deficits.[767] Protests over service delivery have brought to light significant gaps in government planning, institutional and leadership weaknesses, strained intergovernmental relations, inadequate performance monitoring and evaluation systems, and a failure to promptly and effectively address citizens' concerns about service delivery.[768] Though the purpose, mandate, and authority of the different spheres of government vary, local government is the sphere where the majority of government services are experienced regardless of who is responsible for the delivery of the particular service, which places local governments in a precarious position regarding the citizens' perceptions of (dis)satisfaction.[769] Evidently the uptake of such protests shows that citizens are growing increasingly impatient with the state of affairs regarding the slow pace of service delivery and the concomitant socio-economic challenges they have to face.[770]

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766 It was reported that over 900 protests related to service delivery issues took place from August 2020 to the end of January 2021 alone - Martin 2021 https://www.defenceweb.co.za/featured/900-service-delivery-protests-in-south-africa-over-six-months/. See also Masiya, Davids and Mangai 2019 *Theoretical and Empirical Research in Urban Management* 20-21; Reddy 2016 *The Journal for Transdisciplinary Research in Southern Africa* 1; Stoffels and Du Plessis 2019 *SAPL* 2-3; Mamokhere 2023 *Insights into Regional Development* 60-61; Thusi, Matyana and Jili 2023 *Journal of Studies in Social Sciences and Humanities* 137-138.

767 Masiangoako, Khunou and Potter 2022 *H_2Open Journal* 100.

768 See Roets and Ngamlana *A Brief Overview of an Assessment of Social Accountability and Service Delivery Monitoring Tools in South Africa* 3; Breakfast, Bradshaw and Nomarwayi 2019 *African Journal of Public Affairs* 107-108.

769 Roets and Ngamlana *A Brief Overview of an Assessment of Social Accountability and Service Delivery Monitoring Tools in South Africa* 19.

770 Roets and Ngamlana *A Brief Overview of an Assessment of Social Accountability and Service Delivery Monitoring Tools in South Africa* 3.

Still, many parts of the country are facing an acute urban water crisis,[771] a housing crisis,[772] and a continuing energy crisis,[773] among other socio-economic service delivery demands.[774] The water crisis is one that has been plaguing South Africa for more than a decade as access to adequate water services is a justiciable right in the Constitution,[775] and while there has been significant investment in water resources and water service infrastructure and an increase of access to piped water and access to water services in dwellings, many South Africans still lack access to this basic service.[776] In more recent years, this lack of access was largely attributed to severe droughts experienced in many parts of the country, with droughts being declared a national state of disaster until as recently as 2020.[777] Moreover, the broader scope

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771 Notwithstanding the recovery from "day-zero" in Cape Town, other parts of the country now have severe water supply constraints and has implemented what is termed "water shedding" or intermittent water supply in Nelson Mandela Bay Metropolitan's Gqeberha (previously "Port Elizabeth" in the Eastern Cape) and more recently in Gauteng, especially in the Johannesburg metropolitan area, and in Mpumalanga. See Cullis *et al The City Water Resilience Approach City Characterisation Report: Gqeberha* 9-10; Sheridan 2024 *South African Journal of Science* 1-2; Luyaba *et al* 2024 *South African Journal of Science* 1; World Resources Institute 2023 https://www.wri.org/update/south-african-cities-show-commitment-accelerate-water-resilience-2023-un-water-conference; Department of Water and Sanitation (DWS) *National Water and Sanitation Master Plan - Volume 1: Call to Action – Ready for the Future and Ahead of the Curve* 1-2; South African Government 2024 https://www.gov.za/news/media-statements/water-and-sanitation-calls-residents-use-water-sparingly-lowveld-dam-levels; South African Government 2024 https://www.gov.za/news/media-statements/water-and-sanitation-urges-residents-use-water-sparingly-dams-record-another; Proude 2024 https://www.swpn.org.za/2024/06/20/gautengs-water-crisis-collaborative-solutions-needed-to-secure-gautengs-water-future/; Mnisi date unknown https://hsf.org.za/publications/hsf-briefs/water-scarcity-in-south-africa-a-result-of-physical-or-economic-factors.

772 See para 2.4.2 above.

773 The energy crisis persists even though Eskom has not implemented rotational loadshedding (planned power cuts) since late March 2024, after having plagued South Africans since 2007 and getting worse since 2022 with an estimated 289 days' equivalent duration during 2023. The improvement in electricity supply has been attributed to improvements in the management of the national power utility Eskom, and high-level political support from the President and the Minister of Electricity, with changes in the energy portfolio to move away from relying on coal and fossil fuels and moving to green energy alternatives. See World Bank Group 2024 https://www.worldbank.org/en/country/southafrica/overview#1; Payton 2024 https://african.business/2024/08/energy-resources/cautious-optimism-in-the-energy-sector-as-south-africas-new-government-takes-office; Makaula 2024 https://mg.co.za/thought-leader/2024-07-16-a-pivotal-moment-for-south-africa-energy-crisis-climate-action-and-inclusive-governance/.

774 See Du Plessis and Fuo 2024 *South African Journal of Science* 1; Biljohn and Magaiza 2024 *South African Journal of Science* 1-2.

775 Section 27(1)(b) of the Constitution provides that everyone has the right to have access to sufficient water.

776 Masiangoako, Khunou and Potter 2022 *H_2Open Journal* 99.

777 GN 243 in GG 43066 of 4 March 2020; Herman 2018 https://www.news24.com/News24/breaking-drought-declared-a-national-disaster-20180313;

of the water crisis includes water scarcity, the unsustainable use and management of available water resources, water source pollution, sanitation services and sewerage management, as well as broader issues affecting water services infrastructure, such as ageing, unsafe, wasteful, and dilapidated infrastructure.[778] In addition, there are remnants of the droughts of the past couple of years that have a lasting effect on not only the health and well-being of South Africans, but also the food and water security and economic sectors, through lower crop yields that may be exported to other countries and that may be sold in the local economy.[779] The decrease in resource availability has run-on economic effects, in that it raises the living costs of consumers, causes mark-ups on product prices and fuel and oil prices, weakens the interest rate, and causes inflation. Again, in many instances, the most vulnerable of the population bear the brunt of these effects, especially those already living under the poverty line.[780]

The energy crisis, in particular, received a lot of concern and attention in the past few years as load shedding has been implemented at higher stages, and reached a point where stage six load-shedding was implemented, which is evidenced in two- to four-hour Scheduled load-shedding periods.[781] The electricity deficit and resultant load-shedding have negatively impacted service delivery and threatened the survival of many businesses from an economic and livelihood, and employment perspective.[782] The energy crisis became so prominent that it necessitated the declaration of a national state of disaster and the appointment of a Minister of Electricity in the Presidency to oversee all aspects of the electricity response.[783] Though many of the applicable policy documents mention a transition to a green economy that is less reliant on coal-based energy generation, little has been done

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Sgqolana 2021 https://www.dailymaverick.co.za/article/2021-07-21-worst-in-100-years-drought-in-all-three-cape-provinces-declared-a-national-disaster/.

778 See Steyn *The Realisation of the Constitutional Water Right in South African Cities through Intelligent Water Management Technologies* 127-128; Masiangoako, Khunou and Potter 2022 *H_2Open Journal* 100; Steenkamp *City-Level Law and Governance of Water Security in South Africa* 21.

779 SACN *Synthesis Report: Analysing Cities' Climate Change Resilience* 8.

780 See para 2.4.2 above.

781 Moyo *The Legal Autonomy of Municipalities in Energy Governance in South Africa* 8.

782 National Treasury *Budget 2023 Speech* 4.

783 The Presidency *State of the Nation Address 2023 Summary* 4-5.

to realise this at a significant scale, and Eskom is still responsible for the majority of South Africa's energy generation, transmission and distribution.[784] The energy crisis has recently been declared a national state of disaster,[785] and provision has been made for independent alternative energy generation through independent power producers (IPPs) where municipalities have capacity to utilise such producers.[786]

In terms of health care and emergency services, South Africa has the *National Health Act* 61 of 2003,[787] provides that provincial departments of health are responsible for the provision of healthcare services, while the national department is in charge of policy formulation, monitoring, evaluation and oversight of the sector, as well as the management and support of provincial departments.[788] In line with the provisions set out in the Constitution in Schedule 4B, the NHA also provides that municipal health services include a range of duties such as water quality monitoring, food control, waste management, health surveillance of premises, the surveillance and prevention of communicable diseases, vector control, environmental pollution control, disposal of the deceased, and chemical safety.[789] Emergency services, under which firefighting services and other organs of state involved in disaster management, the private sector, communities and individuals needed to mobilise, must organise and provide relief measures during or after a disaster, but are often also struggling to ensure effective health and emergency services due to dilapidated road infrastructure and safety issues caused by insufficient resources and protective equipment.

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784 Du Plessis 2015 *South African Journal of Science* 3; Moyo *The Legal Autonomy of Municipalities in Energy Governance in South Africa* 7.

785 Ndenze 2023 https://www.parliament.gov.za/news/president-ramaphosa-declares-national-state-disaster-electricity-crisis. The state of disaster was implemented during the State of the Nation Address on 9 February 2023, after which government adopted regulations "to mitigate the impact of severe load shedding, prevent the escalation of electricity supply constraints, and avert a national emergency". Department of Cooperative Governance 2023 https://www.gov.za/news/media-statements/government-terminates-national-state-disaster-%C2%A0electricity-supply-constraints. As stated above, the state of disaster was subsequently terminated in April 2023.

786 Moyo *The Legal Autonomy of Municipalities in Energy Governance in South Africa* 7.

787 61 of 2003 (NHA).

788 NHA; Department of Health (DoH) 2021 https://www.gov.za/about-sa/health.

789 Section 1 of the NHA.

The public sector, through public health establishments, is the main provider of health care services in the country, used by the diverse populace; however, a majority of people that make use of public health services form part of vulnerable and disadvantaged groups, which highlights the need for accessible and sufficient quality health services.[790] The recognition of healthcare as a fundamental human right in the Constitution[791] has led to the creation of the *National Health Insurance (NHI) Bill* (B11-B 2019) and the subsequent enactment of the *NHI Act*,[792] which aims to "provide universal access to quality healthcare for all South Africans."[793] The country's healthcare system faces a plethora of challenges, such as limited capacity to deliver primary care to outlying communities, governance and management failures, shortages in respect of skilled healthcare workers and dire conditions in some state hospitals.[794] These challenges were exacerbated during the COVID-19 pandemic when a surge in admissions to healthcare facilities caused capacity overloads and necessitated offsets and restrictions in other sectors.[795] The COVID-

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790 McIntyre and Ataguba *Access to Quality Health Care in South Africa: is the Health Sector Contributing to Addressing the Inequality Challenge?* 7-10.

791 See s 27 of the Constitution.

792 20 of 2023 (NHIA).

793 See Parliament of South Africa 2023 https://www.parliament.gov.za/project-event-details/54. While it is a laudable goal and attempts to ensure healthcare for all, there are a range of criticisms raised against the Fund envisioned by the Act, such as that that such a fund is unaffordable in the South African context and will require an increase in taxes to produce revenue for the fiscus to be able to fund such a movement, there is also arguably a lack of clarity regarding the nature and scope of healthcare benefits to be offered under the NHI, damning public sector challenges that include that most state or public hospitals are not compliant with the necessary Office of Health Standards Compliance (OHSC) which would require substantial investment to improve the public sector infrastructure, impacts on the existing shortages of healthcare workers and foreseen numeration challenges, impacts on the sustainability and affordability of medical schemes, favourable or exclusive contracting arrangements with preferred providers that might exclude competitive providers, and harm to the idea of competition law. See, for example, Cliffe Dekker Hofmeyer 2024 https://www.cliffedekkerhofmeyr.com/news/publications/2024/Sector/Healthcare/healthcare-pharmaceuticals-alert-5-June-the-goals-timing-and-criticisms-of-the-nhi-act; Prinsen 2023 https://www.ufs.ac.za/templates/news-archive/campus-news/2023/july/the-pros-and-cons-of-the-national-health-insurance-(nhi)-bill; Chothia 2024 https://www.bbc.com/news/articles/c1030v3p1r8o; Legardien 2023 https://www.dailymaverick.co.za/opinionista/2023-06-14-the-origins-of-opposition-to-the-nhi-are-rooted-in-the-bigger-problems-of-trust-and-competence/; Prinsen 2024 https://www.timeslive.co.za/ideas/2024-05-14-opinion-the-pros-and-cons-of-the-national-health-insurance-bill/.

794 Burger and Christian 2020 *Health Economics, Policy and Law* 45; Investec 2020 https://bit.ly/39lZFBU; McIntyre and Ataguba *Access to Quality Health Care in South Africa: Is the Health Sector Contributing to Addressing the Inequality Challenge?* 11.

795 Bulled and Singer 2020 *Global Public Health* 1238.

19 pandemic brought the importance of health services and emergency workers to the forefront of the discussion on emergency services and disaster preparedness. This pandemic also aptly illustrated the unpreparedness and inadequacy of the country's health and emergency response system in the face of a full-blown disaster. During the pandemic, healthcare and emergency service workers experienced severe stress and mental health challenges from being overworked and in constant danger due to hospitals teeming with patients infected with the virus, in competition with those with other serious conditions that required hospitalisation and emergency care.[796] Further exacerbating this stress, the personal protective equipment (PPE) in the country was insufficient to enable these emergency and healthcare workers to do their jobs without undue exposure to the virus.[797] The situation was also worsened by rampant corruption and abuse, and maladministration of funds allocated to dealing with the pandemic.[798] Furthermore, the pandemic initiated lockdowns and limitations on movement in public and caused limited access to healthcare facilities due to hospitals' reduction of non-urgent admissions and led to a severe mental health decline as people were suddenly isolated and restricted.[799] It also led to misdiagnoses or low detection rates for other illnesses, such as tuberculosis, caused supply chain disruption for medical supplies and drugs, and resulted in medication and treatment being inaccessible due to the restrictions.[800]

Even before the impact of the COVID-19 pandemic, South Africa was severely affected by the tuberculosis and HIV/AIDS epidemics and a large portion of citizens, especially from vulnerable groups and rural communities suffer from these diseases, along with other immune deficiencies and comorbidities, such as cholera and other respiratory diseases, for example.[801] The last-mentioned is often attributed to air pollution and may also relate to climate change, albeit indirectly, if persons live close to coal-powered power plants, coal mines, petroleum refineries, and other industrial emitters. A notable example is the Mpumalanga Highveld Priority Area, where

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796 Mbunge 2020 *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 1812.
797 Mbunge 2020 *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 1812.
798 Mbunge 2020 *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 1813.
799 Mbunge 2020 *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 1810-1811.
800 Nachega *et al* 2021 *International Journal of Infectious Diseases* 19.
801 Nachega *et al* 2021 *International Journal of Infectious Diseases* 17.

communities have been exposed to such dangerous levels of air pollution that the High Court ruled that it infringed the human rights of communities.[802] Other aggravating challenges to health and well-being, especially in the face of climate-related disasters and concomitant diseases, include the triple burden of disease and the widespread informality of the country, both in terms of housing and trade, which makes dealing with health and emergency states of disaster more difficult.[803] Other challenges befalling health care and emergency services are issues of access and affordability, especially by impoverished and vulnerable groups, and those situated in underdeveloped rural areas that have to use unreliable, unsafe, and crumbling public transport systems to reach health care facilities.[804]

This component relates closely to access to information and public participation.[805] Local government has a social responsibility to ensure inclusivity, community engagement, social protection, and the provision of basic social services based on the ideals of equity, equality, and the realisation of human rights.[806] In South Africa, community structures are supported and participation platforms exist, *inter alia*, in the form of public participation in decision-making by local government.[807] Public participation is aimed at promoting democratic and accountable government alongside the political rights of citizens provided for in the Constitution.[808] The efficacy and inclusivity of such platforms are a highly contentious debate, and it is unclear whether the voices and needs of communities are heard and considered.[809] Though the current efficacy of such platforms is debated, there are efforts to elevate the voices of communities through multi-sectoral and multi-stakeholder collaboration that includes community organisations, civil society and citizen

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802 See paras 10, 39-46 of *Trustees for the time being of Groundwork Trust v Minister of Environmental Affairs* 2022 ZAGPPHC 208.

803 Burger and Christian 2020 *Health Economics, Policy and Law* 44; Nachega *et al* 2021 *International Journal of Infectious Diseases* 17.

804 Burger and Christian 2020 *Health Economics, Policy and Law* 52.

805 See para 2.4.2 above.

806 See para 2.3.2.3 above.

807 See chapter 4 of the MSA.

808 See ss 19, 152(1)(a) and 195(e) of the Constitution. See also Fuo 2015 *African Human Rights Journal* 172.

809 Fuo 2015 *African Human Rights Law Journal* 174.

mobilisation.[810] South Africa also has a turbulent history with service delivery protests that arguably indicate that its citizens do not consider the participation platforms available to them adequate, instead mobilising informal community structures to protest and demonstrate their dissatisfaction with service delivery.[811]

In respect of collective identity and community structure and participation, the *White Paper on Local Government* (1998), the *Local Government: Municipal Structures Act* 117 of 1998 (the Structures Act), the MSA, as well as several sections of the Constitution provide for community participation in decision-making processes of government.[812] In terms of this legislative framework, government is obliged to have public participation processes to allow the community to provide inputs and comment on legislative and executive processes.[813] Section 16 of the MSA, for example, also determines that municipalities must use their resources and allocate funds in their budget for enhancing the capacity of communities, municipal councils and municipal officials.[814]

2.4.4 Environmental context

2.4.4.1 Natural environment

South Africa is a diverse country with a unique and complicated geography, consisting of eight biomes, namely, Grassland, Savanna, Succulent Karoo, Nama Karoo, Forest, Fynbos, Desert, and Thicket.[815] The country has a sub-tropical climate, and temperatures on the east and west coasts differ significantly due to the warm Agulhas and cold Benguela currents along their respective shorelines.[816]

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810 See, for example, Satterthwaite 2013 *Environment and Urbanization* 383.

811 See para 2.4.2.1 above; Masiangoako, Khunou and Potter 2022 *H_2Open Journal* 100.

812 See *White Paper on Local Government* (1998); s 19 of the *Local Government: Municipal Structures Act* 117 of 1998 (Structures Act); s 16-22 of the MSA; s 152(1)(a) and (e) and 195(1)(e) of the Constitution. See also COGTA 2020 https://bit.ly/3tSY3ZT; Fuo 2015 *African Human Rights Law Journal* 172-173.

813 See ss 152(e) and 195(1)(e) of the Constitution; Long title and ss 16-22 of the MSA; s 19(1)(c) of the Structures Act.

814 Section 16(1)(b) and (c) of the MSA.

815 Mukhawana, Kanyerere and Kahler 2023 *Water* 3-4; Sell *et al* "Unique Southern African Terrestrial and Oceanic Biomes and Their Relation to Steep Environmental Gradients" 26.

816 World Bank Group 2021 https://tinyurl.com/bdef43ve; DFFE 2024 https://soer.environment.gov.za/soer/CMSWebSite/Content.aspx?menuId=15987,15987.

The country is considered to be semi-arid to arid and is largely a summer rainfall region, save for the Western Cape, which has most of its rainfall in winter.[817] The country has a highly variable climate and faces highly constrained freshwater resources and locational droughts and flooding that lead to severe water insecurity, especially in Gauteng, the Western Cape and Eastern Cape.[818] The past few years have seen large parts of South Africa, including the Eastern Cape,[819] Northern Cape, KwaZulu-Natal, and Western Cape, face severe droughts due to delayed rainfall and decreasing dam levels.[820] In contrast, as previously alluded to, other parts of the country have been faced with increased rainfall and floods.[821] These weather variabilities have caused significant vulnerability and increased risk of, *inter alia*, climate-related disasters, risk to the safety of certain communities, and threats to the health and well-being of citizens.[822]

Urban areas in South Africa are dense spaces filled with impenetrable surfaces laid out haphazardly due to old planning regimes and unsustainable development trajectories. There has been considerable attention in recent years to urban ecology that incorporates aspects of the environment into city spaces to enhance ecosystem

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817 World Bank Group 2021 https://tinyurl.com/bdef43ve; South African Government 2023 https://www.gov.za/sites/default/files/gcis_document/202403/yb2023.pdf.

818 Water Research Commission *Background to current drought situation in South Africa* 1; Helen Suzman Foundation 2024 https://hsf.org.za/publications/hsf-briefs/water-scarcity-in-south-africa-a-result-of-physical-or-economic-factors; Hosea and Khalema 2020 *Town and Regional Planning* 22-24; South African Government 2023 https://www.gov.za/sites/default/files/gcis_document/202403/yb2023.pdf; Mukhawana, Kanyerere and Kahler 2023 *Water* 1-2; Steenkamp *City-level Law and Governance of Water Security in South Africa* 3.

819 See Apraku *et al* 2023 *Scientific African* 2-4; Saunders *The South African regulatory framework for urban drought risk management* 65-66.

820 The droughts experienced in South Africa since 2015 have been classified as the worst drought the country had to face since 1982 – Bahta and Myeki 2022 *Agriculture* 9. See also Allison 2015 https://tinyurl.com/nhkujz94; BBC 2015 https://www.bbc.com/news/world-africa-34884135; UN-WFP 2024 https://www.wfp.org/news/urgent-call-action-address-historic-el-nino-drought-southern-africa; Water Research Commission (WRC) *Climate Change Impacts on Water Resources: Implications and Practical Responses in Selected South African Systems* 40-41; South African Government 2023 https://www.gov.za/sites/default/files/gcis_document/202403/yb2023.pdf; Mukhawana, Kanyerere and Kahler 2023 *Water* 1-2; Saunders *The South African Regulatory Framework for Urban Drought Risk Management* 19-20.

821 See Madubula and Van Eeden 2024 *Jàmbá: Journal of Disaster Risk Studies* 2.

822 See DEFF NCCAS 9.

services in response to climate change.[823] There is some level of green infrastructure in South African urban areas in the form of protected areas,[824] urban green spaces,[825] green walls and roofs,[826] street trees, and community gardens.[827] These areas can serve multifunctional purposes of both acting as an NBS for providing vegetation and feeding vulnerable communities, as wetlands that can serve as carbon-sinks, as a means to address microclimate regulation, to serve as recreation areas, and act as a buffer in tumultuous weather extremes in built-up areas.[828]

Per illustration, South African cities have, in recent years, faced extreme disasters because of climate-related impacts across a range of sectors such as energy, transport, agriculture, forestry, water resource management, provision of water services, and health.[829] Examples of the disasters include the devastating 2022 floods in KwaZulu-Natal, which resulted in a number of fatalities and damage to

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823 See Pasquini and Enqvist *Green Infrastructure in South African Cities* 5-7; Mngumi 2020 *Landscape and Ecological Engineering* 187; Du Toit and Cilliers "Urban Ecology" 20-7 – 20-12; African Climate & Development Initiative (ACDI) 2020 https://acdi.uct.ac.za/acdi-research/green-infrastructure-climate-adaptation-peri-urban-areas.

824 "Protected environments may arguably be established in urban areas for purposes of regulating an area as a buffer zone for the conservation and protection of a protected area." - Botes *Legal Protection of 'Microclimate Regulation' as an Urban Ecosystem Service in South Africa* 61. Furthermore, protected areas may be declared as such if they are deemed sensitive to development based on their biological diversity; natural characteristics; scientific, cultural, historical, archaeological or geological value; or scenic and landscape value and such areas may also be listed as threatened or vulnerable in terms of the NEMBA. See ss 28 and 35(1) of NEMPAA; ss 52(2)(a) and 56 of the NEMBA.

825 Greenstone 2023 *African Journal of Inter/Multidisciplinary Studies* 1-2; Van Zyl *The Integration of Urban Planning and Urban Ecology: Investigating Multifunctionality and Ecosystem Services* 39-40.

826 Greenstone 2023 *African Journal of Inter/Multidisciplinary Studies* 1-3.

827 See Botes *Legal Protection of 'Microclimate Regulation' as an Urban Ecosystem Service in South Africa* 37-42; Du Toit and Cilliers "Urban Ecology" 20-8; Prinsloo, Reilly and Myburgh 2021 *South African Journal of Science* 1-2.

828 WWF SA *Making the Case for Investing in Nature-based Solutions* 4; Naicker, Rouget and Mutanga 2016 *Bothalia-African Biodiversity & Conservation* 1-2; Jewitt *et al* 2015 *South African Journal of Science* 1, 6-8. See also Du Toit, Du Preez and Cilliers 2021 *Bothalia – African Biodiversity & Conservation* 2.

829 Odeku and Meyer 2010 *Journal of African Law* 159.

vital infrastructure,[830] and the dire water crisis facing Nelson Mandela Bay as a result of an extended drought and rising water demand, among others.[831]

Some of the country's most pressing environmental issues concern water, food and energy security, as well as declining and deteriorating biodiversity and natural resources. According to the *National Biodiversity Assessment 2018*, estuarine and inland wetlands are severely threatened, coastal biodiversity assets are at risk, and there have been rapid declines in some of the country's species, with freshwater fish species being the most threatened species in the country.[832] In terms of water resources, the country is experiencing decreased water supply as a result of, *inter alia,* climate change, degradation of wetlands and other water resources, water losses and increased demand due to population and economic growth, aged infrastructure and poor maintenance.[833] Furthermore, the country's diverse biodiversity has multiple other benefits, such as job creation, providing ecosystem services (i.e., benefits to humans and nature) such as water and food security, as well as providing a measure of protection against climate hazards by acting as buffering zones.[834] Another threat to the health of South Africa's natural environment is biological invasions through the introduction of alien invasive species that are, in many instances, resource-intensive and threaten indigenous species.[835]

Built-up urban areas are often bare of NBS that can assist in the delivery of ecosystem services such as microclimate regulation services, flood barriers, water

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830 See Parliament *Report of the Ad Hoc Joint Committee on Flood Disaster Relief and Recovery* 21-24; Bouchard *et al* 2023 *Annales Me'dico-Psychologiques* 236; KwaZulu-Natal Province 2022 https://www.kzncogta.gov.za/archives/7486; Nyoka 2022 https://www.bbc.com/news/world-africa-61092334.

831 Mkentane and Furlonger 2023 https://www.businesslive.co.za/bd/national/2023-03-21-nelson-mandela-bay-water-crisis-imperils-metros-economy/; Matavire 2023 https://mg.co.za/news/2023-03-13-battle-for-water-in-dry-nelson-mandela-bay/; Nelson Mandela Bay Tourism 2022 https://www.nmbt.co.za/news/notice_water_shortage_in_nelson_mandela_bay.html; DFFE 2024 https://soer.environment.gov.za/soer/CMSWebSite/Content.aspx?menuId=15987,15987.

832 See SANBI *National Biodiversity Assessment 2018* 2.

833 Department of Water and Sanitation *National State of Water Report 2021* 1.

834 SANBI *National Biodiversity Assessment 2018* 2.

835 SANBI *The Status of Biological Invasions and their Management in South Africa in 2019* xv.

retention and purification.[836] These types of NBS can also contribute to improved water management and quality, food and water security job creation, greener cities, and reduced carbon emissions.[837] Yet, despite the potential they have for alleviating some of these issues, nature-based remedies are mostly unexploited amid the current environmental and climate crises.[838] Cities are threatened by climate change, informal urban expansion, and development, along with inadequate maintenance of infrastructure that substantially increases risk and vulnerability to floods and heat stress in built-up areas.

Another challenge cities face is the exorbitant amount of waste generated, so much so that many cities suffer from unsustainable, overburdened and dangerous landfill sites and severely inadequate waste management, factors that contribute to high GHG emissions and pose several health and safety risks to communities in the form of noxious gasses and respiratory diseases or seeping of pollutants into underground or surface water resources. Many informal settlements are also in such an environmentally degraded condition that amounts to infringement of the environmental constitutional right to an environment not harmful to health and well-being.[839] Additional pollution comes from the energy sector, which is responsible for the majority of the country's emissions, followed by the transport sector.[840]

Linking back to the importance of information dissemination and awareness, the lack of communication regarding the scope and importance of green public spaces inhibits the optimisation of such spaces in South Africa for urban climate resilience, along with capacity challenges relating to fiscal and human resources.[841]

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836 See Botes *Legal Protection of 'Microclimate Regulation' as an Urban Ecosystem Service in South Africa* 25.

837 WWF SA *Making the Case for Investing in Nature-based Solutions* 4.

838 See Van Zyl *The Integration of Urban Planning and Urban Ecology: Investigating Multifunctionality and Ecosystem Services* 39-40.

839 WWF SA *Making the Case for Investing in Nature-based Solutions* 6.

840 Department of Forestry, Fisheries and the Environment *The 7th National GHG Inventory Report 2000-2017* 10.

841 Cilliers, Cilliers and Lategan "Nature-Based Solutions for Public Green Spaces in Sub-Saharan Africa—Integrating Place-Making and Green Infrastructure" 92; Van Zyl *The Integration of Urban Planning and Urban Ecology: Investigating Multifunctionality and Ecosystem Services* 39-40.

2.4.4.2 Built environment

South Africa's land use planning and infrastructure is a remnant of those of the apartheid era. Subsequently, the combination of old and modernist or Westernised approaches to planning is unresponsive and inadequate to meet the needs of the current society and environmental challenges such as climate change and its effects.[842] They are also characterised by severe spatial inequalities and, consequently, severe vulnerability. Cities also experience the influence of politics in planning decisions, the impact of litigation and time constraints on planning, as well as a lack of skills to plan, implement and enforce effective spatial planning.[843]

Basic service infrastructure in South Africa is in a dire state in many parts of the country.[844] Many municipalities do not have the required infrastructure and capacity to deliver basic municipal services,[845] and in many instances, these functions are outsourced to the private sector or citizen movements to ensure that services are delivered.[846] In many cases, the basic service infrastructure is either old, outdated, not maintained or not suitable for the capacity it needs to carry. Many cities are also struggling with basic service delivery to informal settlements forming on city peripheries, as there is no infrastructure in place to accommodate the influx of more people, all demanding basic service delivery as provided for in the Constitution.[847]

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842 Forbes *An Introduction to Municipal Planning within South Africa* 2.

843 Forbes *An Introduction to Municipal Planning within South Africa* 18. The political environment has become even more complex thanks to coalitions being formed between some of the prominent parties to garner greater power.

844 AGSA 2022 https://mfma-2021.agsareports.co.za/pages/service-delivery-municipal-infrastructure; Makhathini, Mlambo and Mpanza 2020 *Strategic Review for Southern Africa* 102; Mamokhere 2022 *Commonwealth Youth and Development* 7; Rust *et al* 2021 *Journal of the South African Institution of Civil Engineering* 35; Patience and Nel 2021 *Africa's Public Service Delivery and Performance Review* 4; *The Unemployed People's Movement v The Premier, Province of the Eastern Cape* 2020 3 SA 562 (ECG) paras 84-85 (*Makana*-case).

845 AGSA 2022 https://pfma-2021-2022.agsareports.co.za/infrastructure-for-service-delivery/; Shongwe and Meyer 2023 *Administratio Publica* 139-144.

846 *Kgetlengrivier Concerned Citizens v Kgetlengrivier Local Municipality* 2023 2 All SA 452 (NWM) paras 1 and 7-10; Chonco 2021 https://dullahomarinstitute.org.za/multilevel-govt/local-government-bulletin/archives/volume-16-issue-2-september-2021/court-orders-national-government-to-leapfrog-into-lekwa-local-municipality.

847 Shongwe and Meyer 2023 *Administratio Publica* 150. See also *Mazibuko v City of Johannesburg* 010 4 SA 1 (CC); *Nokotyana v Ekurhuleni Metropolitan Municipality* 2010 4 BCLR 312 (CC).

Arguably, the biggest manifestation of the *status quo* of South Africa's critical and basic service infrastructure situation is the state of energy supply infrastructure, mainly consisting of coal-intensive power stations.[848] This infrastructure is, in many instances, inoperative or in need of serious maintenance and upgrading due to its age. This is impacting the livelihoods of South Africans on a daily basis due to implemented load shedding and scheduled power outages that have plagued South Africa for more than a decade, reaching their peak in 2022 and 2023.[849] Some areas in the country have also been faced with water restrictions in the past few years due to failing and malfunctioning basic water service infrastructure.[850]

The country also has a rapidly expanding fibre network and data centre market.[851] Communication infrastructure and access to internet services, mobile phone use and telecommunication via service providers and mobile subscriptions are, however, disproportionally better in big cities like the metros, causing unequal access to such services, digital participation, and access to information through the broadcasting sector for the urban poor or rural areas where connectivity is not as stable.[852] Furthermore, the unreliability of energy systems also incapacitates information and communication systems during persistent power outages.[853] While there are many different types of ICT infrastructure providing data for research and innovation, there is a skills deficit with regard to the use of such data and challenges, such as

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848 Directorate: Energy Economics and Statistics *The South African Energy Sector Report 2023* 5.

849 Akinbami, Oke and Bodunrin 2021 *Alexandria Engineering Journal* 5079; Directorate: Energy Economics and Statistics *The South African Energy Sector Report 2023* 29; Directorate: Energy Economics and Statistics *The South African Energy Sector Report 2022* 7. See also Mkhize 2022 https://www.bbc.com/news/world-africa-63513278; Payton 2023 https://african.business/2023/05/energy-resources/africas-race-for-transmission-investment; Harding 2023 https://www.bbc.com/news/world-africa-65671718; Nguyen 2023 https://earth.org/energy-crisis-south-africa/.

850 See DWS *National State of Water Report 2023* iii; Toxopeüs date unknown https://hsf.org.za/publications/hsf-briefs/understanding-water-issues-and-challenges-iv-water-infrastructure-assessment; South African Institution of Civil Engineering (SAICE) *SAICE 2022 Infrastructure Report Card for South Africa* 6-8.

851 Independent Communications Authority of South Africa *The State of the ICT Sector Report in South Africa 2020* 18.

852 Independent Communications Authority of South Africa *The State of the ICT Sector Report in South Africa 2020* 14.

853 Allen 2023 https://issafrica.org/iss-today/communication-blackout-impact-of-power-grid-collapse-on-ict; SAICE *SAICE 2022 Infrastructure Report Card for South Africa* 54.

inconsistent data sets across institutions that undermine the credibility of data.[854] As a result, it is difficult to gauge the *status quo* of some of the sectors prevalent in the generalised features.[855] This leads to an overreliance on existing, sometimes older, research, data, and statistics done by others, and often also focuses on metropolitan areas. Only recently have organisations such as SACN delved into data relating to intermediate or secondary and smaller cities and towns.[856]

In relation to communication and mobility, some cities in the country are more progressive than others and have multi-modal transport systems in the form of BRT systems,[857] and low-carbon alternatives, such as safer and more inclusive walking and cycling routes or lanes, public transport, minibus taxis, or electric vehicles.[858] In South Africa, some of these alternatives, such as walking and cycling lanes and low-carbon vehicles, for example, are out of reach at this stage because of factors such as safety concerns and high levels of crime, especially in CBDs of urban areas and affordability for the majority of the population.[859] Additionally, the transitions needed to incorporate such alternatives will also come at a high expense that municipalities and, most likely, even the national government, will not be able to bear in the current economic scenario. It is, however, important to acknowledge that some of the suggested transport systems do exist in some of the country's major cities. Cape Town, Durban and Johannesburg have BRT systems,[860] and railways (though in many instances, older infrastructure might be vandalised and unsafe or in need of

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854 SAICE *2022 Infrastructure Report Card* 20.

855 See, for example, DWS *National Water and Sanitation Master Plan* 6.

856 SACN *Secondary Cities in South Africa: The Start of a Conversation* 8; SACN *Outside the Core: Towards an Understanding of Intermediate Cities in South Africa* 24-33; SACN *Profiling Intermediate Cities in South Africa* 12; Donaldson, Marais and Nel "Secondary Cities in South Africa" 123-124.

857 Such as Johannesburg and Cape Town, which have BRT systems; however, these systems have other challenges that need to be considered when such systems are included in planning initiatives – see ITDP Africa 2021 https://bit.ly/3Czgtlz.

858 Van der Berg and Du Plessis "Shared Mobility towards Urban Climate Resilience in the City of Johannesburg" 327-328; Ahjum *et al A Low-Carbon Transport Future for South Africa: Technical, Economic and Policy Considerations* 2.

859 Van der Berg and Du Plessis "Shared Mobility towards Urban Climate Resilience in the City of Johannesburg" 328; Department of Transport *Green Transport Strategy for South Africa (2018-2050)* 8-9.

860 See Department of Transport *Green Transport Strategy for South Africa (2018-2050)* 18.

maintenance).[861] The taxi industry is also a main form of transport for many South Africans.[862] Gauteng province has also successfully established a speed train called the Gautrain that has several stations on a route from Pretoria to Johannesburg.[863]

2.4.5 Governance context

South Africa has extensive legislation and policies relevant to the law enforcement, crime prevention and rule of law aspects of resilience.[864] For crime prevention and law enforcement, South Africa has the South African Police Service (SAPS) and many cities, although mainly metropolitan cities, have municipal police departments.[865] The judiciary is situated as an independent branch of government, subject to the Constitution and aims to uphold the rule of law through a range of different courts.[866]

With respect to sound financial management, diverse revenue supply, and investment, South Africa is facing severe challenges related to corruption, maladministration, and wasteful expenditure.[867] Cities are no exception, as the Auditor-General report for 2023 to 2024 indicates that the finances of local governments are not being managed efficiently due to unreliable performance reporting, a lapse in oversight and lack of controls relating to compliance, a regression in audit outcomes, as well as unauthorised, irregular, fruitless, and wasteful expenditure.[868]

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861 See Van der Berg and Du Plessis "Shared Mobility towards Urban Climate Resilience in the City of Johannesburg" 329; Department of Transport *Green Transport Strategy for South Africa (2018-2050)* 18-19.

862 An estimated 68% of the population rely on minibus taxis as their main form of transport. See Department of Transport *Green Transport Strategy for South Africa (2018-2050)* 18.

863 Department of Transport *Green Transport Strategy for South Africa (2018-2050)* 19.

864 The Rockefeller Foundation and Arup *City Resilience Framework* 7.

865 Ekurhuleni Metro Police Department (EMPD), Johannesburg Metropolitan Police Department (JMPD), and Tshwane Police Department (Tshwane PD) are some examples of this.

866 Section 165 of the Constitution; South African Government 2021 https://www.gov.za/about-government/judicial-system.

867 Organisation Undoing Tax Abuse (OUTA) *Combating Corruption and Maladministration in the South African Public Sector* 11-14; Mishi, Mbaleki and Mushonga 2022 *Journal of Local Government Research and Innovation* 2-3; Mlambo, Simangele and Mpanza 2023 *Artha – Journal of Social Sciences* 2-3.

868 Auditor-General South Africa (AGSA) *Consolidated General Report on the Local Government Audit Outcomes - MFMA 2023-24* 4-7.

As alluded to above in the discussion of the social sphere, service delivery issues are rampant in South African cities – this is the symptom of a much greater concern.[869] The South African government itself has become an embodiment of corruption, lack of accountability of senior government officials, poor consequence management, biased application of the rule of law, cadre deployment, political instability and public mistrust, financial mismanagement, self-enrichment, questionable decision-making, inadequate policy reform and implementation, and falling victim to state capture.[870] This shows a serious lack of effective leadership and management and is further indicative of weak political will to promote sustainable service delivery, all to the detriment of the citizens.[871] There is a growing culture of non-payment for municipal services in South Africa, with many municipalities being in debt to service providers.[872] The non-payment culture stems from a range of factors, including a decreasing tax-payer-based income due to unemployment and increasing inflation not keeping track with the labour market, increasing property taxes, fuel levies and other circumstances that make residents default on payment to the municipality leading to reduced revenue and increased expenditure in the form of government subsidies and grants to indigents.[873] There is also a high percentage of municipalities that are subject to provincial intervention, with many municipalities having been placed under administration for maladministration of public funds.[874] The leadership in many municipalities is also under duress due to the current political climate and the instability and uncertainty of the coalition governments in charge of various cities.[875]

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869 See para 2.4.3 above.

870 Thusi, Matyana and Jili 2023 *Journal of Studies in Social Sciences and Humanities* 138.

871 Thusi, Matyana and Jili 2023 *Journal of Studies in Social Sciences and Humanities* 138.

872 National Treasury *MFMA Circular No. 49* 1; National Treasury *Municipal Debt Relief MFMA Circular No 124* 2-3.

873 Mishi, Mbaleki and Mushonga 2022 *Journal of Local Government Research and Innovation* 2; Mlambo, Simangele and Mpanza 2023 *Artha – Journal of Social Sciences* 2-3.

874 Wright *Legal Perspectives on the Prevention and Minimisation of Corruption for Sustainability in South African Municipalities* 138.

875 This has been prominent especially in Gauteng. See Pholoma *et al* 2024 *Journal of Local Government Research and Innovation* 1-2; Kariuki, Reddy and Wissink "Local Government Coalitions in South Africa in a Changing and Redefined Political Milieu and Context" 4-8; Booysen (ed) *MISTRA: Analysis of South Africa's 2024 Elections and the Coalitions Aftermath* 38.

Lastly, local governments in South Africa are required by law to do integrated developmental planning, which includes considerations of socio-economic and environmental aspects of planning and development, in line with the notion of sustainable development, and which can include the visions, strategies and plans of municipalities for a range of their mandates.[876]

Building on the categorical understanding and description of urban climate resilience outlined above, the following discussion seeks to distil and identify concrete, actionable features that can inform and enhance resilience strategies suitable for the South African urban context.

2.5 Actionable features for urban climate resilience

2.5.1 LED and sustainable livelihoods

Local governments play a critical role in fostering diverse livelihoods and employment opportunities at the city level. They can support entrepreneurship, attract investments, and create an enabling environment for businesses that contributes to climate resilience.[877] Government is arguably an "enabler of private sector and civil society through legal and institutional reforms that facilitate more effective cities."[878] Developmental local government depends on the facilitation of development and growth along with the private sector and society, in a way that is mutually beneficial, and fosters the achievement of development goals, while also ensuring enterprise viability through creating an enabling business environment, as mentioned above.[879] This can also lead to job creation and economic growth. As alluded to above,[880] inclusivity should also be prioritised in policies and initiatives for diversified livelihoods and employment possibilities.

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876 Section 35(1)(a) of the MSA. See also Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 158; Botes *Legal Perspectives on 'Microclimate Regulation' as an Urban Ecosystem Service in South Africa* 118-120.

877 SACN *Urban Governance Paper Series* 88.

878 Sihlongonyane and Iloanya "The Private Sector and Urban Governance in South Africa: The Engagement Nexus" 86; *NCCRWP* 39.

879 See para 2.4.1.1 above; Sihlongonyane and Iloanya "The Private Sector and Urban Governance in South Africa: The Engagement Nexus" 86.

880 See para 2.3.1 above.

The *NCCRWP* also advocates for the mainstreaming of climate change into fiscal budgetary processes, to allow proper integration of climate change response programmes at all spheres of government.[881] Municipalities may also build their own revenue through a variety of fiscal tools, such as property taxes, user fees for using municipal services, surcharges, fines, and other local levies, creating diverse revenue streams, leading to better resilience.[882]

Linked to the creation of jobs, particularly in climate-resilient sectors, there is a need for not only access to capital expenditure through municipal grants and infrastructure, but also a need for investment in education and skills development, as alluded to above.[883] This inherently requires individuals in the city space to be equipped with the knowledge and skills to participate in green industries and adapt to changes in the labour markets, and ensure that actions are specifically tailored to the best possible solution.[884] Fostering a more enabling environment can enable a diverse economy with diverse opportunities that are more resilient to economic shocks, including those triggered by climate events. In this vein, the *NCCRWP* provides the aim of climate change-resilient development that is needs-driven and customised to meet the special needs and circumstances of the most vulnerable, and that is cognisant of specific sectors and actors, and has significant mitigation and adaptation benefits for economic growth, job creation, and poverty alleviation, amongst others.[885] Moreover, by reducing the reliance on a single economic sector, South African cities will be able to better withstand disruptions caused by climate-related and other crises. The overreliance on a key economic sector such as mining, agriculture or tourism is especially problematic in secondary cities.[886] Diverse economic revenue streams and an improved business environment and support for SMEs are all ways for South Africa to foster investment opportunities and lead to

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881 See NCCRWP 38, 45.

882 Stats SA 2019 https://www.statssa.gov.za/?p=12033; SACN *State of City Finances Report 2020* 9.

883 See para 2.4.1.1 above.

884 *National Climate Change Response White Paper* 6.

885 *National Climate Change Response White Paper* 13.

886 Atkinson *Inequalities and Economic Marginalisation: Creating Access to Economic Opportunities in Small and Medium Towns* 5.

economic growth, which brings more opportunities and more avenues for income, such as property taxes.[887]

Strengthening the resilience of the informal economy is crucial as it serves to create a diverse economy and alternative input into the local and national economy.[888] This includes supporting informal businesses through training, access to finance, and climate-resilient infrastructure.[889] Additionally, sustainable local economic development is dependent on diverse local economies, as alluded to above, inclusive of economies that cater for and accommodate both the formal and informal sectors, SME development and support, and knowledge and skills development to contribute to the local economy through participation in the labour market, sufficient economic governance and infrastructure, and a strengthened local innovation system.[890]

2.5.2 Adequate basic services

Adequate service delivery, encompassing sustainable and continued and uninterrupted services, as a feature of urban climate resilience, is attainable through addressing resource deficiencies and promoting sustainable resource usage. This supports adequate, affordable, and sustainable delivery of water and sanitation services, waste collection and disposal services, health services, environmental services, housing, and energy provision, as well as access to emergency healthcare services.[891] This feature is heavily reliant on adequate infrastructure, without which these services cannot be rendered. Adequate infrastructure entails, *inter alia*, regular maintenance and upgrading of service delivery infrastructure, instead of when the infrastructure is on the verge of collapse.[892] Cities should have disaster mitigation and adaptation plans and measures in place to ensure access to basic

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887 Atkinson *Inequalities and Economic Marginalisation: Creating Access to Economic Opportunities in Small and Medium Towns* 5-6; SACN *State of City Finances Report 2022* 23.

888 See, for example, SACN *Township Economic Development in Gauteng Province: National and Provincial Law Perspectives* 1-4.

889 SACN *Township Economic Development in Gauteng Province: National and Provincial Law Perspectives* 3; SACN *Township Economic Development in Gauteng Province* 4; SACN *Urban Economies Papers* 45.

890 SACN *Rethinking LED:" Local Economic Development" in Intermediate Cities* 15; SACN *Township Economic Development in Gauteng Province* 4.

891 See paras 2.3.2.1 and 2.3.2.2 above.

892 See para 2.3.3.2 above.

services even in the face of disaster, along with emergency or disaster management and preparedness plans.[893] These measures might include smart technology like flood warning systems, water level measurements, drought indicators, etc.,[894] and other measures such as environmental conservation and ecosystem services protection to ensure water and food security and availability, limit diseases, and prevent pollution and waste from causing blockages in pipe networks and causing infrastructure failures.[895]

2.5.3 Inclusive community structures and processes

Inclusive community structures and processes can arguably be accomplished by creating accessible, diverse, and safe community participation, access to knowledge through awareness campaigns and education, and information platforms.[896] Such measures will ensure that even the most vulnerable have access to the relevant information and sufficient public participation opportunities so that they can meaningfully engage in decision-making that affects them and the urban spaces they occupy, as well as their own health and well-being.

As a result of the fact that the vulnerable and marginalised groups are disproportionately impacted by the effects of climate change, it is crucial that they be integrated into civil society and community groups and institutions as envisioned here.[897] This entails having the required access to platforms for participation, information, and decision-making forums to express their needs and concerns, ensuring that all community segments are actively involved and contribute to the community's long-term socio-economic and environmental sustainability, as well as being included in immediate action initiatives that promote the community's resilience.[898]

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893 See para 2.3.2.2 above.
894 See para 2.3.2.1 above.
895 See paras 2.3.2.1 and 2.3.3.1 above.
896 See paras 2.3.2.3 and 2.3.2.4 above.
897 See para 2.3.2.3 above.
898 See para 2.3.2.3 above.

For communities to take part in these participation processes, there is a need for awareness, knowledge or education regarding the topic up for discussion, and access to information regarding the issues that communities face to enable them to make informed decisions and contributions and meaningfully participate in matters that may affect them.[899] This might be in the form of scheduled meetings with adequate prior notice, councillors of the municipality, and ward committees and advisory committees that provide formal and direct communication to all residents and relevant parties.[900] Municipalities must establish mechanisms, processes and procedures to enable public participation, and there should ideally be a "gateway" through which communities can voice complaints and suggestions on matters and decisions that affect them, and one through which they receive updates and information.[901] This can be achieved through communication methods and technologies that establish a direct connection between the community and the municipality, where they can voice complaints, report on infrastructure or service delivery issues, and receive updates on service delays and other information.[902] Due to the vulnerabilities mentioned above, it is necessary also that municipalities be considerate of the community's literacy, and be inclusive of persons with disabilities, women and other disadvantaged groups.[903]

2.5.4 Nature-based urban planning

As suggested in the previous section of this chapter,[904] there are several NBS or infrastructure elements available for consideration in South Africa's urban spaces that can help enhance urban climate resilience and how cities are impacted by climate change. The maintenance of nature-based infrastructure (also referred to as urban green infrastructure) are arguably more cost effective in the longer term,

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899 Williams 2006 *Policy Studies* 204-206.
900 Section 17(1)(d) and (4) of the MSA.
901 Section 17(2) of the MSA.
902 This could take the form of customer care centres, electronic or digital means of communication such as Cape Town's C3 notification system and their Development Facilitation Service Centre, eThekwini's Business Dialogue Forums, City Business Chamber and KZN One Stop Shop, all of which enables easy communication with the municipality for different things and improves engagement with municipalities. See SACN *Urban Governance Paper Series* 90-93.
903 Section 17(3) of the MSA.
904 See para 2.3.3.1 above.

and provide a mechanism to enhance resilience in cities to climate change through establishing more carbon sinks and areas of microclimate regulation, water retention benefits (which will greatly benefit water insecure areas) and lower energy consumption for heating or cooling of buildings.[905]

South Africa has significant renewable energy potential, and investments in renewable energy projects can create jobs in the installation, maintenance, and operation of clean energy infrastructure. Transitioning to a green economy can generate employment opportunities while reducing the environmental impacts of a coal-based and CO_2-intensive energy model. The transition to a low-carbon economy with lower levels of air pollution, which is considered the greatest environmental health threat, is one that requires a holistic and integrated approach with well-designed NBS in order to enhance the state of the natural environment, urban resilience, and the benefits human beings enjoy from ecosystem services.[906]

An important aspect to note, as argued by Wernecke and Pool,[907] is that urban greening and the use of NBS alone do not constitute compensation for the systemic inequalities and disproportionate burdens related to environmental health risks like air pollution, and that reducing such burden requires a combination of technical and socio-economic interventions, beyond mere nature-based responses. However, in developing countries such as South Africa, where structural poverty, unemployment and lack of basic public service delivery issues are prevalent, the natural environment and potential benefits to be gained through ecosystem services are not considered a necessity but rather a luxury.[908]

Enhancing urban climate resilience necessitates action to rehabilitate and maintain biodiversity areas that are under threat in order to restore them to a good ecological condition, to enable such areas to support natural adaptation and mitigation

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905 Wernecke and Pool 2022 *Clean Air Journal* 2; WWF SA *Making the Case for Investing in Nature-based Solutions* 10; Thorn *et al* 2021 *Landscape and Urban Planning* 2.

906 Wernecke and Pool 2022 *Clean Air Journal* 2.

907 Wernecke and Pool 2022 *Clean Air Journal* 2.

908 Cilliers, Cilliers and Lategan "Nature-Based Solutions for Public Green Spaces in Sub-Saharan Africa—Integrating Place-Making and Green Infrastructure" 92.

processes and to deliver ecosystem services.[909] This is also essential for preserving the adaptive capacity of natural systems to climate change and enhancing resilience for both humans and the built environment.[910]

There is an increasing need for sustainable water resource use for both surface and underground water sources, the reuse of wastewater, and desalination to address challenges of water supply and demand.[911]

2.5.5 Suitable built environment

In light of the increasing uncertainty that climate change brings and the continuously changing circumstances that need to be considered in urban spaces, there is a need for mainstreaming of climate resilience into planning processes in such a way that they are flexible, context-based and anticipate possible failures, and making the planning "safe-to-fail" through integrating climate adaptation planning into current planning objectives.[912] Further, as underscored by each of the other features above, suitable and adequate infrastructure is an undeniable part of urban climate resilience, as without it, many systems will fail. As such, this feature requires context-specific and appropriate land use planning cognisant of local vulnerabilities and risk.[913]

This entails the incorporation of infrastructure and technologies such as early warning systems and other digital technologies, data analytics and communication networks for informed and evidence-based decision-making and planning in cities.[914] It also calls for an integrated systems-based approach in terms of infrastructure, to incorporate blue-green infrastructure into grey infrastructure, through nature-based solutions and ecosystem services into urban spaces, for example.[915] This could include greening and retrofitting in existing built environments and water-sensitive

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909 SANBI *National Biodiversity Assessment 2018* 10.
910 SANBI *National Biodiversity Assessment 2018* 10-11.
911 Department of Water and Sanitation *National State of Water Report 2021* 1.
912 Cilliers *et al* 2022 *Frontiers in Sustainable Cities* 2.
913 See para 2.3.3.2.1 above.
914 See para 2.3.3.2.4 above.
915 See paras 2.3.3.1 and 2.5.4 above.

urban design. Additionally, this feature requires diverse transport networks that provide reliable alternatives in cases of failure in transport infrastructure, or infrastructure failures under one of the other features, such as basic service delivery. This also means that transport networks must be accessible, affordable, safe, inclusive and connected, and must allow for evacuation and emergency access.[916] Another measure that can be implemented for resilience under this feature is mixed-use zoning that incorporates transit-oriented development and pedestrian and cyclist-friendly neighbourhoods and networks, and low-carbon transport alternatives that move away from individual ownership to public modes of transport.[917]

2.5.6 Coordinated and cooperative government

This feature relates broadly to ensuring sufficient law enforcement, combating corruption and maladministration to establish public trust in government entities, and to establishing integrated developmental planning.[918] As such, it consists of good governance practices that are transparent, foster accountability, responsibility, and responsiveness, and engage with the needs of communities.[919] This in turn results in government having sound policies and legislation, political stability, effective local government that provides adequate services, and has effective leadership and management with the necessary skills, knowledge and financial capacity. It also promotes coordinated efforts and collaboration across different departments, agencies and sectors for mainstreaming urban climate resilience into existing law and policy and urban development, and creating opportunities for meaningful public and stakeholder engagement.[920] Furthermore, it includes corruption prevention and control mechanisms, integrated developmental planning that considers climate change aspects and local vulnerability, is proactive, utilises ICT infrastructure to effectively plan and prioritise interventions and responses accordingly, implements monitoring and evaluation mechanisms to track progress

916 See para 2.3.3.2.4 above.
917 See para 2.3.3.2.4 above.
918 See para 2.3.4 above.
919 See para 2.3.4.1 above.
920 See para 2.3.4.2 above.

of initiatives, and contains long-, medium- and short-term strategies.[921] Another consideration in the South African context is how coalition governments affect the coordinated and cooperative governance idea, which, although present in the previous presidential term, is now a national scenario facing cities, and oftentimes these coalition governments experience a lot of turmoil depending on which political parties and agendas are combined. In Tshwane, for example, the coalition governments are fraught with disruption.[922]

2.6 Concluding remarks

This chapter crafted a definition of and conceptualised climate resilience with specific reference to the South African urban context.[923] Hence, it identified and characterised the features of urban climate resilience by analysing and deconstructing the scholarly discourse in the areas of environmental, climate change, urban and resilience fields. After setting out the conceptualisation of urban climate resilience, the chapter distilled a workable typology consisting of a contextual understanding of urban climate resilience categorically grouped into different spheres of the embedded spheres model, as suggested in Figure 2-6 to be used throughout the remainder of the study.[924] The typology provides insight into the general urban climate resilience features found in the academic discourse and was applied in the South African urban context to ascertain the *status quo* of the country in terms of these features, with the aim of identifying actionable features to be applied in the promotion of urban climate resilience.[925]

The conceptualisation of urban climate resilience in this chapter illuminates the complex nature of the concept, revealing its multifaceted interpretations derived from disciplines as varied as ecology, engineering, and disaster risk management.[926]

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921 See para 2.3.4.3 above.

922 See Booysen 2024 https://theconversation.com/south-africas-unity-government-is-being-tested-the-toppling-of-a-mayor-in-a-key-city-exposes-faultlines-239986; Brooks 2022 https://theconversation.com/a-stable-national-coalition-government-in-south-africa-possible-but-only-if-elites-put-countrys-interests-first-193828.

923 See paras 2.2.1 to 2.2.4 above.

924 See paras 2.2.4 and 2.3 above.

925 See paras 2.4 and 2.5 above.

926 See para 2.2 above.

Such interdisciplinary roots, while providing a comprehensive foundation, introduce a degree of conceptual complexity when attempting to delineate a precise definition, especially within the specific context of South Africa's urban landscape.[927] The country's distinct socio-economic and environmental challenges necessitate a nuanced understanding of resilience, climate resilience and urban climate resilience as such.[928] The vast and global discourse on the subject, while invaluable, must be contextualised to resonate with the unique characteristics and specificities of South African urban areas. The rigorous analysis undertaken underscores the variability of the term "urban climate resilience," emphasising its adaptability in response to the evolving urban dynamics of the region.

Urban resilience is not an isolated concept; it is intricately linked with various socio-economic and environmental factors. The chapter emphasises the need for an integrated approach, one that considers the socio-economic realities of urban populations, environmental challenges, and the unique vulnerabilities of specific urban areas.[929] The chapter's focus on the South African urban context adds a layer of complexity to the discourse on urban resilience.[930] South African cities, with their unique challenges and opportunities, require tailored resilience strategies. The chapter's analysis suggests that generic resilience measures may not fully assist in addressing the specific challenges faced by South African cities. Further to this, the chapter also found that there is no one-size-fits-all approach and that urban climate resilience does not constitute a generalisable set of features that can be "copied and pasted" or explicated to all city circumstances and geographical urban areas, as each can have diverse challenges and unique circumstances. This inherent adaptability, while advantageous in allowing for context-specific interpretations, also poses challenges. Although the features identified are valid in the general context, there are "missing" features that stem from the context of South Africa as a developing country facing severe challenges related to poverty, safety and security, violence and community unrest, equality and justice issues, as well as the capacity

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927 See para 2.2 above.
928 See para 2.4 above.
929 See para 2.3 above.
930 See para 2.4 above.

required to address not only the identified general features for urban climate resilience, but also the additional challenges faced.

The actionable features identified specifically for the South African context entail a) LED and sustainable livelihoods; b) adequate basic services; c) inclusive community structures and participation processes; d) nature-based urban planning; e) suitable built environment; and f) coordinated and cooperative governance.

Policymakers and urban planners need to ensure that resilience strategies are aligned with these features, ensuring their effectiveness and relevance. For legal scholars, policymakers, and urban planners, this presents a challenge of retaining the flexibility of the concept while ensuring a consistent, shared understanding that can guide cohesive resilience-building efforts. In this vein, it is important, therefore, that mitigation, adaptation and resilience agendas and responses are customised to fit local contextual needs.[931] Although not the main focus of the chapter, this chapter hints at the legal and policy frameworks governing urban resilience in South Africa and shows a complex interplay of statutes, regulations, and guidelines to be explored in more depth in Chapter three. These instruments, while comprehensive in their scope, reveal an underlying tension between ambitious goals and practical implementation, particularly within the confines of secondary cities. South Africa's commitment to fostering urban resilience is evident from an inclusive reading of the country's legal and policy instruments.

[931] See para 2.4 above.

CHAPTER 3 THE ROLE OF LAW AND THE LEGISLATIVE AUTHORITY OF LOCAL GOVERNMENT FOR URBAN CLIMATE RESILIENCE IN SOUTH AFRICA

3.1 Introduction

The law can be described as the cornerstone of society as it aims to facilitate, organise and regulate the relationships, interactions and actions or behaviours of the constituents therein, through establishing a set of binding rules, principles and values in a community.[932] It creates certain rights and duties which need to be upheld, which denotes the regulatory role of law.[933] The transgression of these rights and duties has consequences in order to hold people accountable and responsible towards one another and the society at large.[934] These rules, principles, rights and duties are effectuated and realised by the state, which gains its authority through the premise of the social contract.[935] In terms of this social contract, society sacrifices some freedoms in exchange for authority from rulers, such as a government, to enforce the rules, realise the rights of the community and perform the duties expected of them and assigned to them through such law.[936]

Beyond the obvious regulatory role, the law also plays an institutional and guiding role. In terms of the institutional role (and as part of the "institutions" as set out in the preceding chapter),[937] the law plays an integral role in the composition of government structures and processes to ensure that governance occurs in a manner that promotes efficiency, transparency and accountability, in line with the goals of

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932 Kleyn *et al Beginner's Guide for Law Students* 1; Du Bois *Wille's Principles of South African Law* 3-4; Humby *et al* "Inleiding" 5; Mehling "Implementing Climate Governance: Instrument Choice and Interaction" 11.

933 Du Bois *Wille's Principles of South African Law* 3-4.

934 Paterson and Kotzé "Introduction" 2-3; Craigie, Snijman and Fourie "Dissecting Environmental Compliance and Enforcement" 41-42.

935 Humby *et al* "Inleiding" 3.

936 See Sasan 2021 *Shanlax International Journal of Arts, Science and Humanities* 36; Rousseau *The Social Contract* 7; Hobbes 1651 https://www.gutenberg.org/files/3207/3207-h/3207-h.htm#link2H_4_0250; Locke *Two Treatises on Civil Government* 236.

937 See para 2.3 and Figure 2-7 above. See also Tyler and Moench 2012 *Climate and Development* 313-314.

good governance.[938] In other words, it prescribes the way in which the "agents"[939] go about their duties and responsibilities.[940] The law has for ages been used as a method of civilising constituents and guiding them to behave in a way that is deemed acceptable by the society of the time. It establishes latent moral sensibility and values, which arguably indicates the guiding role of the law.[941] The guiding role can also be argued to comprise the non-binding soft law policy instruments that are inherent in legal and policy frameworks, plans and programmes that are not necessarily legally binding but guide the planning, development and other visions of government. With the broad range of characteristics and the indispensable role of law, it can be deemed a functional necessity in a society and serve as a mechanism for practical problem-solving.

Furthermore, law is considered to be multi-disciplinary, as in many instances it is required to bridge the divide between several other fields, such as the natural sciences and engineering, among others, and incorporate principles and knowledge of these fields into law and policy.[942] In other words, the law has the potential to regulate the different sectors and areas to enable or mandate activities that contribute to urban climate resilience.[943] The law ultimately plays a fundamental role in shaping and managing the urban environment and governing the complex intricacies of urban spaces.[944] The law influences urban planning, land use planning, property and ownership rights, the environment, infrastructure development, and resource management, among other aspects,[945] through legal frameworks, policies,

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938 See paras 2.5.6 above as well as 4.4 below. See also Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-23.

939 See Figure 2-7 above.

940 See Tyler and Moench 2012 *Climate and Development* 313-314.

941 Selznick *Law, Society and Industrial Justice* 4-7; Humby *et al* "Inleiding" 5. See also para 4.5 below.

942 Du Plessis 2015 *South African Journal of Science* 1.

943 McDonald and McCormack 2021 *WIREs Clim Change* 2.

944 See Humby *et al* "Inleiding" 4.

945 These areas of law are collectively colloquially also known as urban law. UN-Habitat defines urban law as "the collection of policies, laws, decisions and practices that govern the management and development of the urban environment." See also Van der Berg and Verschuuren *Urban Climate Resilience: The Role of Law* 7; Mousmouti and Crispi "Good Legislation as Means of Ensuring Voice, Accountability, and the Delivery of Results in Urban Development" 257; Glasser and Berrisford "Urban Law: A Key to Accountable Urban Government and Effective Urban Service Delivery" 212.

regulations, and by-laws. In the context of urban climate resilience, the role of law extends to regulating and facilitating adaptive and mitigatory measures and responses that enhance a city's capacity to withstand and recover from climate-related shocks and stresses.[946] Moreover, it can also define these aspects, prescribe duties and responsibilities for government departments and officials, including for local government.

As briefly mentioned above,[947] urban climate resilience can be strengthened through direct action, which includes a sound law and policy framework. This chapter sets out to determine how law may contribute to urban climate resilience, with specific reference to the South African urban context. Furthermore, this chapter aims to critically analyse the relevant law-making responsibility and authority of local government in South Africa. The objectives of this chapter pre-empt the main objective of the study by providing context on law as a mechanism for promoting urban climate resilience and explaining the role of the law as well as the responsibility and authority of local government legislation in this regard. The chapter does this by first considering which of the features distilled from Chapter two above are susceptible to regulation by law,[948] and *legislative* regulation,[949] in particular. This is done as not all the features identified above may be susceptible to government regulation or intervention through the law. From the identified features, those that are deemed to fall within the legislative authority of local government in South Africa are then identified.

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946 McDonald and McCormack 2021 *WIREs Clim Change* 2.

947 See para 1.2.2 above.

948 Legal regulation or regulation by law here denotes the broader legal mechanisms that can impact regulation and include measures such as litigation, policy, soft-law instruments, and (local environmental) governance instruments. "From a regulatory governance perspective, legislation can be a subset of regulation. Therefore, regulation can be made via many means, one of which is legislation." – Kosti, Levi-Faur and Mor 2019 *The Theory and Practice of Legislation* 171.

949 Legislative regulation, whilst part of the broader legal regulation, in this context focuses on regulation through legislation specifically. This means that it pertains to legislation made by the legislature and enacted as an Act of Parliament (primary legislation), or, in the case of by-laws, law made by bureaucracies, i.e., the administrative and executive of municipalities, for example (secondary legislation or by-laws). "Regulation can be a subset of legislation. This means that legislation has many functions, one of which is regulation." – Kosti, Levi-Faur and Mor 2019 *The Theory and Practice of Legislation* 172.

3.2 Law as a mechanism for promoting urban climate resilience

3.2.1 The role of law

To consider law as a mechanism and determine the role of the law in enhancing urban climate resilience, while deliberating which of the actionable features for urban climate resilience are susceptible to legal regulation, it is indispensable to understand what public sector regulation and government regulation entails, though it is not the focus of this chapter. Firstly, the public sector is the part of the economy that is controlled and managed by government.[950] It is made up of all levels of government, public goods and services, public enterprises, and government-owned and -operated enterprises.[951] These entities are meant to serve public interest through taking the interests and well-being of the public into account in decision-making, administration and management.[952] Secondly, government regulation pertains to the goods and services delivered by government itself, either at a national, provincial or local level. It includes the activities of the executive and the administration pertaining to law- and policymaking and implementation.

The law is derived from several sources of law, namely the constitution of a country, legislation, judicial precedent, common law, custom, customary law, foreign law, and international law, along with the work of modern scholars.[953] This indicates that the legal system of a country can either be codified (systematically recorded) or uncodified (not systematically recorded and dependent on a range of different written or unwritten sources of law).[954] There is also a responsibility on government to develop laws and policies to give effect to their mandates in line with the Constitution, to "promote sustainability, and to, by implication, address climate

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950 Mirriam Webster Dictionary 2023 https://www.merriam-webster.com/dictionary/public%20sector; Cambridge Dictionary 2023 https://dictionary.cambridge.org/dictionary/english/public-sector.

951 Institute of Internal Auditors (IIA) *Supplemental Guidance: Public Sector Definition* 3.

952 Lane *The Public Sector: Concepts, Models and Approaches* 12.

953 Kleyn *et al Beginner's Guide for Law Students* 55.

954 Du Plessis, Raboshakga and Kotzé "Sources of Law and Legal Authority" 203.

change,"[955] and to ensure that these laws and policies are implemented. This also supposes that law and policy instruments can be legally binding and enforceable.

Legislation, as one source of law, is considered rigid and inflexible for purposes of stability and predictability associated with the rule of law.[956] However, as mentioned in Chapter two,[957] Ebbesson, in framing the four factors for resilience in the governance of socio-ecological systems, argues that while the law and rule of law is meant to represent predictability and legal certainty, it can, at a smaller scale, be flexible and open in the sense that there may be a certain amount of discretion allowed for decision-making where it can prevent harm to human health and well-being or where it threatens the environment, subject to public participation and inclusion. This argument is supported by McDonald and McCormack,[958] who synthesised five critical design principles for adaptation law, of which the first pertains to adaptability of law to "broader social, environmental, and climatic conditions and changes" and recommends using mechanisms such as sunset clauses and regular legislative review processes, along with adaptive management approaches, to ensure the continued effectiveness of the law.[959] Further to this, it is argued that, in legal implementation, there is often room for interpretation when statutes or precedents are considered, there are several arguments to be made whether through "statutes, preparatory works, established legal principles, guidelines, international agreements, court cases, or literature", which are then debated and weighed against each other.[960] This is usually where the judiciary plays an important role, especially in determining the purpose of the law. One should, however, bear in mind that the law is constantly evolving through legislative

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955 Van der Berg and Verschuuren *Urban Climate Resilience: The Role of Law* 7.

956 See para 1.3 above. See also Green *et al* 2015 *Front Ecol Environ* 333; Ebbesson 2010 *Global Environmental Change* 415-416; Garmestani, Allen and Benson 2013 *Ecology and Society* 1.

957 See para 2.3.4 above.

958 McDonald and McCormack 2021 *WIREs Clim Change* 15.

959 The other principles include that adaptation laws must be cognisant of the equity dimensions of climate change, that new laws shift from business-as-usual to enabling innovative approaches that do not achieve a certain outcome by undermining and threatening other values, that such laws should maximise co-benefits and limit risks, and lastly, that provides transparent and unambiguous processes for prioritising actions and managing trade-offs. See McDonald and McCormack 2021 *WIREs Clim Change* 15-16.

960 Ebbesson 2010 *Global Environmental Change* 415.

amendments or law reform, new precedents, creation of new by-laws, and so forth. With regard to adaptive law as envisioned in the academic discourse, this chapter mainly focuses on the *lex lata* (the law as it is) and not the *lex referenda* (the law as it ought to be). Acknowledging the growing discourse on adaptive law[961] and the move toward it in the resilience discussion, it is for the purpose of this study not included as an identified feature of urban climate resilience in the South African context, though it could qualify as one. This is because governments must work with the law as it is, even if the law or the nature thereof has shortcomings. Also, this chapter of the study sets out to determine what the role of the law and legislation is and to what extent the current legal framework makes provision for urban climate resilience through existing and new legislation or by-laws, policies, precedents, etc., as opposed to full-scale adaptive law envisioned above.

There are also governance instruments available under the legal and policy framework that may be used to enhance urban climate resilience. These instruments could include, for example, local environmental governance (LEG) instruments,[962] strategic and spatial planning instruments,[963] fiscal instruments, environmental management instruments, disaster management and climate adaptation planning instruments.

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961 See McDonald 2011 *WIRES Climate Change* 284; Camacho 2023 *Law, Innovation and Technology* 302-304, 307-311; Cosens *et al* 2017 *Ecology and Society* 1, 10; Frohlich *et al* 2018 *Ecology and Society* 6-10; Arnold and Gunderson 2013 *Environmental Law Reporter* 428-442; Ruhl 2012 *Ecology and Society* 3-5; Baker 2015 *Chicago-Kent Law Review* 572-573; Angelo 2008 *Nebraska Law Review* 951; Ruhl 2011 *North Carolina Law Review* 1379, 1389-1393; Flatt 2012 *Florida Law Review* 275-277; DeCaro *et al* 2017 *Ecology and Society* 2-3; Van der Berg and Verschuuren "Introduction to Climate Resilient Cities and the Law" 5.

962 Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-33.

963 Van der Berg and Verschuuren *Urban Climate Resilience: The Role of Law* 8.

Among the LEG instruments, for example, are compliance-based,[964] governance-based,[965] governing-based,[966] as well as cross-cutting instruments.[967] Some of these are required by law, while others are merely considered voluntary. For purposes of this study and based on the discussion below,[968] only governing-based instruments will be discussed here. These governing-based instruments include traditional command-and-control instruments, incentives and disincentives, agreement-based, and civil-based instruments.

Command-and-control instruments are regulatory in nature, such as legislation or norms and standards with which compliance is mandatory, and include the enforcement thereof and consequences of non-compliance.[969] An apt example of such instruments, as relevant for this study, is by-laws at the local government level.[970] Incentives (such as tax rebates or exemptions) and disincentives (fees and tariffs, taxes and penalties) can be used to change behaviour based on the inclination towards financial self-interest and serve as a financial motivator or deterrent for specific actions.[971] Agreement-based instruments are typically legally binding agreements provided for in legislation, such as environmental management co-operation agreements, public-private partnerships (PPPs), and other collaboration agreements.[972] Lastly, civil-based instruments include structural, procedural, and other rights-based instruments.[973] Though the law provides for the latter three categories of governing-based instruments, and they may be included

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964 Compliance-based instruments are those instruments that municipalities are required to comply with as governed entities by line departments, national and provincial governments. See Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-13.

965 Governance-based instruments are used by municipalities to control and manage their internal processes and activities, and holding municipal council office bearers accountable. See Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-23.

966 Governing-based instruments are discussed in the text as applicable for the purpose of this study.

967 These instruments cannot easily be categorised under the abovementioned instrument types. See Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-61.

968 See paras 3.3 and 3.4 below.

969 Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-33 – 3-34.

970 See 3.4 below.

971 Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-42.

972 Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-45; Van der Berg *Legal Perspectives on the Function of Public-Private Partnerships in Local Disaster Management in South Africa* 39.

973 Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-46.

in legislation, they are not directly relevant to the discussion at hand as the focus is on command-and-control instruments.

As mentioned above, these governance instruments provided for in law can be construed as relevant for the realisation of climate resilience, as they are geared towards the promotion and achievement of urban climate resilience, even if they do not provide for it as such.[974] The law can be instrumental in the advancement of urban climate resilience through promoting adaptation by enabling certain activities while prohibiting others that threaten urban climate resilience. However, the law can also hinder urban climate resilience when certain rights (such as property rights, for example) undermine climate resilience efforts and cause vulnerabilities to disasters and hazards to continue to exist.[975] The latter is increasingly possible if legislation is not adequately geared towards achieving the aims and purposes for which it was made. Evidently, the law, as a whole, is encompassing enough to provide several mechanisms through which urban climate resilience can be achieved. For the purposes of this study, the focus will turn to the function of legislation (as one source of law) within the urban law domain.

3.2.2 Legislative framework in South Africa

In South Africa, the national legal framework, inclusive of the Constitution, determines, first of all, the architecture of governance in South Africa, providing for the three spheres of government and the executive, legislative, and judicial tiers of government.[976] Secondly, the direction climate governance is taking, but it also makes provision for the responsibility and authority of local authorities. There is a corpus of environmental, climate change, and spatial planning (relevant to cities and urban environments) laws and policies at the three levels of government - national, provincial, and local - that regulate the physical, environmental, and social aspects of urban areas, and that are "underpinned by principles of good governance, responsible financial planning, transparency, administrative justice and public

974 McDonald and McCormack 2021 *WIREs Clim Change* 2.
975 McDonald and McCormack 2021 *WIREs Clim Change* 2.
976 De Vos and Freedman *South African Constitutional Law in Context* 99-101.

participation".[977] Again, it is indispensable that any legislation be fit for purpose. Failing to be fit for purpose may result in ambiguous and unclear provisions "that are complex, overlapping, leave gaps in protection, that are difficult to access or understand and poorly enforced and implemented."[978] Hence there is a need, not only for legislation, but good legislation that is aimed at effective urban management and development while being cognisant of the people and local socio-economic realities, sustainable development, with consideration of environmental and socio-economic aspects, regulatory barriers, as well as implementation and enforcement.[979] This, in effect, also means that legislation should not be overambitious, unrealistic in light of local contexts and resources or capacities, outdated, and difficult to understand and comply with.[980]

South Africa has a rich body of environmental legislation in the form of the framework legislation - the NEMA and SEMAs.[981] As such, the law can also be described as multi-sectoral in that it caters for a range of different sectors needing attention in society. Relevant for the purposes of this study is the legislative basis found in national environmental, climate change, planning, and urban law. The existing national environmental management legislation provides for a collection of principles and covers an expanse of different sectors, including air quality,[982] biodiversity,[983] protected areas,[984] coastal management,[985] waste,[986] and water and sanitation services.[987] In addition to its environmental laws, the country also has a relatively young SPLUMA.

The reasoning behind the need for different sectors under the framework environmental legislation stems from the reality that different government

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977 Van der Berg and Verschuuren *Urban Climate Resilience: The Role of Law* 7.
978 Mousmouti and Crispi 2015 *World Bank Legal Review* 258-259.
979 Mousmouti and Crispi 2015 *World Bank Legal Review* 258-259.
980 Glasser and Berrisford "Urban Law: A Key to Accountable Urban Government and Effective Urban Service Delivery" 212; Mousmouti and Crispi 2015 *World Bank Legal Review* 260-262.
981 See para 1.3 above.
982 NEMAQA.
983 NEMBA.
984 NEMPAA.
985 NEMICMA.
986 NEMWA.
987 NWA; *Water Services Act*.

departments are responsible for different areas and, while this fragmentation is criticised, it has also made way for the development of sector-specific legislation and policy imperatives to address sector- and context-specific challenges.[988] Moreover, these sectors are, in many instances, so interlinked that one cannot divorce them from one another completely.[989] This is where cooperative governance becomes important. Notably, the South African legal framework requires such cooperation and expects different spheres of government, as well as different sector or line departments, to work together in realising their mandates and ensuring the realisation and implementation of the law.[990]

In the context of the broader climate change mitigation and adaptation actions, South Africa has up to this point relied heavily on sector-specific policies in the form of action plans,[991] climate strategies,[992] and existing laws to drive national climate action until the new sector-specific environmental legislation for climate change, the Climate Change Act,[993] was enacted.[994] The need for such specific legislation dealing with issues of climate change, vulnerability, environmental protection and regulation, and spatial regulation allows for, *inter alia*, administrative decision-making, the use of environmental management tools such as environmental impact assessments (EIAs) or strategic environmental assessment (SEA), as well as spatial planning tools, disaster management frameworks, and adaptation funding mechanisms.[995] These are all legal instruments that can be used for enhancing urban climate resilience.

The sources of law also provide the legislative means through which urban climate resilience, based on the actionable features identified, can be realised and enhanced

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988 Soyapi and Kotzé "Transnational Environmental Law: The Birth of a Contemporary Analytical Perspective" 75. See also McDonald and McCormack 2021 *WIREs Clim Change* 12.

989 Batra, Uitto and Condo-Noordhuizen 2015 *eVALUatiOn Matters* 19.

990 Section 41(1) of the Constitution. And the IGRFA.

991 DEA *The National Climate Change Response Monitoring and Evaluation System Framework* (2015); *National Climate Change Response Whitepaper* (2011).

992 DFFE *National Climate Change Adaptation Strategy* (2019).

993 *Climate Change Act* 22 of 2024.

994 See, for example, the *Carbon Tax Act* 15 of 2019; NEMAQA.

995 McDonald and McCormack 2021 *WIREs Clim Change* 12; Van der Berg and Verschuuren *Urban Climate Resilience: The Role of Law* 8.

in South African cities. This arguably also makes the case for where local government's duties in terms of urban climate resilience lie. Therefore, the law is also considered to be multi-layered in that it exists at an international, national, sub-national and local levels.

3.3 Features of urban climate resilience susceptible to legal regulation

Significantly, some features of urban climate resilience may be regulated as a whole, whilst others may be partially regulated, and others perhaps not at all. Based on the discussion in Chapter two and consideration of the current legislative framework and the applicable sectors regulated through law,[996] it is argued that the features that can be regulated by legislation include, **adequate basic services** as they fall within the mandates of local government and are provided for as one of the functions of local government over which it has legislative authority;[997] **inclusive community structures and processes** as these are required in the MSA and other sector legislation;[998] **nature-based urban planning**;[999] **suitable built environment**;[1000] and **coordinated and cooperative governance**.[1001] The remainder of this section examines the legal framework relevant to urban climate resilience in order to determine the extent to which the law contributes to and enables its enhancement. It thematically discusses the relevant legislative framework in accordance with the features of urban climate resilience as established in Chapter two of this thesis.[1002]

3.3.1 LED and sustainable livelihoods

The duty that falls on government to promote sustainable livelihoods for citizens is rooted in the Bill of Rights and must accordingly be respected, protected, promoted, and fulfilled by the state.[1003] The Constitution sets out several socio-economic rights

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996 See paras 2.4 above.
997 See para 2.4.1 above.
998 See para 2.4.2 above.
999 See para 2.4.3.1 above.
1000 See para 2.4.3.2 above.
1001 See para 2.4.4 above.
1002 See para 2.4 above.
1003 Section 7(2) of the Constitution.

that are important instruments in promoting inclusive and sustainable livelihoods. These substantive rights include the rights to equality,[1004] human dignity,[1005] life,[1006] freedom and security of the person,[1007] freedom of trade,[1008] environment,[1009] property,[1010] adequate housing,[1011] healthcare,[1012] food,[1013] water,[1014] and social security,[1015] education,[1016] language and culture.[1017] The promotion of sustainable livelihoods can arguably also be found in the value of "human dignity, achievement of equality, and advancement of human rights and freedoms" enshrined in the Constitution.[1018] The realisation of the rights to human dignity, life, an environment not harmful to one's health and well-being, and basic human rights related to food, water and adequate housing, in particular, are, therefore, definitively equated with and inherent to a sustainable livelihood and the so-called "right to the city".[1019]

The promotion of livelihood can also result in a more conducive business environment in which sustainable economic development can occur. As such, it is also pertinent that government ensures such basic services in places of trade, whether formal or informal, to ensure the sustained livelihoods, freedoms, and human dignity of those working to contribute to the local economy and ultimately

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1004 Section 9 of the Constitution.
1005 Section 10 of the Constitution.
1006 Section 11 of the Constitution.
1007 Section 12 of the Constitution.
1008 Section 22 of the Constitution.
1009 Section 24 of the Constitution.
1010 Section 25 of the Constitution.
1011 Section 26 of the Constitution.
1012 Section 27(1)(a) of the Constitution.
1013 Section 27(1)(b) of the Constitution.
1014 Section 27(1)(b) of the Constitution.
1015 Section 27(1)(c) of the Constitution.
1016 Section 29 of the Constitution.
1017 Sections 30 and 31 of the Constitution.
1018 Section 1(c) of the Constitution. The right to equality is also supported and supplemented by the *Promotion of Equality and Prevention of Unfair Discrimination Act* 4 of 2000.
1019 The notion "right to the city" is attributed to Henri Lefebvre. See Leary-Owhin and McCarthy (eds) *The Routledge Handbook of Henri Lefebvre, The City and Urban Society* 1-3; Bauer and Fischer (eds) *Perspectives on Henri Lefebvre* 1; King "Henri Lefebvre and the Right to the City" 76. See also Pieterse 2014 *South African Law Journal* 152-156; Coggin and Pieterse 2012 *Urban Forum* 262-263; Purcell 2002 *GeoJournal* 99-107; Rolnik 2014 *International Journal of Housing Policy* 293-298; Horber *The Right to a 'World Class City'?: Street Trading, Public Space and Urban Governance in the Cape Town City Centre* 21-22; Parnell and Pieterse 2010 *International Journal of Urban and Regional Research* 2.

the GDP of the city and country.[1020] Furthermore, trade, occupation or profession, which means businesses, whether formal and registered, or informal enterprises, may be regulated by law for the protection of the general public rather than any arbitrary reasons that may infringe upon the rights of traders.[1021] Further to this, sustainable development also forms part of the objects of local government as part of municipal service provision to communities, along with the promotion of social and economic development.[1022] This means that local government must facilitate inclusive and equitable economic development through participatory approaches such as partnerships with civil society, economic empowerment of women and other vulnerable groups, as well as those operating in the informal sector, to ensure that a range of stakeholders from different sectors of the economy are involved in economic development.[1023]

3.3.2 Adequate basic services

Closely related to the feature of sustainable livelihood and employment opportunities and the so-called "right to the city" mentioned above[1024] is the provision of adequate and sustainable basic services. It is perhaps also the most critical feature in the context of South Africa. Basic services comprise the rights to adequate housing,[1025] environment,[1026] and water,[1027] as found in the Bill of Rights, and inherently also include services such as sanitation, energy, transport and telecommunication services that are arguably part and parcel of the right to the

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[1020] See Ngcobo *The Informal Economy for Local Economic Development in South Africa: A Constitutional Law Approach* 73-80. See also *South African Informal Traders Forum v City of Johannesburg; South African National Traders Retail Association v City of Johannesburg* 2014 ZACC 8 (the SAITF-case) para 31.

[1021] See, for example, Schedule 1 of the *Businesses Act* 71 of 1991. See also Ngcobo *The Informal Economy for Local Economic Development in South Africa: A Constitutional Law Approach* 74; *S v Lawrence, S v Negal, S v Solberg* 1997 10 BCLR 1348.

[1022] See ss 152 and 153 of the Constitution. See also Coggin and Pieterse 2012 *Urban Forum* 263.

[1023] Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 85-86.

[1024] See para 3.3.1 above.

[1025] Section 26 of the Constitution.

[1026] Section 24 of the Constitution.

[1027] Section 27(1)(b) of the Constitution; S 156(1)(a) read with Schedule 4B of the Constitution. See also ss 3 and 11 of the *Water Services Act* 108 of 1997; *Mazibuko v City of Johannesburg* 2010 3 BCLR 239 (CC).

city.[1028] These services are often part of the fundamental duties and functions of local government, as the sphere of government situated closest to the communities within their geographical boundaries. Furthermore, these services are regulated through specified sectoral legislation setting out the mandate and manner in which these services ought to be delivered. Regardless of the mandate falling with local government, all spheres of government may be held accountable for service delivery, if, and when, local government is unable to provide these services, provided that they do not compromise or impede the right of a municipality to exercise its powers and perform its functions.[1029] This can arguably be done by monitoring, support, or intervention by the provincial or national government.[1030]

The right of access to adequate housing is a very sensitive and contentious subject in the South African city context, given the historical injustices caused by apartheid and the increase of informal settlements and land grabs countrywide. Informal settlements prove to be a particularly difficult challenge for cities, especially in terms of service delivery and environmental mandates of government. The right to adequate housing is one that has been dealt with in several cases.[1031] The justiciability of socio-economic rights, particularly the right to access to adequate

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[1028] See Coggin and Pieterse 2012 *Urban Forum* 263.

[1029] Section 139 of the Constitution. See also *Coetzee v The Premier, Mpumalanga Province* (unreported) case number 2799/2017; *Unemployed Peoples' Movement v Premier, Province of the Eastern Cape* 2020 3 SA 562 (ECG); Fuo 2017 *De Jure* 326-327; Dube and Moyo 2022 *PELJ* 8.

[1030] The Municipal Support and Intervention Framework, published by SALGA, holds that "a provincial government should firstly fulfil its mandate to monitor local government. When a municipality has been identified as underperforming, the relevant provincial government must provide the necessary support to such a municipality. Only when support has failed can the provincial executive and/or national government invoke section 139. The Framework further guides how a municipality that has been subjected to a section 139 intervention can be supported to enable it to fulfil its executive and legislative mandate". SALGA *Municipal Support and Intervention Framework* 6-7. See also s 155(7) of the Constitution; *City of Johannesburg v Gauteng Development Tribunal* 2010 9 BCLR 859 (CC) paras 58-59; *City of Johannesburg Metropolitan Municipality v Blue Moonlight Properties* 2012 2 SA 104 (CC) paras 59 and 68.

[1031] There are many other instances in which courts grappled with the right to access to housing and property. The caselaw discussed here is not meant to be an exhaustive list or complete discussion but merely to highlight the justiciability of these rights along with other socio-economic rights. See cases such as *Government of the Republic of South Africa v Grootboom* 2000 11 BCLR 1169 (CC) para 37 (the Grootboom case); *Beja v Premier of the Western Cape* 2011 10 BCLR 1077 (WCC) para 115; *Residents of Joe Slovo Community, Western Cape v Thubelisha Homes* 2010 3 SA 454 (CC) para 10; *Daniels v Scribante* 2017 4 SA 341 (CC) paras 209-210.

housing, for example, was affirmed in *Government of the Republic of South Africa v Grootboom*[1032] (the Grootboom case). The case addressed the issues of eviction and homelessness, which infringed upon the respondents' rights under section 26 of the Constitution. The Constitutional Court held that the state bears an obligation to "take reasonable legislative and other measures", "to achieve the progressive realisation" of the right, "within available resources".[1033] In addition, the court determined that housing comprises "more than bricks and mortar" and means available land, adequate basic services such as the provision of water and sanitation services, and "the financing of all of these, including the building of the house itself."[1034] In essence, access to adequate housing, therefore, means that all of these conditions must be met.

The struggle of property rights and access to affordable housing, is an ongoing one that has resulted in legal and extra-legal claims of ownership that require resolution through the complex legal and policy frameworks, which in South Africa includes the *Prevention of Illegal Eviction from Unlawful Occupation of Land Act* 19 of 1998 (PIE Act), which has often been under consideration in court.[1035] In *Port Elizabeth Municipality v Various Occupiers,* the Port Elizabeth Municipality attempted to evict 68 unlawful occupiers under the PIE Act, despite their willingness to vacate if provided with alternative land. The Constitutional Court ultimately held that eviction must be "just and equitable" under the Constitution and the PIE Act, and consider factors such as the circumstances of occupation, length of unlawful occupation, availability of suitable accommodation or land, and absence of meaningful engagement.[1036] It found that the Municipality failed to meet these standards and dismissed the appeal, ordering it to pay the respondents' costs.

1032 *Government of the Republic of South Africa v Grootboom* 2000 11 BCLR 1169 (CC) para 37.
1033 See the Grootboom case para 38; s 26(2) of the Constitution.
1034 See the Grootboom case para 35.
1035 See *Prevention of Illegal Eviction from Unlawful Occupation of Land Act* 19 of 1998; *Port Elizabeth Municipality v Various Occupiers* 2005 1 SA 217 (CC); *Residents of Joe Slovo Community, Western Cape v Thubelisha Homes* 2010 3 SA 454 (CC) (10 June 2009).
1036 *Port Elizabeth Municipality v Various Occupiers* 2005 1 SA 217 (CC) paras 26-33.

The court, in *Charnell Commando v City of Cape Town*,[1037] highlighted some of the key considerations that have developed in jurisprudence over the years to provide a nuanced understanding of the right of access to adequate housing under section 26 of the Constitution. The court noted that this right requires the state to adopt and implement a comprehensive, workable, flexible, and continuously reviewed housing programme that responds to both immediate needs and long-term goals, within the limits of available resources.[1038] The court emphasised that housing interventions must be reasonable in both their design and execution, progressively expanding access across economic and geographic contexts.[1039] While the Constitution does not guarantee housing at the state's expense or a location of one's choice,[1040] spatial considerations, including proximity to employment, education, and social networks,[1041] as well as availability of land at or near that locality,[1042] available resources, and assistance for those in desperate need,[1043] play a crucial role in evaluating the adequacy and reasonableness of housing solutions, particularly in eviction and emergency accommodation cases.[1044] Importantly, the right to adequate housing is deeply interconnected with other constitutional rights such as

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1037 *Charnell Commando v City of Cape Town* 2024 ZACC 27 para 71.

1038 See *Grootboom* paras 39-46.

1039 See *Grootboom* paras 45-46.

1040 See *City of Johannesburg v Rand Properties (Pty) Ltd* 2007 6 SA 417 (SCA) para 44; *Residents of Joe Slovo Community, Western Cape v Thubelisha Homes* 2010 3 SA 454 (CC) para 254.

1041 The court, in *Thubakgale v Ekurhuleni Metropolitan Municipality* 2022 8 BCLR 985 (CC) paras 110-11, held, for example, "the permanent accommodation to be provided by the Municipality must…include ensuring continued access to schools, jobs, social networks and other resources which the applicants in this case enjoy where they currently stay, and which they will lose if displaced. This interpretation is in line with spatial justice and the right to the city, and therefore also in line with the remedial and transformative purposes of socio-economic rights and the Constitution more broadly". See also *City of Johannesburg v Rand Properties (Pty) Ltd* 2007 6 SA 417 (SCA) para 44; *City of Johannesburg Metropolitan Municipality v Blue Moonlight Properties 39 (Pty) Ltd* 2012 2 BCLR 150 (CC) para 88.

1042 See *Grobler v Phillips* 2024 1 BCLR 115 (CC) para 36.

1043 See *Grootboom* paras 48-65.

1044 *City of Johannesburg v Rand Properties (Pty) Ltd* 2007 6 SA 417 (SCA) para 44; *City of Johannesburg Metropolitan Municipality v Blue Moonlight Properties 39 (Pty) Ltd* 2012 2 BCLR 150 (CC) para 88.

dignity,[1045] education, and occupational freedom, reinforcing its role within a broader framework of transformative constitutionalism and spatial justice.[1046]

Furthermore, despite housing and urban and rural development being functional areas of concurrent national and provincial legislative competence,[1047] the *Social Housing Act* 16 of 2008 places a particularly heavy mandate on municipalities in stating that they must, where there is a demand for social housing within its municipal area, as part of its process of integrated developmental planning, take reasonable and necessary steps, within the national and provincial legislative, regulatory and policy framework to:

(a) facilitate social housing delivery in its area of jurisdiction;
(b) encourage the development of new social housing stock and the upgrading of existing stock or the conversion of existing non-residential stock;
(c) provide access -
    (i) to land and buildings for social housing development in designated restructuring zones;
    (ii) for social housing institutions to acquire municipal rental stock;
    (iii) to municipal infrastructure and services for approved projects in designated restructuring zones; and
(d) the extent permitted under the *Local Government: Municipal Finance Management Act*, 2003 (Act No. 56 of 2003), and the *Local Government: Municipal Systems Act*, 2000 (Act No. 32 of 2000), to -
    (i) initiate and motivate the identification of restructuring zones; and
    (ii) enter into performance agreements with social housing institutions.[1048]

Municipalities also bear responsibility for administering building regulations, municipal planning, and water and sanitation services in respect of domestic wastewater and sewage disposal systems, which are undoubtedly connected to housing and urban development.[1049]

Furthermore, national government is starting to acknowledge the importance of climate resilience in human settlements and the effects of not only climate change

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[1045] See *Dladla v City of Johannesburg* 2018 2 BCLR 119 (CC) para 47, in which the court held that the right to dignity obliged local authorities to respect family units when supplying temporary emergency accommodation to homeless persons.
[1046] See *Thubakgale v Ekurhuleni Metropolitan Municipality* 2022 8 BCLR 985 (CC) paras 110-11; *Grootboom* para 24. See also the long title and ss 7(a)-(e) of SPLUMA.
[1047] See Schedule 4A of the Constitution.
[1048] Section 5 of the *Social Housing Act* 16 of 2008.
[1049] See s 156 together with Schedules 4B and 5B of the Constitution.

and urbanisation, but also the effects of "unmanaged or poorly managed expansion of both urban and rural settlements."[1050] In the *Draft White Paper for Human Settlements* (2023) the Department of Human Settlements recognises the critical need to intervene in provision of human settlements "premised on the goal of establishing *resilient* human settlements"[1051] and moving towards such goals in the legislative and policy framework. It also highlights government's commitment to

> integrate *climate-resilient and sustainable development approaches* in human settlements… *into the planning,* design, construction, and operation of human settlements in an effort to avoid the devastating impacts of climate change.[1052]

To achieve this, the draft white paper also mentions the development of a *Human Settlements Climate Change Response Strategy* and implementation plan with mitigation and adaptation measures, to enable the transition to a low-carbon and climate-resilient society.[1053]

The right of access to sufficient water is inextricably linked to sanitation services. These services are encapsulated in the NWA, the *Water Services Act*, the NEMWA and the MSA. The legal framework related to water encompasses duties, rights and responsibilities for water usage, development, management, regulation, and conservation.[1054] The legislation thus makes provision for policies such as the *National Water Resources Strategy* (NWRS),[1055] the *National Water and Sanitation Master Plan*,[1056] the *National Water Security Framework*,[1057] and the National Sanitation Policy (2016).[1058] To give effect to water provision, the *Water Services Act* prescribes water services institutions that include, for example, water boards, water service authorities (WSAs), water service providers (WSPs) and a water

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1050 Para 4.5 of GN 4206 in GG 49895 of 18 December 2023 (the *Draft White Paper for Human Settlements* (2023)).
1051 *Draft White Paper for Human Settlements* (2023) 20, 32.
1052 *Draft White Paper for Human Settlements* (2023) 69.
1053 *Draft White Paper for Human Settlements* (2023) 69-70.
1054 See also Steenkamp *City-level Law and Governance of Water Security in South Africa* 161.
1055 Section 5 of the NWA makes provision for the development of a *National Water Resources Strategy* (NWRS). See also Department of Water and Sanitation (DWS) *National Water Resource Strategy Third Edition* (NWRS-3).
1056 DWS *National Water and Sanitation Master Plan* (2018).
1057 NPC *National Water Security Framework* 1-11.
1058 National Sanitation Policy (2016) 7-8.

services committee, all of which play a crucial part in water services provision.[1059] The law also allows for different approaches to the management and regulation of water resources, services, and institutions in the form of integrated water resource management (IWRM), water-sensitive urban design (WSUD), integrated urban water management (IUWM), and water conservation and water demand management, for example.[1060] In addition, there is also the requirement for integrated waste management to address increased waste recovery, prevent pollution and ecological degradation, ensure the integration of waste management services with water and sanitation, and ensure compliance with sewage treatment standards.[1061] The *Water Services Act* holds that all spheres of government bear the duty to provide water supply services in an efficient, equitable, and sustainable manner and that such water services must be sufficient for both subsistence and sustainable economic activity.[1062]

Energy provision is also part of the service delivery mandate of government. The provision of electricity occurs in three phases, namely generation, transmission, and distribution.[1063] The first two phases transpire at a national level through Eskom, while the distribution responsibilities are shared with municipalities as part of the matters that are administered through them, according to Schedule 4B of the Constitution.[1064] However, considering the energy insecurity the country is faced with, there is a greater move to localised energy provision through IPPs, provided that a municipality has the capacity to secure such agreements. The right to electricity, although not an explicit right, is argued to be an indirect or related right to the other services, as the rights to water, sanitation, and housing are all dependent on the provision of electricity.[1065] Due to the high dependence of the

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1059 Section 1(xxiii) of the *Water Services Act.*

1060 Steenkamp *City-level Law and Governance of Water Security in South Africa* 70-71.

1061 See ss 4(a), 11(4)(a)(ii), and 12(1) of NEMWA.

1062 Preamble of the *Water Services Act*.

1063 National Treasury *2008 Local Government Budgets and Expenditure Review* 109. See also Moyo *The Legal Autonomy of Municipalities in Energy Governance in South Africa* 7.

1064 National Treasury *2008 Local Government Budgets and Expenditure Review* 109; Schedule 4B of the Constitution.

1065 Dube and Moyo 2022 *PELJ* 4-9. See also *Eskom Holdings SOC Ltd v Vaal River Development Association (Pty) Ltd* 2023 4 SA 325 (CC) para 108

energy sector on coal-based generation, there has been a long and arduous fight for energy efficiency and renewable energy, as can be gleaned from the *White Paper on the Energy Policy of the Republic of South Africa* (1998),[1066] the *White Paper on the Renewable Energy Policy of the Republic of South Africa* (2003),[1067] *Energy Efficiency Strategy of the Republic of South Africa* (2005),[1068] both the *National Energy Act* 34 of 2008 and the *Electricity Regulation Act* 4 of 2006 which incorporate measures pertaining to energy efficiency,[1069] and the *National Climate Change Response White Paper* which highlights energy efficiency as one of its principal goals.[1070] In this vein, the *National Energy Act* pertains to the centralisation of provision of electricity services and serves to "promote integrated energy planning, security of supply, diversity of energy sources, data and information management, transformation, research and commercialisation of energy technologies, health and safety in the energy sector, and to contribute to sustainable development."[1071] Similarly, the *Electricity Regulation Act* deals with the regulation of electricity services, but it also outlines the functions and duties of municipalities as distributors or reticulators of electricity.[1072]

Within the law relating to the above services, the environmental right also plays an integral role and cannot be divorced from these services, as they are all interdependent and interrelated. The environmental right provided by the Constitution is also supported by the wide range of SEMAs dealing with aspects of waste, public spaces, air quality and GHG emission reduction that indirectly relate to environmental protection and conservation and climate change mitigation and adaptation measures. The legal protection of urban ecosystems also serves to

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1066 Department of Minerals and Energy *White Paper on the Energy Policy of the Republic of South Africa* 3.

1067 GN 513 in GG 26169 of 14 May 2004.

1068 Department of Minerals and Energy *Energy Efficiency Strategy of the Republic of South Africa* 1.

1069 Du Plessis 2015 *South African Journal of Science* 1.

1070 See Du Plessis 2015 *South African Journal of Science* 3-6.

1071 Section 2 of the *National Energy Act* 34 of 2008. See also Moyo *The Legal Autonomy of Municipalities in Energy Governance in South Africa* 11.

1072 See Moyo *The Legal Autonomy of Municipalities in Energy Governance in South Africa* 11-12; *City of Cape Town v National Energy Regulator of South Africa* 2020 JOL 49566 (GP); Du Plessis and Murombo "Energy" 24-5 - 24-10; Du Plessis *Energy Law in South Africa*.

enhance ecosystem services that are responsible for and that enable other services such as food provision, water filtration and reticulation, reducing climate impacts in cities such as the heat island effect, and in so doing can also lighten the burden on electricity provision and GHG reductions needed to make cities more resilient and sustainable.

3.3.3 Inclusive community structures and participation processes

The Constitution also provides procedural rights in the form of the rights to access to information,[1073] just administrative action,[1074] as well as access to courts.[1075] These rights make way for an inclusive society and public participation as required in many instances related to government decision-making. These rights are necessary not only to facilitate public participation and to strengthen community structures, but also to provide for transparency and accountability of government and promote good governance.[1076] They also ensure that the powers of government are exercised with discretion and do not infringe on the separation of powers.[1077] Public participation is a fundamental tenet in the country's participatory democracy and has its legal foundation in section 152(1) of the Constitution, supplemented by the MSA and Structures Act and is based on the Batho Pele principles set forth in the *Bhatho Pele – 'People First' White Paper on Transforming Public Service Delivery*.[1078] Furthermore, section 195 of the Constitution sets out basic values and principles governing public administration and stipulates that people's needs must be responded to and that the public must be encouraged to participate in policy-making,[1079] it must be accountable,[1080] and that transparency must be fostered

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[1073] Section 32 of the Constitution.
[1074] Section 33 of the Constitution.
[1075] Section 34 of the Constitution.
[1076] Hoexter *Administrative Law in South Africa* 17-20; Maphazi *et al* 2013 *African Journal of Public Affairs* 56; Orr 2016 *Constitutional Court Review* 58.
[1077] Hoexter *Administrative Law in South Africa* 72-74.
[1078] See Buccus 2021 *Journal of Public Affairs* 3; GN 1459 of GG 18340 of 1 October 1997; Hoexter *Administrative Law in South Africa* 80; *Doctors for Life International v Speaker of the National Assembly* 2006 6 SA 416 (CC); *Matatiele Municipality v President of the Republic of South Africa* (No 2) 2007 6 SA 477 (CC); *South African Iron and Steel Institute v Speaker of the National Assembly* 2023 ZACC 18 (CC) para 28-30.
[1079] Section 195(1)(e) of the Constitution.
[1080] Section 195(1)(f) of the Constitution.

through provision of timely, accessible, and accurate information.[1081] The law further provides for inclusive community structures and public participation through requiring all new legislation and amendments to existing legislation to go through a process of public comment.[1082] Public participation is also captured in the objects of local government, who must encourage the involvement of communities and community organisations in the matters of local government.[1083] It is postulated that citizens become more knowledgeable and empowered through public participation in decision-making processes and that it further fosters a sense of belonging, responsibility, and a vested interest in personal and community development.[1084] Cabinet also adopted the *Socio-economic Impact Assessment System* (SEIAS) in 2015 to strengthen policy creation, foster efficient and robust legislation and regulations and prioritise social cohesion, security, economic inclusion, economic growth, and environmental sustainability policies.[1085] In local government, such community participation is encouraged and facilitated through ward committees as envisioned in section 74 of the Structures Act. Ward committees have the purpose of enhancing constructive interaction between a municipality and the local community, and giving effect to sections 4 and 5 of the MSA, which allow citizens to contribute to the decision-making processes of a municipality and complain or make representations if they are not satisfied.[1086] Even if ward committees are not established, it is mandatory for municipalities to develop mechanisms to consult with and involve communities in the governing processes within their jurisdiction.[1087] Traditional authorities are another way in which communities can participate in the

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[1081] Section 195(1)(g) of the Constitution.

[1082] See *Mogale v Speaker of the National Assembly* 2023 6 SA 58 (CC) para 3; *Moutse Demarcation Forum v President of the RSA* 2011 11 BCLR 1158 (CC) para 47.

[1083] Section 152 (1)(e) of the Constitution; Malemane and Nel-Sanders 2021 *Africa's Public Service Delivery and Performance Review* 2; *Democratic Alliance v Ethekwini Municipality* 2012 2 SA 151 (SCA) paras 24 and 146; *Democratic Alliance of South Africa v City of Tshwane Metropolitan Municipality* 2019 JOL 41135 (GP) para 24; *South African Families Association v City of Cape Town* 2015 JOL 34615 (WCC).

[1084] Auriacombe and Meyer 2020 *Cent Eur J Public Policy* 7. See also Legislative Sector Support *Public Participation Framework for the South African Legislative Sector* 11-13; *South African Iron and Steel Institute v Speaker of the National Assembly* 2023 ZACC 18 (CC) para 30.

[1085] See Department of Planning, Monitoring, and Evaluation date unknown https://www.dpme.gov.za/keyfocusareas/Socio%20Economic%20Impact%20Assessment%20System/Pages/default.aspx; Umoh 2022 *Studia z Polityki Publicznej* 15.

[1086] Maphazi *et al* 2013 *African Journal of Public Affairs* 62.

[1087] Maphazi *et al* 2013 *African Journal of Public Affairs* 62.

decision-making processes of local government as envisaged in the *Traditional Leadership and Governance Framework Act*.[1088]

3.3.4 Nature-based urban planning

The Constitution provides for the protection and consideration of the environment,[1089] through providing that the environment as such must be protected. This right provides both positive and negative rights and duties and provides for environmental protection for human health and well-being, but also intrinsically for the environment.[1090] Though the law does not explicitly provide for ecosystem service protection, its inclusion is argued through the NEMA, as well as the SEMAs, such as NEMBA and NEMPAA. Nature conservation is generally considered, according to Schedule 4 of the Constitution, to form part of the mandates of national and provincial governments. However, the phrasing of sections 152 and 156 of the Constitution situates it among the incidental functions of local government as well. The NEMA and the SEMAs provide for a range of measures and instruments to be developed and implemented to bring about environmental protection that may also be utilised for urban climate resilience.[1091] These measures include listed restricted activities or activities subject to authorisation and regulations,[1092] declaration of bioregions or biodiversity areas,[1093] and the declaration of protected areas.[1094] When development is planned in an area, an EIA process is triggered to determine whether and to what extent the proposed development will impact the natural environment of the area. Furthermore, in the process of municipal planning, the municipality must include environmental aspects in its SDF and IDP, which also encompasses

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1088 41 of 2003.

1089 Section 24 of the Constitution.

1090 For an analysis of the positive and negative duties to protect the environment for the sake of the environment, instead merely for human benefit, see Du Plessis *Fulfilment of South Africa's Constitutional Environmental Right in the Local Government Sphere* 35-37; Kidd "Environment" 517; Eckersley 1990 *Theory and Society* 740; Kalamdhad 2018 *Indian Journal of Environmental Sciences* 61-62. See also generally Kotzé and French 2018 *Global Journal of Comparative Law* 9-17.

1091 See generally Botes *Legal Protection of 'Microclimate Regulation' as an Urban Ecosystem Service in South Africa* 52-59.

1092 See ss 24(2) and 44(1)(aA) of the NEMA. See also GN R983 in GG 38282 of 4 December 2014, GN R984 in GG 38282 of 4 December 2014; GN R985 in GG 38282 of 4 December 2014.

1093 Sections 39(1)(c) and 40 of the NEMBA.

1094 Section 2(a)-(c) of the NEMPAA.

environmental management tools and LUS that determine zoning of an area.[1095] Zoning through the LUS can also be geared toward environmental conservation areas or buffer zones to facilitate environmental protection and limit environmental harm. Planning instruments arguably play an important role in the enhancement of urban climate resilience, as the resilience of cities is influenced by the infrastructural layout of the city as well as the materials used. The primary source of planning law is the SPLUMA, which establishes a land use planning system that is aimed at being protective of the environment, addresses past injustices pertaining to land, is conscious of the effects of climate change, and provides for the sustainable and efficient use of land.[1096]

3.3.5 Suitable built environment

For improving the urban built environment, there should be considerations of disaster management, the urban environment, housing, airports, public transport, public works, planning and development, building regulations, electricity and gas reticulation networks, stormwater management systems, as well as wastewater and sewage disposal systems.[1097] This feature also relates closely to urban spatial planning.[1098] Many laws in South Africa are written with the past spatial injustices of apartheid in mind and are aimed at creating spatially diverse and integrated areas with well-located and affordable housing close to economic opportunities and a move toward transit-oriented development.[1099] Many of the elements of the built

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1095 See Van der Berg and Verschuuren "Introduction to Climate Resilient Cities and the Law" 7-8; See also Muir 2015 *SAPL* 557; Freedman 2014 *PELJ* 567-594; Humby 2014 *PELJ* 1660-1689; Du Plessis and Van der Berg 2014 *Stell LR* 580-594; Viviers, Retief and Cilliers "Land-use Management and Planning" 16-1 – 16-3.

1096 See Preamble of SPLUMA. See also, generally, Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management Act, 2013 (SPLUMA)" 254-259.

1097 Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management Act, 2013 (SPLUMA)" 254-259; Van Niekerk "Disaster Risk Reduction and Climate Change Adaptation and Resilience" 23-8.

1098 Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management Act, 2013 (SPLUMA)" 254; Van Wyk *Planning Law* 221-222.

1099 Kubayi "The Urban Land Question: Law as a Tool for Linking Affordable Housing to Transit-Oriented Development" 10; Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management Act, 2013 (SPLUMA)" 254.

environment fall into the scope of the executive and legislative power of local government's municipal planning functions, as stipulated in Schedules 4B and 5B to the Constitution, mentioned above.[1100] The building sector relies on regulations pertaining to building materials and performance-based regulations such as the South African National Building Regulations,[1101] and the South African National Standard (SANS) 10400 National Building Regulations (NBR), as established by the South African Bureau of Standards (SABS), and set out in guidelines and standards that govern the construction of buildings, ensures the safety and well-being of those who use them, and provide for energy efficiency and accessibility.[1102] Prior to the SPLUMA being enacted, local authorities were required by a range of provincial ordinances to regulate the use of land for development through town planning schemes (also known as rezoning or amendment schemes), the sub-division of land, consents for building line relaxations and site development plan approvals, along with the establishment of townships.[1103] The energy, water, and green-infrastructure sub-sectors that relate to buildings are also regulated through legislation such as, *inter alia*, the *Electricity Regulation Act*, *Water Services Act,* and the NEMWA.[1104] The regulatory regime also provides for stormwater management systems, bulk infrastructure upgrades and maintenance, as well as waste-water treatment plants.[1105] For instances when disaster strikes in urban areas, all municipalities are also required to have disaster management plans in line with the provisions of the *Disaster Management Act* 57 of 2002. Additionally, the newly enacted *Climate Change Act* provides that municipalities (however, only metropolitan and district municipalities) must undertake a Climate Change Needs and Response Assessment (CCNRA) followed by a Climate Change Response Implementation Plan (CCRIP).[1106]

1100 See Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management Act, 2013 (SPLUMA)" 259, 271, 273.

1101 See *National Building Regulations and Building Standards Act* 103 of 1977; and its amendment the *Standards Act* 8 of 2008.

1102 See SANS 10400 2023 https://sans10400.org.za/en/.

1103 See Wafula *Evaluating Energy Efficiency in Building Control Regulations in Local Authorities in South Africa* 30.

1104 Fuo, Zengerling and Sotto 2022 *Climate Law* 58; Van der Berg and Verschuuren "Introduction to Climate Resilient Cities and the Law" 7-8.

1105 Fuo, Zengerling and Sotto 2022 *Climate Law* 62-63; Van der Berg and Verschuuren "Introduction to Climate Resilient Cities and the Law" 7-8.

1106 See s 17 of the Climate Change Act.

The CCNRA aims to assess the extent to which these municipalities' constitutionally mandated functions are affected by climate change and formulate actionable steps to address these effects.[1107] The CCRIP is arguably a planning instrument, meant to complement and form part of metropolitan and district municipalities' planning instruments, policies and programmes.[1108] The transport system has a complex web of legislation and policy that is relevant to the regulation of this particular sector, such as the *National Roads Act* 7 of 1998, *Legal Succession to the South African Transport Services Amendment Act* 38 of 2008, with the primary mandate of providing rail commuter services, *Cross Border Road Transport Agency Act* 4 of 1998, *National Railway Safety Regulator Act* 16 of 2002, *Administrative Adjudication of Road Traffic Offences Act* 46 of 1998, *Civil Aviation Act* 13 of 2009 to enforce safety standards in the civil aviation industry, along with other initiatives such as the *National Land Transport Strategic Framework 2023-2028*,[1109] *Rural Transport Strategy*,[1110] *National Scholar Transport Policy*,[1111] and the *Revised Taxi Recapitalisation Programme*,[1112] *Bus Rapid Transport* (BRT),[1113] that are all aimed at mobility, safety and accessibility for commuters.

While the efficacy of the law as a means to enhance and promote urban climate resilience is deemed sufficient, the law is but one mechanism for contributing to urban climate regulation.

3.3.6 Coordinated and cooperative government

As mentioned above, governance is needed to support and maintain aspects under the social, economic and environmental spheres.[1114] Similarly, there is a need for

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[1107] Sections 17(1)(a) and (b) of the Climate Change Act

[1108] Section 17(1)(d) of the Climate Change Act.

[1109] South African Government 2023 https://www.gov.za/sites/default/files/gcis_document/202307/48873gon3634.pdf.

[1110] South African Government 2007 https://www.gov.za/sites/default/files/gcis_document/201409/ruraltransportstrategy-forsa2007new0.pdf.

[1111] GN 997 in GG 39314 of 23 October 2015.

[1112] South African Government 2024 https://www.gov.za/about-government/government-programmes/taxi-recapitalisation-programme.

[1113] South African Government 2024 https://www.gov.za/about-government/bus-rapid-transit-system-brt.

[1114] See para 2.3 above.

coordinated and cooperative government (and governance) to realise all the actionable features identified and included above to enhance and realise urban climate resilience in South African cities.[1115] This feature is inextricably linked with the objective of the present chapter, as "coordinated and cooperative governance" encompasses the legal framework (as the institutions) that contribute to urban climate resilience and speaks to the relevant law-making responsibility and authority of (local) government (as the agents).[1116] In other words, the agents are mandated and responsible for the implementation and enforcement of the law (institutions), while the institutions are also the cornerstone of what gives the agents (local government in this instance) their mandates through specific and applicable legislation. As alluded to above,[1117] the achievement of urban climate resilience depends on aspects of sufficient law enforcement and crime prevention, as well as the rule of law, underpinned by transparent and accountable governance, effective leadership and management,[1118] and a sustained and driven commitment to enhancing and mainstreaming urban climate resilience. Another aspect that is crucial for the formulation and implementation of legislation or policies that enhance climate resilience, is collaboration across multiple government agencies and departments (and other stakeholder engagement)[1119], interagency coordination, moving away from a siloed approach to governance (i.e., addressing horizontal and vertical fragmentation), and ensuring that legislation and efforts to enforce it are aligned and complementary.[1120] This means that all levels of government must collaborate on integrated urban governance and developmental planning, to ensure climate-resilient planning, infrastructure, and service delivery as envisioned in, for

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[1115] See paras 3.3.1-3.3.5 above.

[1116] See Figure 2-7 above. The institutions (legislation) applicable here include the Constitution, and, among others, the MSA, the Structures Act, and the *White Paper on Local Government*.

[1117] See para 2.5.6 above.

[1118] See ss 41 (principles of cooperative governance and intergovernmental relations), 151 (status of municipalities), and 154 (municipalities in cooperative government) of the Constitution. See also ss 13-15 of the NDP; ss 44 and 139 of the NUA.

[1119] See s 15 of the NDP; ss 13(g) and 101 of the NUA. S 2(4)(l) of NEMA (which advocates for cooperative governance in relation to sustainability through providing that "There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment"; A 10(2)(4) and 12 of the *National Climate Change Response White Paper* (2011); Preamble and ss 2(a), 31(2)(b), 31(3)(b), and 31(5) of Climate Change Act)also emphasises cooperative governance).

[1120] This is provided for in ss 40 and 41 of the Constitution.

example, the Constitution,[1121] the District Development Model (DDM),[1122] IUDF,[1123] the NDP,[1124] and the Guideline on Mainstreaming Climate Responsiveness and Resilience into Urban Planning.[1125]

3.4 Law-making responsibility and authority of local government

Given the increasing importance of local authorities, local governments have the mandate and power, through national constitutional law, to provide for infrastructure, manage local planning processes, establish local policies and regulations, and, to a certain extent, implement national and provincial laws and policies.[1126] They also bear the responsibility *vis-à-vis* the objects of local government in the Constitution and the constitutional environmental right, to promote human resilience, improve lives and livelihoods and to foster sustainable development, which can, due to the interrelatedness with urban climate resilience, also comprise a responsibility to advance urban climate resilience as part of their functions and duties. However, municipal climate action and tools such as climate change plans are often not implementable without legal instrumentation for their enforcement.[1127] By-laws are one of the many instruments available to municipalities that arguably can assist municipalities in implementing climate action and enable them to enhance urban climate resilience. The authority of local government to make and use legal instruments is found in the Constitution and subsequent national legislation mandating its executive and legislative authority.[1128]

[1121] See s 153-154 of the Constitution.

[1122] CoGTA 2020 https://www.cogta.gov.za/ddm/index.php/about-us/.

[1123] Which provides a policy framework for restructuring urban systems to be more inclusive, resource-efficient, and adaptable to climate change.

[1124] See s 14 of the NDP.

[1125] CSIR 2024 *Guideline on Mainstreaming Climate Responsiveness and Resilience into Urban Planning* 1-2, which guides and empowers municipalities with the integration of climate considerations into their strategic planning processes and instruments.

[1126] Du Plessis "Climate Governance in South African Municipalities: Opportunities and Obstacles for Local Government" 355.

[1127] See, for example, Winter 2022 *The Municipal Role in Climate Policy* 4-10; Measham *et al* 2011 *Mitig Adapt Strateg Glob Change* 889–909.

[1128] See 3.4.2 below. See also Fuo *Local Government's Role in the Pursuit of the Transformative Constitutional Mandate of Social Justice in South Africa* 12-13, 35, 70, 82-119; Fuo 2015 *African Human Rights Law Journal* 170-174; Fuo 2015 *Commonwealth Journal of Local Governance* 17-19.

As elucidated above,[1129] local government in South Africa consists of municipalities and is one of the three autonomous and distinct but interdependent, interrelated spheres of government.[1130] All three spheres of government are obliged to "secure the well-being of the people";[1131] "provide effective, transparent, accountable and coherent government";[1132] and "exercise their powers and perform their functions in a manner that does not encroach on the geographical, functional or institutional integrity of government in another sphere".[1133] The powers and functions of municipalities are further set out in section 156 of the Constitution. The executive and legislative authority of local government is established in chapter 7, read with Schedules 4B and 5B of the Constitution, and includes any other matters assigned by national or provincial legislation to local government. Further to this, section 156(4) widens the reach of local government's powers and functions. It does so through the notion of subsidiarity, by which matters related to local government that fall within parts A of Schedules 4 and 5 in the Constitution must also be assigned to local government if it would most effectively be locally administered and where the municipality has the required capacity.[1134] Additionally, section 156(5) determines that municipalities have "the right to exercise any power reasonably necessary for, or incidental to, the performance of their functions and powers."[1135]

Municipalities are organs of state that exercise legislative and executive authority within the local demarcated area as per the *Local Government: Municipal Demarcation Act* 27 of 1998. Municipalities consist of both political and administrative structures, along with the local community and civil society. Local government also has "the right to govern, on its own initiative, the local government affairs of its community" as long as it is in line with national and provincial government, and may perform its executive and legislative authority without undue

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1129 See para 3.2 above.
1130 Steytler and De Visser *Local Government Law in South Africa* 1-31; ss 40(1) and 151 of the Constitution.
1131 Section 41(1)(b) of the Constitution.
1132 Section 41(1)(c) of the Constitution.
1133 Section 41(1)(g) of the Constitution.
1134 Section 156(4) of the Constitution.
1135 Section 156(5) of the Constitution.

interference by national or provincial government.[1136] Along with the status of municipalities set out in section 151 of the Constitution, section 152 sets out the objects of local government. Among these are the objectives to provide democratic and accountable local governance, provision of services to communities in a sustainable manner; promotion of social and economic development; the promotion of a safe and healthy environment; and lastly, to encourage the involvement of communities and community organisations in the matters of local government. The Constitution also provides for developmental local government with succinct developmental duties.[1137]

In line with these constitutional provisions, the Constitution and national legislation also set forth certain responsibilities and obligations of local government. This includes, for example, the constitutional environmental right set out in section 24 of the Constitution that provides that "reasonable legislative and other measures" be used to realise this right. Schedules 4B and 5B of the Constitution contain several local government matters with environmental implications that may carry relevance to urban climate resilience (for example, air pollution, building regulations, municipal planning, among others) over which municipalities have legislative authority. Furthermore, the development of by-laws is required and finds application in some of the sector-specific national environmental legislation, such as section 21 of the *Water Services Act*, section 11 of NEMAQA, section 18 of the NEMICMA, and section 49 of the NEMPAA.

Municipalities can exercise their legislative authority by developing and adopting policies, plans, strategies and programmes, passing by-laws and taking decisions on any of the matters in section 11(3) of the MSA, and doing anything else within their legislative competence.[1138] Section 11 also holds that a municipality may give effect

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[1136] Section 151(3) and (4) of the Constitution.

[1137] See para 1 of "Section B: Developmental Local Government" in the *White Paper of Local Government* (1998); ss 152 and 153 of the Constitution; Fuo *Local Government's Role in the Pursuit of the Transformative Constitutional Mandate of Social Justice in South Africa* 89-100; s 1 of the MSA.

[1138] Sections 11-13 of the MSA read with Schedules 4B and 5B of the Constitution; s C of the *White Paper on Local Government* (1998); Nel, Du Plessis and Retief "Key Elements for Municipal

to its executive and legislative mandates by promoting a safe and healthy environment. By-laws are considered local command-and-control regulatory instruments.[1139]

To this end, municipalities are mandated by section 156(2) of the Constitution to create and administer by-laws for the effective administration of the matters within their functional and assigned powers. These by-laws are still subject to national and provincial legislation. The MSA confirms the executive and legislative authority of local governments and provides more information on what this authority entails, especially as relates to by-laws. Section 12 of the MSA determines that by-laws are subject to specific requirements, such as that draft by-laws may only be introduced by members or committees of the municipal council. Furthermore, section 12(3) holds that by-laws may not be passed unless all council members have been given reasonable notice, and such proposed by-law has been published for public comment in line with this provision. Section 13 pertains to the publishing of adopted by-laws in the Provincial Gazette, and, other practical ways, including local newspapers, to bring their contents to the attention of the public.[1140]

Importantly, section 14(1) of the MSA makes provision for "standard draft by-laws", while NEMA provides for so-called "model environmental management by-laws".[1141] These "blueprint-type instruments" function in the same way as by-laws as discussed above, but are not drafted by municipalities themselves and are aimed at assisting municipalities that do not have the in-house skills, resources or capacity to draft their own by-laws.[1142] Standard or model draft by-laws are originally published by the Minister (in the case of national government) or the MEC (in the case of provincial government) responsible for local government and organised local government. Municipalities are free to amend and adopt such by-laws, if they wish,

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Action" 2-6; Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-32 - 3-60.

[1139] Du Plessis *Environmental Law and Local Government in South Africa* 3-15.

[1140] Section 13(a) of the MSA.

[1141] Section 46 of the NEMA.

[1142] South African Research Chair in Cities, Law and Environmental Sustainability 2022 https://law.nwu.ac.za/sarchi-cles-chair/standard-draft-blueprint-environmental-management-law-south-african.

subject to their own local circumstances and needs. As standard or model draft by-laws purely serve as an example by-law, subject to the voluntary adoption and implementation by municipalities, there is no provincial or national obstruction to local government law-making authority.

3.5 Concluding remarks

This chapter set out to determine how the law contributes to urban climate resilience with specific reference to the South African urban context, as well as to critically analyse the relevant law-making responsibility and authority of local government in South Africa.

Through this discussion, it has become clear that the law is robust and widely encompassing and has several sources that can be deemed relevant to enhancing urban climate resilience in the South African urban context. There are several instruments and policies that speak to the realisation of urban resilience and address the impact of climate change, as well as response measures that may be used to adapt to and recover from and generally enhance the urban climate resilience of a country. The law can thus be regarded as an enabling mechanism for promoting urban climate resilience, however, it is just one mechanism, amongst others, that may prove effective, and it cannot be relied on in isolation.

The scope of the study required the researcher to critically analyse the place of legislation as a source of law and specifically as applicable to the local government level. By doing this, it was illustrated that some of the features are susceptible to legislative intervention or regulation and could be subject to local government legislative regulation through by-laws, as many aspects of the features distilled in Chapter two, fall within the legislative competence of local government according to the Constitution and MSA. It is evident, however, that not all features are susceptible to such regulation, and while some may be wholly susceptible, others may only be partially susceptible. This is ascribed to the specific context the study focuses on, and the exclusion of some of the features is based on the legislative parameters within which they were applied.

The chapter considered which of the features distilled from Chapter two above are susceptible to regulation by the law, and legislative regulation, in particular. This was done to scope which features can be regulated through the law. These features were then used to further determine which of the identified features fall within the legislative regulatory powers of municipalities.

In lieu of the repeated focus on and distinct importance of spatial planning in this and the preceding chapter, the study now moves into a discussion on the role of municipal by-laws pertaining to spatial planning and land use management for urban climate resilience.

CHAPTER 4 THE ROLE OF SPLUM BY-LAWS IN ENHANCING URBAN CLIMATE RESILIENCE

4.1 Introduction

The phenomena of urbanisation, urban growth, and urban development, along with related increased social and environmental pressures and high levels of informality, create the need for the complex and dynamic discipline of planning.[1143] The relevance of spatial planning and land use management has already been alluded to.[1144] Spatial planning and land use management are central to the urban climate resilience discourse, as they encapsulate the necessary ingredients for reshaping the urban environment. The urban environment essentially covers all human-constructed infrastructure, water, energy, information, and transportation networks characteristic of this environment.[1145] This means that the spatial structure thereof, as well as how these environments are created, should consider the effects of climate change.[1146] Spatial planning and land use management are key local government functions,[1147] and municipal planning by-laws offer one of the tools or instruments at its disposal to realise its constitutional mandate of municipal planning. As such, an integrated approach to municipal planning may be needed to adequately incorporate urban climate resilience into planning.[1148]

By-laws, as discussed above,[1149] seem suitable in this context as they are one of the few instruments available in the planning law realm with legal effect that falls within the ambit of local government's legislative powers. They allow municipalities to enforce and implement their planning mandate and vision against third parties in

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1143 Kimberly *The Nature, Scope, and Purpose of Spatial Planning in South Africa* 8.
1144 See, for example, paras 2.3 and 2.4, and 3.3 above.
1145 See para 2.2.4 above.
1146 Venema and Temmer *Building a Climate-resilient City: The Built Environment* 2. See also paras 2.2.2-2.2.4 above.
1147 See para 4.3 below.
1148 Cilliers *et al* 2022 *Frontiers in Sustainable Cities* 2. See also para 4.2.2 below.
1149 See para 3.4 above.

their jurisdictions.[1150] By-laws, unlike other planning instruments such as IDPs, SDFs and LUMs are legislative instruments.

This chapter aims to determine the role of SPLUM by-laws, and the extent to which such by-laws can enhance urban climate resilience. In doing so, the chapter includes a broad contextual background of spatial planning and land use management in South Africa and describes the legal framework informing municipal planning. After this contextualisation, the discussion focuses on SPLUM by-laws. It focuses on the design and function of spatial planning and land-use management by-laws in analysing their scope and content. The focus then shifts to whether there is room for innovation and discretion relating to applicable regulated areas and activities under focus in these by-laws. After the function of SPLUM by-laws has been established, its functional relevance for urban climate resilience specifically will be determined. This is done by scrutinising the regulatory, institutional, and guiding roles of the SPLUM by-laws.

4.2 Spatial planning and land use management in South Africa

4.2.1 Contextual background

The country's urban form is a patchwork of distorted spatial patterns, inadequate and poorly kept public transport infrastructure, unequal access to economic and social opportunities, growing and poorly situated low-income settlements, and visible and persisting spatial inequality.[1151] Meanwhile, municipalities in South Africa have been plagued by high levels of dysfunction and corruption, while struggling to maintain adequate levels of service delivery, in many parts of the country,[1152] even

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[1150] Bronstein 2015 *The South African Law Journal* 655.

[1151] Du Plessis and Boonzaaier 2015 *International Planning Studies* 88; Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 10; Turok, Seeliger and Visagie 2021 *Progress in Planning* 2-3; Van Niekerk 2018 *Town and Regional Planning* 69; Huchzermeyer *et al* 2019 *Town and Regional Planning* 93-94. See also para 4.2.1.2 below.

[1152] See Huchzermeyer *et al* 2019 *Town and Regional Planning* 100; Masibigiri *Institutional Factors Affecting Service Delivery in the City of Johannesburg* 18-19, 23, 31-38; Thusi and Selepe 2023 *International Journal of Social Science Research and Review* 688-689; SACN *State of South African Cities Report 2021* 259-267; Mamokhere 2022 *Commonwealth Youth and Development* 1-5; Ragolane and Malatji 2024 *Journal of Public Administration, Finance and Law* 371-372, 375-376; Everatt and Pieterse 2022 *Journal of Southern African Studies* 792-797.

without the added burden of having to respond to the effects of climate change.[1153] It is in this complex spatial milieu that government authorities have to navigate and manage urbanisation patterns, different land use forms,[1154] and the physical environment in cities. They have to contend with the pre-existing divided urban form to ensure, among others, adequate and sustainable service delivery, protection of fundamental human rights, a sustainable urban economy, a safe and accessible urban environment, environmental protection, and integrated urban planning and governance.[1155] This is further complicated by the "complex interactions between a diverse range of governmental and non-governmental role-players and stakeholders" needed for the governance and planning of urban spaces.[1156] Management and governance of urban spaces are, however, possible through planning to balance and regulate competing interests and the need for urban development and growth.[1157] As such, planning has emerged "in response to political pressure over the opportunities, losses and inequalities associated with urban change."[1158] Planning is essentially about regulating what land may be used for, and prescribing how it may or may not be used.[1159]

Planning "at its most basic and generic level" can be defined as the conscious act or method of influencing future outcomes.[1160] Planning is referred to as spatial planning when concerned with spatial and geographical components.[1161] The use of the terms "planning", "land use planning", "spatial planning", and "land use

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[1153] See Santhia, Shackleton and Pereira 2018 *Development South Africa* 590; SACN *Cities and Climate Change: Building Resilience* 1-3; Pieterse, Du Toit and Van Niekerk 2021 *Development Southern Africa* 493-495.

[1154] Van Wyk reasons that "land" plays an indispensable role in both planning and environmental management - Van Wyk "The Law on Planning and the Environment" 1134-1138. Land is defined in legislation as "any erf, agricultural holding or farm portion, and includes any improvement or building on the land and any real right in land" – s 1 of SPLUMA. See also Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 8.

[1155] Rydin *The Purpose of Planning: Creating Sustainable Towns and Cities* 13.

[1156] Pieterse, Du Toit and Van Niekerk 2021 *Development Southern Africa*.

[1157] Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 115; OECD *The Governance of Land Use in OECD Countries: Policy Analysis and Recommendations* 13-14; Rydin *The Purpose of Planning: Creating Sustainable Towns and Cities* 8-9.

[1158] Rydin *The Purpose of Planning: Creating Sustainable Towns and Cities* 7; Hartmann and Gerber "Land, Scarcity, and Property Rights" 3.

[1159] Van Wyk "The Law on Planning and the Environment" 1134.

[1160] Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 126.

[1161] Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 126.

management" is variable and confusing in the literature and reflects subtle differences. However, land use planning and spatial planning seem to denote the same thing and are often used interchangeably.[1162] Land use and land use management, however, concern the activities, purposes of, and functions ascribed to land as the subject matter, specifically.[1163] According to section 1 of SPLUMA, "land use" means:

> … the purpose for which land is or may be used lawfully in terms of a land use scheme, existing scheme or in terms of any other authorisation, permit or consent issued by a competent authority, and includes any conditions related to such land use purposes.[1164]

SPLUMA also provides that "land development" concerns the "erection of buildings or structures on land, or the change of use of land", and this includes the establishment of townships, subdivisions or consolidation of land, or any deviation from the land uses permitted in terms of an applicable LUS.[1165] These concepts all form the focus of planning law. Some authors distinguish between strategic spatial planning and operational spatial planning.[1166]

At its core, spatial planning seeks to address the complex interactions between human activities, infrastructure, and the natural environment within specific geographical areas to achieve a balanced and justiciable distribution of resources and opportunities that result in inclusive, resilient, and sustainable communities.[1167] In this context, spatial planning involves the strategic allocation and management of land to achieve social, economic and environmental objectives, and encompasses

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1162 See De Visser 2016 *The Ugandan Journal of Management and Public Policy Studies* 5.

1163 Van der Berg describes land use management as "the process by which land is evaluated and assessed for the purposes of determining, distributing and administering land use" and "a practical activity that entails assessing past trends, making projections, and setting out the constraints and opportunities for the future development of a specific spatial area". See Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 126-127.

1164 Section 1 of SPLUMA.

1165 Section 1 of SPLUMA.

1166 See, inter alia, Halleux, Marcinczak and Van der Krabben 2012 *Land Use Policy* 888; Van der Berg 2022 *European Journal of Risk Regulation* 4; Van der Berg *Municipal Planning Law for Sustainable Cities in South Africa* 133-136.

1167 See Carter 2007 *The Geographical Journal* 330; Albrechts 2004 *Environment and Planning B: Planning and Design* 744.

land use and land use management.[1168] Furthermore, spatial planning in South Africa is of paramount importance, as it is argued to be a critical tool for redressing the spatial patterns remnant of the legacy of apartheid; fostering sustainable land use, resource management, and infrastructure development; and promoting integrated and inclusive communities where all citizens have access to opportunities, services, and amenities.[1169] Land use planning, accordingly, consists of intentional and coherent decisions and activities by local authorities and other role-players involved in spatial planning, aiming to resolve the problem of uncoordinated land and urban development and its related challenges.[1170] This requires forward thinking and planning, and using the space within the city creatively to garner different societal, political, and environmental outcomes, in a way that allows for resilience and adaptability. Effective spatial planning can facilitate the optimal allocation of resources and promote economic activities that contribute to development and economic growth. Spatial planning encourages participatory decision-making and community engagement, ensuring that the diverse needs and aspirations of the population are considered in the planning process. Spatial planning can arguably play a vital role in enhancing urban climate resilience by identifying vulnerable areas, implementing climate-adaptive infrastructure, and promoting nature-based solutions to address climate-related risks.

The concept of spatial planning, therefore, incorporates a multidimensional integrated approach that goes beyond physical land use and extends to socio-economic factors, demographic patterns, and environmental considerations.[1171] Spatial planning, by its nature, also affects the sectoral planning functions of authorities that relate to transport and mobility infrastructure, housing, land

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[1168] Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 8; Kimberly *The Nature, Scope and Purpose of Spatial Planning in South Africa* 8-9.

[1169] Nel 2016 *Land Use Policy* 257; Van Wyk *Planning Law* 12-13. SPLUMA also recognises the constitutional imperative of environmental protection for the benefit of current and future generations in accordance with the idea of sustainable development, which arguably correlates to having a land-use planning system that ensures this and aims to realise other constitutional imperatives. See preamble, s 3(b) – (d) of SPLUMA. See also Van Wyk *Planning Law* 7.

[1170] Gerber, Hengstermann and Viallon "Land Policy: How to Deal with Scarcity of Land" 13.

[1171] Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 127. See further also the discussion of the interconnection of these terms in para 4.2.2.1 below.

administration, property rights, infrastructure development, environmental protection, and biodiversity conservation.[1172] Through the use of integrated, multi-dimensional and -sectoral planning approaches, the silo-based nature of the operations of government agencies can arguably be eliminated and cooperative governance can be promoted.[1173] Additionally, such an approach may result in the general delineation of functions providing better planning that considers and balances the interests of different sectors without favouring any one of them over the other.[1174] As such it is argued that good planning practices may also promote urban climate resilience.[1175]

4.2.2 Legal framework for spatial planning and land use management

The historical evolution of spatial planning and land use management and the contemporary planning law regime in South Africa is well documented.[1176] Van der Berg[1177] postulates that South Africa's planning law prior to the 1990's had influences from modernist planning practices, which mainly consisted of single-use zoning and low-density development, and contained Greek, Roman, English, and Dutch influences.[1178] However, given the effects of climate change and vastly changing urban circumstances, multi-modal, accessible, affordable, safe, and high-density development is preferable for urban resilience and sustainable development.

1172 Van der Berg *Municipal Planning Law for Sustainable Cities in South Africa* 121-122; De Visser 2016 *The Ugandan Journal of Management and Public Policy Studies* 84; Van Wyk *Planning Law* 17.

1173 OECD *The Governance of Land Use in OECD Countries: Policy Analysis and Recommendations* 24.

1174 See Nel, Du Plessis and Retief "Key Elements for Municipal Action" 3-52; Carter 2007 *The Geographical Journal* 330-332.

1175 See Pieterse, Du Toit and Van Niekerk 2021 *Development Southern Africa* 494, 506.

1176 See Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 137-141; Van Wyk *Planning Law* 1-10; Makoni *Law, Spatial Planning & The Making of South African Cities* 109-140; Monama, Mokoele, and Mokgotho 2022 *International Journal of Entrepreneurship* 1; De Visser 2016 *The Ugandan Journal of Management and Public Policy Studies* 85-91, 94-96; Kloppers and Pienaar 2014 *PELJ* 678-680; *National Climate Change Response White Paper* 21; IUDF 22-23.

1177 Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 10.

1178 See also Van Wyk *Planning Law* 26-33.

South African planning law was characterised as fragmented, unequal and discriminatory pre-democracy (i.e., pre-1994),[1179] and even for a short time after the advent of democracy in the country,[1180] until the enactment of the SPLUMA[1181] almost two decades later.[1182] SPLUMA was promulgated in 2013, providing a comprehensive legal framework for spatial planning and land use management at the local government level. Nevertheless, the remnants of apartheid planning persist, especially in big urban conglomerations. Moreover, the integrated planning system envisioned in SPLUMA is still impeded by some of the old planning legislation, such as the four township and town planning ordinances[1183] and land use

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1179 Under the Union of South Africa, town and regional planning was situated with the provincial governments of the time and determined by provincial law, also known as Ordinances. However, non-white areas were subjected to national planning laws and regulations. During the apartheid era, legislation such as the *Black Land Act* 27 of 1913, the *Development Trust and Land Act* 18 of 1936, the *Black Administration Act* 38 of 1966, *Group Areas Act* 41 of 1950 and *Group Areas Act* 36 of 1966, and the *Community Development Act* 3 of 1966, enforced spatial segregation based on racial classifications, leading to the forced removal of non-white populations from urban centres to designated townships and prohibitions on the use of certain land by non-white South Africans. In the past, planning law was thus used as an instrument of racial segregation and stringent control rather than integration and development. See De Visser 2016 *The Ugandan Journal of Management and Public Policy Studies* 89; Van Wyk *Planning Law* 2-3.

1180 The dismantling of apartheid in the early 1990's paved the way for a new spatial planning law paradigm, doing away with the monopoly of provincial government over planning and distributing planning authority across the three spheres of government under the new dispensation. This also heralded initiatives such as the Reconstruction and Development Programme (RDP), which was facilitated by the *Development Facilitation Act* 65 of 1995 (DFA) and aimed to address historical inequalities, promote social integration, promote pro-poor infrastructure, and provide access to basic services for all citizens. This marked the beginning of a shift towards a more inclusive and integrated spatial planning law framework. Before SPLUMA, the most significant legislative measures on planning were provided in the DFA, which introduced general principles for land development legislation and decision-making, and the MSA regulating integrated development planning by local government. However, the DFA, together with several other acts (such as the *Less Formal Township Establishment Act* 113 of 1991, *Physical Planning Act* 88 of 1967, *Physical Planning Act* 125 of 1991, and the *Removal of Restrictions Act* 84 of 1967), were declared constitutionally invalid and have been repealed given the unintended consequence of the parallel system it had created, and the concomitant fragmentation and legal uncertainty it caused. See also Van Wyk *Planning Law* 57.

1181 16 of 2013.

1182 See Van Wyk *Planning Law* 26-62.

1183 They have no application to the former "independent" homelands (Transkei, Bophuthatswana, Venda and Ciskei) and self-governing territories (Gazankulu, KaNgwane, KwaNdebele, KwaZulu, Lebowa and QwaQwa). See *City of Johannesburg Metropolitan Municipality v Gauteng Development Tribunal* 2010 (9) BCLR 859 (CC) paras 32, 77.

and planning regulations that are in effect and have not been repealed or declared invalid.[1184]

Spatial planning in South Africa has thus evolved from a history of apartheid-driven spatial segregation to a forward-looking approach that seeks to promote inclusive, sustainable, and resilient communities.[1185] By strategically allocating and managing land and resources, spatial planning aims to address historical inequalities, foster sustainable development, and promote social cohesion in a rapidly urbanising and changing environment.[1186]

Van Wyk defines "planning law" as the -

> area of law that provides for the creation of a sustainable land management planning framework as well as for land development management with the purpose of ensuring the health, safety and welfare of society as a whole, while taking account of overarching interests such as the environment, housing, agriculture and transport…*[and refers to]* the regulation and management of the spatial environment or the use of land in a social context…and is concerned with the determination, allocation, and alteration of land uses.[1187]

This definition distinguishes "two distinct, yet interrelated subdivisions" that attempt to address the ambiguous nature of the terms above, namely "land management planning" and "land development management".[1188] Van Wyk, on the one hand, describes land management planning as the compilation of a spatial vision, plan, framework, or blueprint of future developments or land uses that supports sustainable development, and which concerns all aspects of planning, including limitations, restrictions on land use, or deprivation of property.[1189] In line with this argument, land management planning comprises several planning instruments such

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[1184] These include, for example, the *Township Ordinance* 9 of 1969; the *Town-planning and Township Ordinance* 15 of 1986; Proc R1897 in GG 10431 of 12 September 1986 (*Regulations relating to Township Establishment and Land Use*); and GN R1886 and GN R1888 in GG 12691 of 12 August 1990, amongst others. See also *City of Johannesburg Metropolitan Municipality v Gauteng Development Tribunal* 2010 (9) BCLR 859 (CC) para 30.

[1185] See the Preamble of SPLUMA.

[1186] See the Preamble of SPLUMA.

[1187] Van Wyk *Planning Law* 10, 18-19.

[1188] Van Wyk *Planning Law* 11.

[1189] Van Wyk Planning Law 11. See also De Visser 2016 *The Ugandan Journal of Management and Public Policy Studies* 88.

as IDPs, SDFs, LUSs and other restrictive conditions placed on the use of land.[1190] On the other hand, the author further argues that land development management concerns the administration and regulation of land use changes, i.e., the processes and procedures to change and manage land, which invariably involves decision-making of an administrative nature.[1191]

In support of the definition above and considering the composition of land use planning law, Kimberly[1192] submits that "land use planning alludes to forward spatial planning, land use management, and land development management." She further maintains that the latter two are influenced by or operate alongside the former.[1193] The difference, however, is that spatial planning is guiding, informative and persuasive in purpose and serves to ensure "coordination between sectors and government institutions",[1194] while land use management and land development management are more prescriptive by nature and aim "to ensure that land uses and development rights are demarcated and prescribed."[1195] It is within the ambit of planning law that the state's planning functions, mandates, and authority are prescribed and regulated, along with the procedures for planning.

Planning law, therefore, encompasses a composite legal framework that guides spatial planning and land use management and regulates development activities in the different spheres of government.[1196] It covers a range of laws, regulations, and by-laws that collectively guide urban and rural development, environmental protection, and the utilisation of land and resources.[1197] This area of law sanctions the use of legal instruments by government authorities to guide and control urban

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1190 See para 4.3 below.

1191 Van Wyk *Planning Law* 221. This is also known as land development control, land administration or land regulation and "pertains to the 'collective management of local environments', and is often, but not always, linked to spatial plans and the implementation thereof."- Nel 2016 *Land Use Policy* 258. See also De Visser 2016 *The Ugandan Journal of Management and Public Policy Studies* 88-89.

1192 Kimberly *The Nature, Scope and Purpose of Spatial Planning in South Africa* 9.

1193 Kimberly *The Nature, Scope and Purpose of Spatial Planning in South Africa* 9.

1194 Kimberly *The Nature, Scope and Purpose of Spatial Planning in South Africa* 9. This clearly denotes the forward planning aspect referred to in para 4.2.1.1 above. See also Van Wyk *Planning Law* 221.

1195 Kimberly *The Nature, Scope and Purpose of Spatial Planning in South Africa* 9.

1196 See Van Wyk *Planning Law* 19, 61, 64.

1197 See Van Wyk *Planning Law* 19, 61.

and rural development and conceptualises rights, restrictions and responsibilities pertaining to land, land use, and property.[1198]

The primary function of planning law is to establish the principles and processes for spatial planning, which involves the formulation of long-term visions, development goals, and spatial strategies for urban and rural areas.[1199] In the context of planning law, spatial planning seeks to achieve sustainable and integrated development, balanced land use, and equitable distribution of resources.[1200] Planning law sets out the rules, regulations, and procedures for land use management, including zoning regulations, subdivision controls, and development permits.[1201] Land use management contributes to planning law by ensuring that land is utilised in a manner that aligns with the spatial planning objectives and adheres to environmental standards.[1202] It also provides the legal mechanisms to regulate development activities, ensuring that proposed projects and developments comply with land use regulations, building codes, and environmental impact assessments. In this vein, it is arguably also aimed at promoting and achieving sustainability and resilience in the urban space. This tenet is supported by the notion of integrated development envisioned in the Constitution[1203] and the MSA,[1204] as well as the development principles of spatial sustainability and spatial resilience, as included in SPLUMA.[1205]

While the definitions posited by Van Wyk and Kimberly notably include aspects of sustainable development and forward planning, they do not venture beyond broad mention of sector and government coordination and vague reference to ensuring the health, safety and welfare of society and the overarching interests of the environment, housing, agriculture and transport. They touch only on aspects of

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1198 Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 127; Deininger *et al Innovations in Land Rights Recognition Administration and Governance* xvi.
1199 Preamble and s 3 of SPLUMA.
1200 Preamble of SPLUMA. See also Nel 2016 *Land Use Policy* 259.
1201 See Van Wyk *Planning Law* 289.
1202 See Preamble of SPLUMA.
1203 Sections 152 and 153 of the Constitution.
1204 See Long title, Preamble and s 23 of the MSA.
1205 See Preamble and ss 6 and 7 of SPLUMA.

managing and regulating land use. They do not go further in stipulating to what end these should be undertaken. They also do not incorporate the development principles envisioned in SPLUMA and neglect to fully incorporate the fast-changing urban development dynamics in South Africa, especially in the face of urbanisation, migration, land occupation, and climate change. The definition could arguably be extended to include aspects of resilience, mitigation or adaptation responses to the effects of climate change or aspects of urban climate resilience, specifically, and flexibility to allow for unplanned change. As such, planning law, can *also* be described as an area of law that provides a sustainable framework for land use development and management planning, that

a) ensures the health and wellbeing of society as a whole;[1206]

b) takes into account overarching interests of and developments in LED and sustainable livelihoods, adequate basic services, inclusive community structures and processes, nature-based urban development, suitable built environments along with coordinated governance in relation to spatial planning and land use management;[1207]

c) is based on the development principles of spatial sustainability, spatial justice, spatial resilience, efficiency, and good administration;[1208]

[1206] Health and wellbeing incapsulates health, safety and welfare used in the original definition of Van Wyk. See Van Wyk *Planning Law* 10, 18-19.

[1207] This references the actionable features for urban climate resilience proposed in chapter 2 of the study and, as such, includes the economic, social, environmental, and governance spheres and contexts, and inadvertently also the systems, agents, and institutions suggested in the model used in that chapter. See paras 2.3-2.5 above.

[1208] This brings the development principles, which are central to spatial planning and land use management, as envisioned by SPLUMA, into the definition. This is in line with s 6(1) of SPLUMA provides that the general principles set out in this Chapter apply to all organs of state and other authorities responsible for the implementation of legislation regulating the use and development of land, and guide - (a) the preparation, adoption and implementation of any spatial development framework, policy or by-law concerning spatial planning and the development or use of land; (b) the compilation, implementation and administration of any land use scheme or other regulatory mechanism for the management of the use of land; (c) the sustainable use and development of land; (d) the consideration by a competent authority of any application that impacts or may impact upon the use and development of land; and (e) the performance of any function in terms of this Act or any other law regulating spatial planning and land use management.

d) is cognisant of unplanned development, changing circumstances, municipal capacity, and climate change;[1209] and

e) enables suitable mitigation and adaptation and disaster management responses, and preventative measures.[1210]

As alluded to above,[1211] planning occurs in the different government spheres in South Africa. Schedules 4 and 5 of the Constitution also allocate different planning powers, distinct responsibilities, and competencies to each of the three spheres.[1212] Not only do the spheres of government have responsibilities in terms of planning law, but so do the three branches of government, in that the legislative branch is responsible for making laws related to planning,[1213] the executive is responsible for giving legal effect to the rules,[1214] while the judiciary serves to enforce and preside over the law and planning law conflicts through the courts.[1215]

The Constitution allocates "urban and rural development" as well as "regional planning and development" to national and provincial governments concurrently, which means both spheres may administer and legislate on these powers and functions.[1216] It further lists "provincial planning" as an exclusive competence of provincial government.[1217] Lastly, the Constitution gives local government exclusive competence to legislate and administer "municipal planning" and, in addition, includes building regulations, health services, public transport, public works, and water and sanitation, all of which involve a very distinct planning aspect.[1218] Additional responsibilities of provincial government, according to SPLUMA, include developing mechanisms to support, monitor and strengthen the capacity of

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[1209] This speaks to the unpredictability, flexibility, and adaptation aspects that are part and parcel of urban climate resilience. See para 2.2.4 above.
[1210] This incorporates resilience thinking and disaster preparedness and awareness into the definition. See para 2.2.4.2 above.
[1211] See para 4.2.1.2. above.
[1212] See also *City of Johannesburg Metropolitan Municipality v Gauteng Development Tribunal* 2010 9 BCLR 859 (CC) para 53.
[1213] See ss 43-44, 104, and 165(2) of the Constitution.
[1214] See ss 85, 125, and 156(1) of the Constitution.
[1215] See ss 165-180 of the Constitution.
[1216] Schedule 4A of the Constitution.
[1217] Schedule 5A of the Constitution.
[1218] Schedule 4B of the Constitution.

municipalities to adopt and implement an effective system of land use management and enable municipalities to perform their municipal planning functions.[1219]

Local governments have the most significant role in implementing planning law.[1220] Municipal planning is exercised pursuant to the broad objectives set out in national law and policy.[1221] Municipalities, as mentioned above,[1222] have the executive and legislative authority over and the right to administer the matters listed in schedules 4B and 5B, which include municipal planning, any other matters assigned to it by national or provincial government and matters incidental to the performance of their functions. Many other matters included in the Schedules are also relevant to the municipal planning competencies of local government, given that they comprise planning aspects or influence planning decisions.[1223] The municipal planning autonomy afforded to local government has been confirmed in several important cases.

In *City of Johannesburg Metropolitan Municipality v Gauteng Development Tribunal*[1224] the City of Johannesburg (i.e., the municipality) took issue with the Gauteng Development Tribunal[1225] (i.e., an agency of provincial government, established in terms of the DFA) deciding applications for the rezoning of land and the establishment of townships, in terms of the provincial ordinance.[1226] The municipality argued that the GDT usurped the municipality's decision-making authority, failed to take the municipality's planning instruments into account, and hindered their efforts to effectively plan for infrastructure and service delivery within their jurisdiction.[1227] The municipality argued that authority to approve rezoning of

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1219 Sections 10(5) and (6) of SPLUMA.

1220 Urban planning is also referred to as "municipal planning" in literature and legislation. See, for example, Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 129.

1221 Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 129.

1222 See para 3.4 above.

1223 See para 4.2.1 above.

1224 *City of Johannesburg Metropolitan Municipality v Gauteng Development Tribunal* 2010 9 BCLR 859 (CC).

1225 Hereafter GDT.

1226 Section 2 *Town-Planning and Townships Ordinance* 15 of 1986.

1227 *City of Johannesburg Metropolitan Municipality v Gauteng Development Tribunal* 2010 9 BCLR 859 (CC) para 9.

land and township establishment is not part of the functional areas listed in Part A of Schedule 4 of the Constitution, but constitutes a local government competency and falls within the functional area of "municipal planning" in terms of section 156(1), read with Schedule 4B.[1228] The court upheld the municipality's argument and declared the provisions of the DFA invalid, but conditionally suspended the order of validity for a two-year period to allow Parliament to rectify the defects of the Act or to enact new legislation.[1229]

Building on the precedent created by the *City of Johannesburg Metropolitan Municipality v Gauteng Development Tribunal*-case, the court in *Maccsand (Pty) Ltd v City of Cape Town*,[1230] held that the possession of a national mining licence (as acquired by Maccsand) does not preclude the need for municipal town planning approvals. This matter concerned the question of whether the national mining licence obtained by Maccsand removed the need for approval by the City of Cape Town to change the permitted use of the relevant site in Mitchell's Plain. In assessing the merits of the case, the court importantly stated that there is an ostensible overlap between the two functions (mining as a national competence, and regulation of land use being part of "municipal planning") that occurs, because mining is carried out on land.[1231] However, the court stated that the "overlap does not constitute an impermissible intrusion by one sphere into the area of another" because the different spheres do not operate in "hermetically sealed compartments".[1232] The court dismissed Maccsand's argument that the granting of a mining licence trumps municipal authority over "municipal planning" as national

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[1228] *City of Johannesburg Metropolitan Municipality v Gauteng Development Tribunal* 2010 9 BCLR 859 (CC) para 14.

[1229] *City of Johannesburg Metropolitan Municipality v Gauteng Development Tribunal* 2010 9 BCLR 859 (CC) paras 80, 95. See also See also De Visser 2016 *The Ugandan Journal of Management and Public Policy Studies* 91-92.

[1230] *Maccsand (Pty) Ltd v City of Cape Town* 2012 4 SA 181 (CC).

[1231] *Maccsand (Pty) Ltd v City of Cape Town* 2012 4 SA 181 (CC) paras 43.

[1232] *Maccsand (Pty) Ltd v City of Cape Town* 2012 4 SA 181 (CC) paras 43, 47. See also Van Wyk *Planning Law* 17.

government's exclusive authority over mining would not be usurped by the municipality.[1233]

In *Minister of Local Government, Environmental Affairs and Development Planning of the Western Cape v Lagoonbay Lifestyle Estate (Pty) Ltd*[1234] the central question before the court was the issue of who decides land use management applications, such as rezoning and subdivision, with respect to large developments that extend beyond the boundaries of a municipality. The court found in favour of the developer and held that the municipality is best placed to make decisions regarding applications for rezoning and subdivision, regardless of how big the development is and what its effects across municipal boundaries are.[1235]

The notion of municipal autonomy in land use planning was further confirmed in *Habitat Council v Provincial Minister of Local Government, Environmental Affairs and Development Planning, Western Cape*,[1236] which dealt with the power of provincial governments to set aside municipal planning decisions on appeal. The court found that the appeal system was unconstitutional as it intruded on the autonomy of municipalities.[1237]

SPLUMA strengthened this position by establishing that municipalities are responsible for developing IDPs,[1238] SDFs,[1239] and LUS[1240] and zoning schemes that guide development at the local level.[1241] Municipalities further have the legal authority to enact SPLUM by-laws to regulate land use, development applications,

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1233 *Maccsand (Pty) Ltd v City of Cape Town* 2012 4 SA 181 (CC) paras 46. See also De Visser 2016 *The Ugandan Journal of Management and Public Policy Studies* 92.

1234 *Minister of Local Government, Environmental Affairs and Development Planning of the Western Cape v Lagoonbay Lifestyle Estate (Pty) Ltd* 2014 1 SA 521 (CC).

1235 *Cape v Lagoonbay Lifestyle Estate (Pty) Ltd* 2014 1 SA 521 (CC) para 59.

1236 *Habitat Council v Provincial Minister of Local Government, Environmental Affairs and Development Planning, Western Cape* 2013 ZAWCHC 112.

1237 *Habitat Council v Provincial Minister of Local Government, Environmental Affairs and Development Planning, Western Cape* 2013 ZAWCHC 112 para 46.

1238 See s 26 of the MSA.

1239 See ss 12, 20-22 of SPLUMA.

1240 See s 24 of SPLUMA.

1241 See para 4.3 below.

and building standards within their jurisdictions. Accordingly, these by-laws became the primary legislative instrument to regulate planning in municipalities.[1242]

4.2.3 Instrumentation in spatial planning and land use management

It is apt to note that by-laws form part of a slew of spatial planning and land use management instruments that enable municipalities to exercise their legislative and executive authority on planning and provide guidance and regulations for urban development, land use, and environmental protection.[1243] These planning instruments serve as essential tools in achieving the objectives set out in spatial plans and land use management strategies, and they provide municipal authorities with legitimate interventions and ways in which to influence land use.[1244] Planning instruments are created with the intent to facilitate a range of objectives, *inter alia*, to attract and guide private and public infrastructure investment, protect environmental resources and services, discourage inappropriate development, and mitigate environmental and disaster risks within the jurisdiction of a municipality.[1245] The instruments available to authorities are either traditional interventions "relying on a legal basis such as legislative and regulatory 'command-and-control' instruments (like by-laws) and fiscal or economic tools", or are less authoritative such as "agreement and incentive-based instruments, communication and information-based instruments…, as well as *de jure* and *de facto* standards and best practices between private actors."[1246] These instruments consist of, for example, by-laws, policies, development plans and frameworks, and land use schemes. Their usefulness lies in the ability of municipalities to utilise such instruments in the performance of their sectoral functions, to achieve their spatial planning objectives,

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[1242] Van Wyk *Planning Law* 66. See further discussion in para 4.3.4 below. This is also ascribed to the lack of provincial legislation adopted after the enactment of SPLUMA, as only the Western Cape Province had enacted such provincial legislation, in the form of the *Western Cape Land Use Planning Act* 3 of 2014 (LUPA) that allowed municipalities to implement their by-laws. See also De Visser and Poswa 2019 *PELJ* 15.

[1243] See para 3.4 above. See also s 11(3) of the MSA; Hurlimann and March 2012 *WIREs Clim Change* 479-480; De Visser 2016 *The Ugandan Journal of Management and Public Policy Studies* 85.

[1244] Hartmann and Gerber "Land, Scarcity, and Property Rights" 4.

[1245] De Visser and Poswa 2019 *PELJ* 2.

[1246] Gerber, Hengstermann and Viallon "Land Policy: How to Deal with Scarcity of Land" 18-19.

promote sustainable development, and ensure the responsible and equitable use of land and resources, subject to the specific circumstances in their jurisdictions,[1247] and accordingly, to contribute to urban climate resilience.

The type of instrument that a municipality opts to use for exercising its municipal planning mandate depends on a range of different factors and is not a one-size-fits-all approach, as all municipalities do not necessarily have the same challenges and circumstances. The factors determining the selection of appropriate planning instruments include, first and foremost, those legally required by law, and these instruments are not interchangeable, meaning that municipalities are required to have every instrument that the law indicates it *must* have. They can, however, use other instruments as supplementary and complementary to, but not instead of, those legally set out. The other factors include the ease and cost of implementation, the flexibility of the instrument to comply with social norms and be accepted by the community in which it is applied, alignment with the policies and practices of the government in charge and the wider national law and policy framework, and, lastly, the likely success and limited adverse effects of such instrument, based on prior experience.[1248] When considering the first factor, ease and cost of implementation of instruments, municipalities are faced with considerations of financial capacity, human resources, skills and knowledge capacity, and implementation capacity to enable the instrument to be used actively in the context it was designed for.[1249] The second and third factors determine that any instrument should fit in with the social norms and the needs of the community (i.e., be geared toward ensuring and promoting socio-economic rights, fostering sustainable development and economic growth and inclusion, bettering the well-being of the community, and so forth), as well as compliance and alignment with national law and policy, for it to be valid and enforceable.[1250] The last factor determining whether an instrument ought to be used is its desirability, likely adverse impacts, and whether it has successfully been

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[1247] Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 129.

[1248] Gerber, Hengstermann and Viallon "Land Policy: How to Deal with Scarcity of Land" 19-20. See also Linder and Peters 1989 *Journal of Public Policy* 47-48.

[1249] Retief and Cilliers "Municipal Integrated Development Planning" 4-19 – 4-20, 4-27.

[1250] Linder and Peters 1989 *Journal of Public Policy* 47; Hurlimann and March 2012 *WIREs Clim Change* 483.

implemented elsewhere with little to no adverse impact, and whether it can be replicated in the present context (i.e., whether it is the best tool for the job).[1251] However, local authorities should guard against treating planning processes as an exercise in compliance. They should rather use the processes and instruments available to them to guide regulation and investment in their spatial area, to ensure implementation of their spatial plans, and to ensure correlation and linkages between different instruments, to realise their spatial vision.[1252]

It is important to note that municipalities are legally obliged to use certain planning instruments,[1253] and have the discretion to use complementary instruments[1254] to perform their functions in terms of planning and development. Another important point to note is that municipalities will hardly, if ever, use only one type of instrument and will, in most cases (despite the legislative instruction to do so), use a range of instruments.

Traditional planning instruments concern the physical planning of a specific area, and operate through regulating the location, timing and form of development by way of strategies, plans and policies.[1255] Arguably, most of these land-use plans or traditional instruments have a predominant focus on physical aspects of a city and are concerned with providing physical solutions to social or economic problems.[1256] Some of the critique on traditional planning instruments are that it is considered

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1251 Gerber, Hengstermann and Viallon "Land Policy: How to Deal with Scarcity of Land" 19-20. See also Linder and Peters 1989 *Journal of Public Policy* 47-48

1252 Denoon-Stevens *et al* 2022 *Cities* 5-6.

1253 Such as IDPs (see ss 23-27 of the MSA; s 5 of SPLUMA), SDFs (see ss 12, 20-22 of SPLUMA) and LUSs (see ss 24-32 of SPLUMA).

1254 For the enforcement of LUS, this could include by-laws aimed at the enforcement of the LUS (SPLUMA states that a municipality "may pass by-laws aimed at enforcing its land use scheme.") – see s 32 of SPLUMA. Other complementary instruments include, for example, climate change strategies (such as the Tshwane Metropolitan Municipality *Climate Response Strategy* (2018), the City of Cape Town *Climate Change Strategy* (2021), Ekurhuleni Metropolitan Municipality *Climate Change Response Strategy* (2015), and eThekwini Metropolitan Municipality *Durban Climate Change Strategy* (2014)) and plans, such as climate action plans (e.g. City of Johannesburg *Climate Action Plan* (2021), and the eThekwini Metropolitan Municipality *Durban Climate Action Plan* (2019)). See Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management Act, 2013 (SPLUMA)" 259.

1255 See Albrechts 2004 *Environment and Planning B: Planning and Design* 744; Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 130.

1256 Albrechts 2004 *Environment and Planning B: Planning and Design* 745.

rigid and inflexible, is less accommodating of changing circumstances, and that it needs to be complemented by other modes of planning and spatial governance, such as collaborative planning or development management or regulatory instruments which are gleaned from law, for example.[1257] Traditional land use planning is, therefore, often described as reactive, practical and restricted.[1258] Traditional instruments may include, for example, building codes or regulations that specify the technical, operational, and safety standards for buildings and other physical structures in the built environment.[1259]

In addition, traditional planning instruments can also take the form of regulatory instruments, fiscal, or incentive-based instruments. Regulatory instruments comprise restrictions or conditions[1260] to limit what happens on land and can be in the form of restrictive conditions, zoning policies and explicitly scheduled categories of land,[1261] urban growth or service boundaries.[1262] Zoning instruments can be used to encourage higher density development in urban areas to limit urban sprawl, to safeguard the environment by establishing greenbelts, buffer zones, and open green spaces, as well as creating spaces for development, activity, and economic prosperity.[1263] It can further be used to ensure that development takes place where it is planned for, rather than outside of urban and service boundaries, where the necessary infrastructure is lacking. This is where development suspensions or restrictive conditions can play a significant role, as they can prohibit building permits from being issued in a particular area to control the growth rate in an area that lacks sufficient infrastructure, at least until such infrastructure can be provided, or

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1257 Hurlimann and March 2012 *WIREs Clim Change* 484; Albrechts 2004 *Environment and Planning B: Planning and Design* 745; Hartmann and Needham "Introduction: Why Reconsider Planning by Law and Property Rights?" 7.

1258 Albrechts 2004 *Environment and Planning B: Planning and Design* 745.

1259 See Ching and Winkel *Building Codes Illustrated: A Guide to Understanding the 2015 International Building Code* 20; Green Building Codes for Existing and Historic Buildings 5-7; Platt *Land Use and Society: Geography, Law, and Public Policy* 53.

1260 Such as those envisioned in ss 43 and 47 of SPLUMA.

1261 Such as provided for in s 24(2)(a) and Schedule 2 of SPLUMA, prohibiting other land uses on land zoned for a specific purpose.

1262 See Silva and Acheampong *OECD Environment Working Papers No 94* 25.

1263 Section 24(2)(b) also, in this vein, requires an LUS to "take cognisance of any environmental management instrument adopted by the relevant environmental management authority, and must comply with environmental legislation."

development is matched to available infrastructure.[1264] These instruments also encourage brownfield (re-)development.[1265]

Fiscal instruments such as taxes, fees and levies also serve to discourage unplanned and undesirable development and serve to generate public revenue for the relevant authority.[1266] While these instruments can influence the land use and development in the municipality, they are also subject to abuse, as many municipalities struggle with financial capacity to perform their functions and may impose these taxes as a way of increasing their limited revenue. Municipalities can also charge fees for connecting or installing the necessary water, sewage, and energy infrastructure for new developments. There can also be fiscal disincentives, such as fines for non-compliance or committing an offence in terms of legislation.[1267]

Incentive-based planning instruments serve "to stimulate markets and to encourage and attract more desirable activities to locations of strategic interest."[1268] These instruments encourage redevelopment of existing urban areas, as well as conservation, preservation and rehabilitation initiatives to improve the built environment and protect the natural ecosystems and the ecosystem services that they provide.[1269]

Furthermore, SPLUMA, in line with the constitutional imperatives of sustainable development and developmentally oriented local government, the developmental principles,[1270] and the NEMA principles,[1271] promotes environmentally sustainable

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1264 Silva and Acheampong *OECD Environment Working Papers No 94* 27.

1265 Brownfields are described as derelict and underused sites, which might be contaminated, are mainly in urban areas, and require intervention such as redevelopment to revitalise and remediate the site and make it beneficial and attractive for potential investment and further use as it limits the need for new developments on other sites and makes use of existing infrastructure. See World Bank *The Management of Brownfields Redevelopment: A Guidance Note* 1.

1266 See s 74 of the MSA.

1267 See s 58 of SPLUMA.

1268 Silva and Acheampong *OECD Environment Working Papers No 94* 28.

1269 See s 24(2)(e) of the SPLUMA that states that LUS, for example, must "include land use and development incentives to promote the effective implementation of the spatial development framework and other development policies".

1270 See ss 6 and 7 of SPLUMA.

1271 Section 2 of the NEMA.

land use and development practices, and, accordingly, such environmental management instruments should also be considered and integrated into the planning processes and instruments.[1272] Environmental management instruments that have legal effect and must be considered include EIAs,[1273] environmental management frameworks (EMFs), strategic environmental assessments, and (municipal) state of the environment reports (SOERs).[1274]

It is pertinent to note that while more contemporary and strategic planning instruments such as IDPs and SDFs are used to address the issues of rigidity and inflexibility and other shortcomings of traditional planning instruments, the traditional instruments still play an indispensable role in controlling the misuse of land and a combination of these instruments is needed for effective spatial governance and realisation of urban climate resilience.[1275] A comprehensive description of strategic planning is recorded in the *Biodiversity Economy Strategy (BES) for the Department of Environmental Affairs*,[1276] which states:

> Strategic planning starts with an assessment of the status quo, complemented by appropriate medium- and long-term goal setting. Thereafter, the strategic plan determines the transformation enabling interventions required to achieve these goals, and to mobilise the available resources to execute the required actions. A smart strategic plan therefore sets appropriate risk minimising development goals, intermediate objectives, timeframes and roles and responsibilities, all of which can be monitored for progress. But it does this with a view to identify and auction strategic leverage points.

Strategic spatial planning instruments establish long-term visions, objectives, and policies for urban development.[1277] Strategic spatial planning can also assist local

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[1272] See Retief and Cilliers "Municipal Integrated Development Planning" 4-5. See also ss 12(1)(m), 21(j), 24(2)(b), and 25(1)(d) of SPLUMA.

[1273] See s 24 of NEMA; GN R983 in GG 38282 of 4 December 2014, GN R984 in GG 38282 of 4 December 2014; GN R985 in GG 38282 of 4 December 2014. Activities that require basic assessments are listed in reg R983 and R985, while activities triggering a full EIA process are set out in regulation R984.

[1274] Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-61; Retief and Cilliers "Municipal Integrated Development Planning" 4-15.

[1275] See Kunzmann 2013 *disP - The Planning Review* 29; Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 130-134.

[1276] GN 965 in GG 39268 of 9 October 2015.

[1277] Hersperger *et al* 2019 *Cities* 1-3; Albrechts 2004 *Environment and Planning B: Planning and Design* 747; Gordon *Strategic Planning for Local Government* 5.

governments in identifying prevalent and probable challenges in urban areas,[1278] and assists in the design and implementation of strategies and plans that respond to such challenges, to ensure that development objectives are achieved.[1279] These instruments guide the formulation of by-laws and are aimed at ensuring coherence in decision-making across various sectors. Strategic planning consists of agreed-upon arrangements of operations, involving a range of stakeholders, analysis of the needs and opportunities in the spatial area of the municipality, and a defined vision along with the strategies needed to implement the vision and budget allocations.[1280] The development strategy, as envisioned in the context of strategic planning, ought to incorporate the sector plans of the different departments within the municipality. It also serves the short- and long-term planning and development objectives of the municipality, as some of these instruments have a time commitment attached to them, during or after which they must be reviewed.[1281] Strategic planning addresses those aspects or areas that are strategic or important to the overall development objective of the municipality.

4.2.3.1 Integrated Development Plans (IDPs)

In line with the objects of local government set out in section 152 of the Constitution, the developmental duties as required by section 153 of the Constitution, and the mandate to contribute to the progressive realisation of the fundamental rights contained in sections 24, 25, 26, 27 and 29 of the Constitution, and with the notion of cooperative government in mind, municipalities must undertake developmentally-oriented planning.[1282] The MSA requires municipalities to do so through the adoption of a single, inclusive and strategic plan for the

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[1278] Albrechts 2004 *Environment and Planning B: Planning and Design* 747; Retnandari 2022 *Policy & Governance Review* 156; Palermo and Ponzini *Spatial Planning and Urban Development: Urban and Landscape Perspectives* 13-14.

[1279] See Botes *Legal Protection of 'Microclimate Regulation' as an Urban Ecosystem Service in South Africa* 65; Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 231.

[1280] See Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 134-136.

[1281] For example, IDPs and SDFs. See also Albrechts 2004 *Environment and Planning B: Planning and Design* 747.

[1282] Section 23 of the MSA.

development of the municipality, also known as an IDP. The IDP serves to integrate, and co-ordinate plans and takes into account proposals for development, aligns the resources and capacity of the municipality with the implementation of the plan, forms the policy framework and general basis on which annual budgets must be based, and is compatible with national and provincial development plans and planning requirements binding on the municipality in terms of legislation.[1283] IDPs are crucial planning instruments as they reflect the vision for the long-term development of the municipality and highlight the most critical development and internal transformation needs of the municipality.[1284] It is in these instruments that one finds an indication of the existing level of development in the municipality, and an idea of which communities within the municipality do not have access to basic municipal services and need more planning or services.[1285] The IDP sets out the development priorities, objectives, and strategies of the municipality.[1286] The development strategies must be aligned with the sectoral plans and planning requirements established in national and provincial legislation.[1287] In this vein, the IDP must also contain the SDF of the municipality, which includes the provision of basic guidelines for its land use management system.[1288] In addition, the IDP has to contain any applicable disaster management plans, a financial plan (setting out a budget projection for at least three years), and key performance indicators and performance targets.[1289]

Local municipalities have to align their IDPs with the framework of the district municipality and in line with the integrated development processes of the district municipality.[1290]

[1283] Section 25(1) of the MSA. See also Retief and Cilliers "Municipal Integrated Development Planning" 4-3.
[1284] Section 26(a) of the MSA.
[1285] Section 26(b) of the MSA.
[1286] Sections 26(c) and (d) of the MSA.
[1287] See s 26(d) of the MSA.
[1288] See 4.3.3.3 below. See also s 26(e) of the MSA.
[1289] Sections 26(g)-(i) of the MSA.
[1290] Section 29(3) of the MSA.

4.2.3.2 Spatial Development Frameworks (SDFs)

The aim of SDFs is to interpret and represent the spatial development vision of an area, informed by a long-term spatial development vision statement and plan.[1291] They represent the integration and trade-off of all relevant sector policies and plans, and guide planning and development decisions across all sectors of government.[1292] They further guide provincial departments or municipalities in making any decisions or exercising any discretion in terms of SPLUMA or any other law relating to spatial planning and land use management systems.[1293] SDFs serve the purpose of contributing to a coherent, planned approach to spatial development and providing clear and accessible information to the public and private sector, and direction for investment purposes.[1294] Importantly, SDFs should also include previously disadvantaged areas, areas under traditional leadership, rural areas, informal settlements, slums and land holdings of state-owned enterprises and government agencies and address their inclusion and integration into the spatial, economic, social and environmental objectives,[1295] in the realisation of the constitutional imperatives and rights, the development principles of SPLUMA, and the section 2 principles of NEMA.[1296] As such, SDFs should also address historical spatial imbalances in development; identify the long-term risks of particular spatial patterns of growth and development and the policies and strategies necessary to mitigate those risks; take cognisance of any environmental management instrument adopted by the relevant environmental management authority; and give effect to national legislation and policies on mineral resources and sustainable utilisation and protection of agricultural resources.[1297] The SDFs should also provide direction for strategic development, and infrastructure investment, promote efficient, sustainable and planned investments by all sectors and indicate priority areas for investment in land development and, related to that, promote a rational and predictable land

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[1291] Sections 12(1)(a) and (b) of SPLUMA.
[1292] Sections 12(1)(c) and (d) of SPLUMA.
[1293] Section 12(1)(e) of SPLUMA.
[1294] Sections 12(1)(f) and (g) of SPLUMA.
[1295] Section 12 (1)(h) of SPLUMA.
[1296] See s 7 of SPLUMA; s 2 of NEMA, and ss 24-27 of the Constitution.
[1297] Sections 12(1)(i), (j), (m) and (n) of SPLUMA.

development environment to create trust and stimulate investment.[1298] It is of the utmost importance that the SDFs also consider and incorporate the outcomes of substantial public engagement, including direct participation in the process, as the development planning of an area should reflect the needs of the people and community within that area and address their circumstances.[1299] Another important aspect of municipal SDFs is that they must assist in integrating, coordinating, aligning and expressing development policies and plans emanating from the various sectors of the spheres of government, as they apply within the municipal area.[1300]

Municipal SDFs are required to be comprehensive, and the list of aspects that they must cover is quite extensive. They must include a written and spatial representation of a five-year spatial development plan for the spatial form of the municipality, along with a longer-term spatial development vision statement which indicates a desired spatial growth and development pattern for the next 10 to 20 years.[1301] In addition, they must identify current and future significant structuring and restructuring elements of the spatial form, including development corridors, and activity and economic nodes where public and private investment will be prioritised and facilitated.[1302] They need to include population growth estimates for the next five years, estimates of the demand for housing units across different socio-economic categories and the planned location and density of future housing developments, estimates of economic activity and employment trends and locations for the next five years.[1303] They must identify, quantify and provide location requirements of engineering infrastructure and services provision for existing and future development needs for the next five years.[1304] The municipality must include identified designated areas where national or provincial inclusionary housing policies

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[1298] Sections 12(1)(k) and (l) of SPLUMA.
[1299] Section 12(1)(o) of SPLUMA. Such public engagement or participation can occur through public meetings, public exhibitions, public debates and discourses in the media, and any other forum or mechanisms that promote such direct involvement.
[1300] Section 12(5) of SPLUMA.
[1301] Sections 21(b) and (c) of SPLUMA.
[1302] Section 21(d) of SPLUMA.
[1303] Sections 21(e)-(g) of SPLUMA.
[1304] Section 21(h) of SPLUMA.

may be applicable.[1305] SDFs should also include a strategic assessment of the environmental pressures and opportunities, including the spatial location of environmental sensitivities, high-potential agricultural land and coastal access strips, where applicable.[1306] Furthermore, they must designate areas in the municipality where incremental upgrading approaches to development and regulation will be applicable, and designate areas in which more detailed local plans must be developed, shortened land use development procedures may be applicable, and land use schemes may be so amended.[1307] They must also provide the spatial expression of the coordination, alignment and integration of sectoral policies of all municipal departments, and determine a capital expenditure framework for the municipality's development programmes, which must be depicted spatially.[1308] In addition, municipalities have to determine the purpose, desired impact and structure of the land use management scheme to apply in their municipal areas. Their SDF must include implementation plans comprising sectoral requirements, including budgets and resources for implementation; necessary amendments to a land use scheme; specification of institutional arrangements necessary for implementation; specification of implementation targets, including dates and monitoring indicators; and specification, where necessary, of any arrangements for partnerships in the implementation process.[1309] A Municipal Planning Tribunal or any other authority required or mandated to make a land development decision may not make a decision which is inconsistent with a municipal spatial development framework, and may depart from the provisions of such framework only if site-specific circumstances justify a departure.[1310]

[1305] Section 21(i) of SPLUMA.
[1306] Section 21(j) of SPLUMA.
[1307] Sections 21(k) and (l) of SPLUMA.
[1308] Sections 21(m) and (n) of SPLUMA.
[1309] Sections 21(o) and (p) of SPLUMA.
[1310] Section 22 of SPLUMA.

4.2.3.3 Land Use Schemes (LUS)

In terms of SPLUMA, it is compulsory for a municipality to adopt and approve a single LUS for its area of jurisdiction.[1311] The purpose of such a scheme is to determine the appropriate zoning of all land within the jurisdiction of the municipality and set out the regulations for how such land may be used in order to promote economic growth, social inclusion, efficient land development; and minimise impacts on public health, the environment and natural resources.[1312]

Because a LUS determines land uses and such land use planning is so intertwined with the operation of so many sectors within the municipality,[1313] it is necessary that it take cognisance of any environmental management instruments adopted by the relevant environmental management authority, and it must comply with environmental legislation.[1314] A LUS, furthermore, has to include provisions that permit the incremental introduction of land use management and regulation in areas under traditional leadership, rural areas, informal settlements, slums and areas not previously subject to a land use scheme under the previous dispensation.[1315] Because of the government's goals to promote pro-poor development and to address structural poverty in the country, SPLUMA states that a LUS must also include provisions to promote the inclusion of affordable housing in residential land development.[1316] In line with the responsibilities to avoid duplication and ensure alignment with other instruments, a LUS must give effect to municipal spatial development frameworks and integrated development plans.[1317] As such, it has to include land use and development incentives to promote the effective implementation of the spatial development framework and other development policies, and land use and development provisions specifically to promote the

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1311 LUSs are also known as land use management schemes (LUMS) or zoning schemes.
1312 Sections 24(1), 24(2)(a) and 25(1) of SPLUMA.
1313 See para 4.2.1 above.
1314 Section 24(2)(b) of SPLUMA.
1315 Section 24(2)(c) of SPLUMA.
1316 Section 24(2)(d) of SPLUMA.
1317 Section 24(2)(g) of SPLUMA. See also ss 29 and 30 of the SPLUMA that deal with cooperative government, where consultation and alignment of authorisations is necessary.

effective implementation of national and provincial policies.[1318] A LUS may include provisions relating to specific requirements regarding any special zones identified to address the development priorities of the municipality,[1319] and the variation of the conditions of the LUS.[1320] In addition, a LUS must include scheme regulations setting out the procedures and conditions relating to the use and development of land in any zone, a map indicating the zoning of the municipal area into land use zones, and a register of all amendments to the LUS.[1321]

An adopted and approved LUS has the force of law, and all landowners and users of land, including municipalities, state-owned enterprises and organs of state within the municipal area are, therefore, bound by the provisions of such a scheme.[1322] A municipality may pass by-laws aimed at enforcing its LUS.[1323] The LUS replaces all existing schemes within the municipal area to which the land use scheme applies and provides for land use and development rights.[1324] A municipality may, after public consultation, amend its land use scheme if the amendment is in the public interest, to advance a disadvantaged community, and in order to further the vision and development goals of the municipality.[1325] A municipality may also do so by rezoning any land where considered necessary.[1326] A municipality may review its land use scheme in order to achieve consistency with the municipal spatial development framework, and must do so at least every five years,[1327] as the SDF also has a time frame of five years.[1328] A public participation process must be undertaken to ensure that all affected parties have the opportunity to make

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1318 Section 24(2)(e) and (f) of SPLUMA.
1319 Section 24(3)(b) of SPLUMA.
1320 Other than a variation which may materially alter or affect conditions relating to the use, size and scale of buildings and the intensity or density of land use. See s 24(3)(c) of SPLUMA.
1321 Section 25(2) of SPLUMA.
1322 Section 26(1)(a) of SPLUMA.
1323 Section 32(1) of SPLUMA.
1324 Sections 26(1)(b) and (c) of SPLUMA.
1325 Section 26(5) of SPLUMA.
1326 Section 28(1) of SPLUMA.
1327 Section 27(1) of SPLUMA.
1328 See para 4.3.3.1 above.

representations on, object to and appeal decisions taken or intended to be taken to amend an LUS.[1329]

As an LUS has the force of law, it must be enforced and, besides passing by-laws aimed at the enforcement,[1330] a municipality may also apply to a court for an order interdicting any person from using land in contravention of its LUS, or an order authorising the demolition of any structure erected on land in contravention of its LUS, without any obligation on the municipality or the person carrying out the demolition to pay compensation, or an order directing any other appropriate preventative or remedial measure.[1331]

4.2.3.4 Other planning-related instruments

Municipalities' planning duties and mandates go beyond their IDP, SDF, and LUS. There are a number of other instruments relevant to the planning function of local government, such as sector plans, annual budgets and Medium Term Expenditure Frameworks (MTEFs), Service Delivery and Budget Implementation Plans (SDBIPs), and operational plans.[1332] Additionally, municipalities have certain responsibilities in other sectors[1333] that are irrevocably intertwined with their planning functions, and in some instances, these arguably also relate to the features of urban climate resilience, as discussed above.[1334] These responsibilities also relate to the environmental right and its interlinkages with aspects of adequate housing,[1335] access to health and emergency services,[1336] sufficient water and sanitation,[1337]

1329 Section 28(2) of SPLUMA.
1330 See also ss 32(3)-(12) of SPLUMA.
1331 Section 32(2) of SPLUMA.
1332 *Municipal Finance Management Act* 56 of 2003. See also Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-5.
1333 Such as waste management, energy reticulation, environmental protection and conservation, and basic service delivery relating to water and sanitation, to name just a few.
1334 See paras 2.5 and 3.4 above. Municipal planning requires the plans of the municipality to "include the identification of land for housing, education, health services, employment and other social services for all communities equally, with particular attention to disadvantaged areas" - Oakenfull *Urban Planning: A Chronicle and Reflections on Urban Land Use Planning Practice in South Africa* 81.
1335 Section 26 of the Constitution.
1336 Section 27(1)(a) of the Constitution.
1337 Section 27 (1)(b) of the Constitution.

access to electricity[1338] and transport through municipal roads and the adoption of a transit oriented development (TOD) approach in spatial planning, as well as other basic services, and a safe and inclusive natural and built environment.[1339] These responsibilities often necessitate policy instruments or plans to be created and incorporated into the IDP of municipalities. Examples include built environmental performance plans and housing plans or policies, in which municipalities include planning for housing development in their areas, to address the administration of residential and inclusionary housing by way of an integrated human settlement plan.[1340] The *Draft White Paper for Human Settlements* also proposes a responsibility on local government going beyond the regulation of building standards (through the use of building regulations) and regulation of health and safety, to properly plan for human settlements as a whole.[1341]

Municipalities must further, in relation to basic water supply and sanitation, include water services development plans (WSDPs)[1342] as part of their planning responsibilities, and these must be included in their IDPs. To ensure access to electricity, municipalities must integrate details of their reticulation services with their IDP, and offer certain consumer classes free or inexpensive basic reticulation services within the limits of their resources in line with indigent policies to this effect.[1343] As for their transport-related responsibilities, municipalities must include integrated transport plans (ITPs) into their IDPs, which serve to regulate travel

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1338 *Joseph v City of Johannesburg* 2010 4 SA 55 (CC) paras 34-40.

1339 See s 27(1)(c) of the Constitution as well as the rights of the members of a community to equality, human dignity, and life stipulated in ss 9 – 11 of the Constitution. See also Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-24 – 3-26; Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 181.

1340 See s 24(2)(d) of SPLUMA. See also IUDF 66, s 9(1)(a) and 9(1)(f) of the *Housing Act* 107 of 1997; s 21(d) of SPLUMA; s 23(1)(c) of the MSA; and s 5 of the *Social Housing Act* 16 of 2008. See also Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 179.

1341 See *Draft White Paper for Human Settlements* 26.

1342 The WSDP should contain details about the municipal area's physical characteristics (topography, zoning, and situation), current water and sanitation access levels, and the number and locations of residents without access to basic water supplies and sanitation. As such, the WSDP must incorporate, *inter alia*, a five-year plan outlining the causes of insufficient access to basic water supply and sanitation as well as a timeline for when such services should be made available. See ss 11(2)(f) and 13 of the WSA. See also Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 180.

1343 See ss 27(b) and (e) of the *Electricity Regulation Act* 4 of 2006.

demand management in the municipal area. The ITPs must, in the planning of transport routes, improve social infrastructure accessibility for all and regulate and maintain the service level and quality of municipal public transport services.[1344] Moreover, municipalities must also plan for and implement zoning through the LUS to designate public open space areas.[1345] Furthermore, municipalities have the duty and responsibility to use their planning mandates to reduce or limit the environmental impacts that cities have, through, *inter alia*, integrated waste management, air quality management, declaration of protected areas, regulating developments and land use, zoning for conservation uses and restricting development in environmentally sensitive areas. This must include a strategic assessment of the environmental pressures and opportunities in the municipal area by conducting strategic environmental assessments (SEAs) and environmental management frameworks (EMFs).[1346] In respect of climate change, municipalities are expected to undertake climate change needs and response assessments[1347] and adopt climate change response implementation plans (CCRIP) informed by the needs and response assessments.[1348] Municipal planning further requires local governments to ensure efficient, sustainable, resilient and controlled development that prevents or limits urban sprawl and encourages re-densification of low-density

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1344 Social infrastructure includes educational, recreational, health and government facilities.

1345 Public open spaces may include, for example, open spaces, public parks, public gardens, recreation sites, sports fields, or public squares for social and religious gatherings. This is often where most "greening" in cities occurs and is the most obvious form of incorporating urban ecosystem services in cities as it has many benefits – See, for example, Botes *Legal Protection of 'Microclimate Regulation' as an Urban Ecosystem Service in South Africa* 25-37.

1346 See s 21(j) of SPLUMA. The consideration of environmental aspects is also required in terms of s 12(1)(m) of SPLUMA, which requires municipalities to take cognisance of any environmental management instruments. Other environmental management instruments include EIAs, environmental risk assessments, environmental risk management plans, disaster management plans (see s 53(1)(a)-(c) of the *Disaster Management Act*), metropolitan open space systems (MOSS), bio-regional and conservation plans, air quality management plans, integrated waste management plans (s 11(4) of NEMWA), integrated resource plans, and environmental implementation plans developed in terms of section 11(1) of the NEMA. See also Laubscher *et al SPLUMA: A Practical Guide* 9-11; Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-5.

1347 In terms of s 17(1)(a) of the *Climate Change Act* 22 of 2024.

1348 Section 17(1)(d) of the Climate Change Act.

areas, redevelopment of brownfield sites, and retrofitting existing areas and public infrastructure to promote mixed-use and multi-functional urban spaces.[1349]

4.2.4 By-laws in spatial planning and land use management

By-laws are binding local legislation passed by the council of a municipality.[1350] By-laws, although not exclusively a planning instrument, are valuable command-and-control instruments that may be used by municipalities to promote the planning objectives and development goals set out in their other planning instruments.[1351] The place of local-level legislation is not new, and McBain[1352] went so far as to say that "a city deprived of this time-exercised power of local legislation would be very nearly inconceivable as an operating unit of government." He also suggests that local legislative powers are vested in the corporate authorities of municipalities, and that it is important that "the voice of the locality should be heard on the question of their incorporation and other matters affecting them."[1353] Even in some foreign jurisdictions,[1354] local-level legislation (i.e. by-laws or subnational legislation) is acknowledged as a crucial instrument for land use management and planning. In the United States of America (US), for example, subnational legislation at the local level is also referred to as "house rule"[1355] which affords local government with

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[1349] Sections 3(d) and 25(1)(A)(c) of SPLUMA; IUDF 37, 48, 76. See also Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 182.

[1350] See s 1 of the MSA. See also para 3.4 above.

[1351] See Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-34; Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 238.

[1352] McBain 1917 *Political Science Quarterly* 278.

[1353] McBain characterised these legislative powers as pertaining to enactment of "police laws, financial laws, laws related to the use of streets and other public spaces, ordinances that may be generically described as administrative, and could also reference proposed bond issues, tax levies, or franchise grants as these are subjects in respect of which power may be and commonly is delegated to the corporate authorities of cities." McBain 1917 *Political Science Quarterly* 285.

[1354] The examples here are not intended to provide comprehensive detail about local-level legislation in foreign jurisdictions, nor does it represent an exhaustive list of countries where local-level legislation is deemed crucial for land use and planning, but rather serve as examples for contextual purposes to show the relevance and role of local-level legislation in other parts of the world and not just in South Africa. For more examples of local-level influence on urban planning, see UN-Habitat *A comparative analysis of urban governance for planning in 10 countries of the global South* 8-9.

[1355] See Schroeder and Bulkeley 2009 *Fordham Urban Law Journal* 319. They define "house rule" as a guarantee of non-interference in certain areas of local affairs.

> substantial control over local land use decisions through zoning and varied planning tools, strategies for promoting economic development and diversification and even direct oversight of core governmental functions.[1356]

Further to this, the local government and local legislature in the US differ from the federal model followed by its federal (national) government and state (provincial) governments. Nevertheless, local governments have "enormous power within its sphere of influence",[1357] especially insofar as it involves land use controls and zoning that influence their communities and property values, for example. The local legislature in the context of the US is described as "designed for efficiency and instrumentalism, not participation"[1358] and, accordingly, it is argued that courts ought to allow for greater leeway in terms of experimentalism and policy innovation, except for matters where exclusionary and expropriative action is involved.[1359] Local governments are, in the US, also considered mere political divisions of the state governments and are meant to exercise parts of the state government's powers that are expressly granted to them, and can be withdrawn or amended by the states at any time.[1360] They also serve the purpose of implementing state laws.

In the UK, as another example, local governments are considered to have partial autonomy and are allowed to pursue activities they consider will promote the economic, social, or environmental well-being of their areas. Schroeder and Bulkeley[1361] argue that this gives local governments in the UK "considerable scope to implement climate policy" and "develop statutory strategies on transport, housing, spatial planning, economic development, and the environment."[1362] They also identify "control and compliance" as one of four modes of governing climate change.[1363] Under control and compliance, they postulate that municipalities,

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1356 Mazmanian and Kraft *Towards Sustainable Communities: Transitions and Transformations in Environmental Policy* 204.
1357 Kazis 2018 *Hastings Law Journal* 1155.
1358 Kazis 2018 *Hastings Law Journal* 1156.
1359 See Kazis 2018 *Hastings Law Journal* 1156.
1360 See Schroeder and Bulkeley 2009 *Fordham Urban Law Journal* 319.
1361 Schroeder and Bulkeley 2009 *Fordham Urban Law Journal* 319.
1362 Schroeder and Bulkeley 2009 *Fordham Urban Law Journal* 334.
1363 The other three modes of governing climate change are self-governing (the capacity of a municipality to shape its own activities), governing by provision (emission reductions through delivery of particular forms of services and resources), and enabling (facilitation, coordination,

although not through direct use of legal instruments to govern climate change, use their powers to steer planning law in terms of emission standards, energy efficiency in new developments within the enabling legal framework, and multi-level governance model.[1364]

In South Africa, the MSA and SPLUMA make provision for municipalities to exercise executive and legislative authority, in relation to their planning competencies, by including the development and adoption of policies, plans, strategies and programmes, mandating development, and importantly adopting and implementing by-laws to that effect.[1365] The MSA goes further in setting out the procedures to be followed for the introduction, adoption and implementation of by-laws, such as by whom, how and to what effect.[1366] Thanks to the enactment of SPLUMA and the courts' emphasis on local government's planning responsibilities in South Africa,[1367] municipalities have the authority to design and adopt municipal planning by-laws.[1368] This is also apparent from Schedules 4B and 5B of the Constitution, which "operates to define areas of municipal legislative competence through the combined operation of sections 156(1)(a) and (2)" of the Constitution.[1369] The delays in implementing the SPLUMA and uncertainty regarding the validity and sustained application of the ordinances resulted in a lack of provincial legislation to guide municipalities in the creation of their spatial planning by-laws, and only the Western Cape Provincial Government enacted the LUPA,[1370] allowing municipal by-law drafting. Local governments were thrust into responsibility after the enactment of SPLUMA, as they had to develop and adopt SPLUM by-laws without provincial acts and ordinances

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and encouragement of action through partnerships and engagement). See Schroeder and Bulkeley 2009 *Fordham Urban Law Journal* 335.

1364 Schroeder and Bulkeley 2009 *Fordham Urban Law Journal* 335.

1365 Sections 11(3)(a), (b), (c) and (m) of the MSA; s 32 of SPLUMA. See also para 3.4 above.

1366 See the detailed guidelines in ss 12-14 of the MSA. See also para 3.4 above.

1367 See case discussion in para 4.2.2 above.

1368 Section 32(1) of SPLUMA; s 156(2) of the Constitution. See also De Visser 2016 *The Ugandan Journal of Management and Public Policy Studies* 96; Viviers, Retief and Cilliers "Land-use Management and Planning" 16-2.

1369 See *Govan Mbeki Local Municipality v Glencore Operations South Africa (Pty) Ltd; Emalahleni Local Municipality v Glencore Operations South Africa (Pty) Ltd* 2024 ZACC 25 (Glencore-case) para 180.

1370 See para 4.2.2 above.

acting as intermediary legislation, regardless of their limited capacities.[1371] Each municipality could develop and adopt a by-law setting out the desired procedures and requirements for land use management within its jurisdiction, which was a point of great concern for developers as the system under the provincial ordinances reflected provincial uniformity, which would be lost under the new mandate of local government to create their own planning laws.[1372] Another aspect that makes by-laws useful tools is that they govern the day-to-day activities affecting urban climate resilience, planning, and urban development, such as waste management, building design, air pollution management, and zoning, among others; while IDPs and SDFs are long-term strategic tools with similar effect, as alluded to above.[1373]

To resolve and address capacity challenges, the MSA specifically included a provision to the effect that standard draft by-laws may be drafted concerning any matter for which municipal councils may make by-laws, including their planning functions.[1374] This posits that, at the request of a representative from organised local government, a standard draft by-law can be drafted recommending the design and content to be included in a spatial planning and land use management by-law.[1375] These draft by-laws are introduced as a guideline and "blueprint" for municipalities to use and adapt or amend to their own circumstances. There is evidence of such draft by-laws existing, and it was mentioned in passing by a few participants during the interviews conducted as part of the empirical research portion in Chapter five below.[1376]

[1371] See Van Wyk *Planning Law* 61.

[1372] De Visser and Poswa 2019 *PELJ* 10.

[1373] See paras 4.2.3.1 and 4.2.3.2 above.

[1374] See s 14 of the MSA. The law uses "draft" by-laws and "standard" by-law interchangeably.

[1375] See Department of Rural Development and Land Reform *Spatial Planning and Land Use Management Guideline By-Law on Municipal Land Use Planning.*

[1376] These by-laws are difficult to come by, and the versions found are not formal or final drafts that municipalities worked from, and it is also not clear whether all municipalities (even the three municipalities investigated under Chapter five as part of the empirical portion of the study) used such blueprint draft/standard by-laws in the development of their own spatial planning and land-use management by-laws. See Department of Rural Development and Land Reform *Spatial Planning and Land Use Management Guideline By-Law on Municipal Land Use Planning*; GOGTA Mpumalanga Provincial Government *The Spatial Planning and Land Use Management By-law*. These are the only two instances of standard draft or blueprint by-laws found. The first, apparently based on the work of the Department of Rural Development and Land Reform, could not be found in their extensive resource catalogue on their website. The second was also found on a website that appeared to belong to COGTA of the Mpumalanga Provincial Government, but

Relative to the other planning instruments, such as the IDP and SDF, by-laws have a particular place in the municipal planning functions and mandates of local government. SPLUM by-laws can serve three interconnected roles, namely a regulatory role, an institutional role, and a guiding role. These roles are discussed in the following part of this chapter, also as it relates to enhancing urban climate resilience. Given the perceived interconnectedness between urban climate resilience and the planning competence of local government and the fact that such resilience is not generally included in the planning discourse as part and parcel of planning law, it is asserted that in these roles of SPLUM by-laws and its prescribed content in terms of the legal framework, there is arguably also place for innovation and discretion to include such aspects.

4.3 The regulatory role of SPLUM by-laws in enhancing urban climate resilience

SPLUM by-laws are tools that municipalities, as governing entities,[1377] can use to control, govern and regulate land use, development, management and other activities by natural and legal persons in their jurisdiction.[1378] They are considered to be legal mechanisms for the implementation and enforcement of municipal SDFs, IDPs, and LUSs. In other words, by-laws such as these are legally enforceable and require compliance,[1379] whereas IDPs and SDFs are policy-type documents that offer strategic guidance. As such, by-laws can, and often do, impose fines or penalties for transgressions and non-compliance and in many cases contain provisions relating to offences.[1380] Because of this, by-laws are more powerful instruments for implementing regulations and plans.

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it is not a final version as it contains edit markers. The municipalities in Chapter three also could not provide the researcher with a copy of such by-law. See also para 5.4.4 below.

1377 The governing function of municipalities is effectuated through legislative measures (such as by-laws) or "measures adopted by the municipal executive" (such as local policies, local-level strategic guidelines, etc.) - Nel, Du Plessis and Retief "Key Elements for Municipal Action" 2-6 – 2-7.

1378 Nel, Du Plessis and Retief "Key Elements for Municipal Action" 2-6.

1379 See s 1 of the MSA. See also para 3.4 above.

1380 See, for example s 84-85 of the eThekwini Metropolitan Municipality *Planning and Land Use Management By-law* (2016); s 85-93 of the Knysna Municipality *Spatial Planning and Land Use Management By-law* (2021); s 100-107 of the Nelson Mandela Bay Municipality *Spatial Planning*

The enforceability of by-laws is crucial in the planning sphere for implementing the LUS[1381] and regulating land use, building standards, zoning,[1382] and even environmental protection[1383] to ensure the outcome of sustainable and resilient urban spaces.[1384] Through regulating these aspects and ensuring the implementation of the other instruments, these by-laws also ensure that proposed land uses align with the broader planning policies and vision of the municipality in terms of directing prioritisation of urban growth and applicable development areas, protecting sensitive ecosystems, and avoiding land use conflicts. They also strive to limit unplanned hazardous development in unsustainable and dangerous zones not earmarked for development, and which may lack sufficient infrastructure needed for service delivery.

SPLUM by-laws are also considered to have a measure of adaptability in the context of urban governance.[1385] As mentioned above,[1386] IDPs and SDFs are strategic planning instruments that set out the broad visions and strategies for municipal planning and development; however, they do not directly translate plans into actionable and enforceable measures. This is arguably where by-laws come in and operationalise the plans and strategies by codifying specific rules and standards.[1387]

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and Land Use Management By-law (2023); s 107-112 of the Msunduzi Local Municipality *Spatial Planning and Land Use Management By-law* (2020); s 11 of the Ekurhuleni Metropolitan Municipality *Spatial Planning and Land Use Management By-law* (2019); s 45-49 of

1381 See UN-Habitat *Benchmarking Case Studies on Planning Laws in Five Countries* 120.

1382 In terms of zoning and building regulations, for example, by-laws can be used to establish zoning categories and relevant land uses that align with the development plans and frameworks of the municipality. It can also determine norms and standards for building materials, heights, densities, and other restrictions in terms of energy-efficient practices, and so forth. It aims to ensure that municipal land is used in a way that is compatible with the municipality's development objectives and environmental sustainability.

1383 The court in the Le Sueur-case determined that local government has the competence and authority to regulate environmental matters such as the protection of the environment and that eThekwini Metropolitan Municipality's use, in this case, of its spatial planning instruments did not transgress or usurp the constitutional or other environmental powers of national and provincial government - *RA Le Sueur v eThekwini Municipality* 2013 JDR 0178 (KZP) (Le Sueur-case) para 40. See also Du Plessis 2015 *PELJ* 1860.

1384 See, for example, Schedule 4B and 5B of the Constitution; Nel, Du Plessis and Retief "Key Elements for Municipal Action" 2-7.

1385 It is important to note, however, that by-laws are designed to align municipal actions with national and provincial legislation, and consequently, by-laws may not be contrary to or transgress national and provincial legislation, as this will render them invalid.

1386 See paras 4.2.3.1 to 4.2.3.3 above.

1387 See UN-Habitat *Planning Law Assessment Framework* 8, 12-14.

Further, by-laws create clear, actionable rules that municipalities and communities must follow as they promote accountability in urban governance and ensure effective implementation of plans.[1388] These by-laws also provide specificity to general provisions in national and provincial laws and policies, and other planning instruments.

Although land use schemes also have regulatory authority,[1389] by-laws are used to complement and enhance these schemes by addressing broader or more specific governance issues, such as certain requirements, regulations, and norms and standards.[1390] It stands to reason that municipalities can use by-laws to give effect to any of their main planning instruments or the sectoral planning instruments (for instance, enforcing provisions contained in the integrated waste management plans,[1391] biodiversity management or bioregional plans,[1392] air quality management

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[1388] See UN-Habitat *Rules of the Game – Urban Legislation* 16; Raniero *Subnational Climate Policies in Brazil's Legal Amazon at a Glance* 5.

[1389] See para 4.2.3.3 above.

[1390] Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management, 2013" 262.

[1391] See, for example, Saldanha Bay Municipality *Integrated Waste Management Plan* (2022); Stellenbosch Municipality *Final 4th Generation Integrated Waste Management Plan 2024 – 2029* (2024); City of Cape Town *3rd Generation Integrated Waste Management Plan* (2017).

[1392] See, for example, Maruleng Local Municipality *Biodiversity Sector Plan Handbook* (2019); City of Cape Town *Biodiversity Management Progress Report* (2023); City of Tshwane *Bioregional Plan for the City of Tshwane* (2016); CapeNature *Western Cape Biodiversity Spatial Plan Handbook* (2017); City of Cape Town *Local Biodiversity Strategy and Action Plan* (2019); Clean Stream Biological Services *Baseline Biodiversity Management Plan De Berg Private Nature Reserve* (2022).

plans,[1393] comprehensive infrastructure plans,[1394] comprehensive transport plans,[1395] and water services development plans).[1396]

However, it is important to note at this juncture that despite the usefulness and crucial role of by-laws in spatial planning and land use management and concomitant issues such as climate change and urban climate resilience, they cannot address these issues by themselves and should not be expected to do so.[1397] They should, therefore, arguably be used as complementary and "serve as an additional layer of regulation in regulating land use".[1398]

SPLUMA does not provide a distinctive list of contents required in municipal SPLUM by-laws, but indicates to the broad competence that municipalities have to make and administer such by-laws.[1399] However, it is postulated that municipalities do not have absolute discretion in terms of the content of their municipal planning by-laws,

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[1393] See City of Cape Town *Air Quality Management Plan 2024 2nd Generation Plan* (2024); Garden Route District Municipality *Air Quality Management Plan* (2019); Cape Winelands District Municipal *Air Quality Management Plan* (2018); Buffalo City Metropolitan Municipality *Air Quality Management Plan Draft* (2018); Overstrand Municipality *Air Quality Management Plan* (2017); West Coast District Municipality *2nd Generation Air Quality Management Plan* (2019); ZF Mgcawu District Municipality *Air Quality Management Plan Second Generation* (2024).

[1394] Many of these comprehensive infrastructure plans are done as part of the IDP process in municipalities or are still to be done by many municipalities. See, for example, Prince Albert Local Municipality *5th Generation Integrated Development Plan 2022-2027 (2023/2024 review)* (2024) 266-267; Makana Municipality *Integrated Development Plan Revision IV Draft 2016-2017* (2016) 112-113, 259; Cederberg Municipality *Final Integrated Development Plan 2024/2025* (2024) 102-103; Ulundi Local Municipality *Final Integrated Development Plan 2024/2025* 14, 15, 116; George Municipality *Amended Integrated Development Plan 2022-2027* (2023) 139.

[1395] See City of Cape Town *Comprehensive Integrated Transport Plan 2023-2028* (2023); Nelson Mandela Bay Municipality *Comprehensive Integrated Transport Plan: 2023 / 2028* (2023); John Taolo Gaetsewe District Municipality *District Integrated Transport Plan 2023/2024 Draft* (2023); eThekwini Municipality *Comprehensive Integrated Transport Plan 2024-2029* (2024); Stellenbosch Municipality *Comprehensive Integrated Transport Plan 2016-2020* (2016); Mangaung Metro Municipality *Comprehensive Integrated Transport Plan* (2023); Rustenburg Local Municipality *Comprehensive Integrated Transport Plan 2017-2022* (2017).

[1396] City of Cape Town *Water Services Development Plan - IDP Water Sector Input Report 2017/18-2021/22* (2017); Stellenbosch Local Municipality *Water Services Development Plan* (2018); Breede Valley Local Municipality *Water Services Development Plan 2023 – 2028* (2023); Joe Gqabi District Municipality *2022/23 – 2026/2027 Water Services Development Plan* (2023); George Municipality *Water Services Development Plan – IDP Water Sector Input Report* (2020); Nelson Mandela Bay Municipality *Water Services Development Plan* (2018).

[1397] See Jörgensen, Jogesh and Mishra 2015 *Journal of Integrative Environmental Sciences* 235.

[1398] See Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 209.

[1399] See Denoon-Stevens *et al* 2022 *Cities* 4; Viviers, Retief and Cilliers "Land-use Management and Planning" 16-2.

as they must be consistent with the Constitution, uphold and realise the fundamental rights in the Bill of Rights, and may not conflict with a national or provincial law.[1400] If it does conflict with a national or provincial law, a by-law is considered invalid.[1401] Furthermore, there is considerable guidance inherent in SPLUMA. For example, De Visser and Poswa,[1402] postulate that some of the prescribed contents can be identified by considering four challenges that SPLUMA was meant to address, namely delineation of roles and responsibilities, especially concerning municipal and provincial government; the interrelationships between plans and rights; management and inclusion of informality and unplanned development; and, lastly, government coherence.[1403] Based on these challenges and the contents of the case studies they conducted, the authors surmised that SPLUM by-laws should comprise:[1404] a) definitions of important terms; b) insight on how the relationship between municipal by-laws and provincial legislation will be dealt with;[1405] c) a link between municipal spatial planning and land use management, in other words, how the SDF, IDP and LUS are addressed in the MPT's criteria for decision-making;[1406] d) provisions for the incremental introduction of land use management and regulation in areas under traditional leadership, rural areas, informal settlements and areas not previously subject to a LUS, or e) any provisions differentiating between such areas and formally planned areas,[1407] as well as f) decision-making criteria in this vein; g) public participation methods; h) information

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1400 De Visser and Poswa 2019 *PELJ* 10.

1401 Section 156(3) of the Constitution.

1402 De Visser and Poswa 2019 *PELJ* 2-28. They considered the four challenges and the SPLUM by-laws of 15 municipalities across the nine provinces.

1403 De Visser and Poswa 2019 *PELJ* 3.

1404 This list of contents is compiled based on the discussion and findings of De Visser and Poswa 2019 *PELJ* 15-23.

1405 This links back to the systems and institutions envisioned in Chapter two (see para 2.2.4 above) and the actionable feature of "coordinated government" in which there are good governance practices, and it provides for accountability, responsibility, sound policies and a good cooperative relationship with other spheres of government and organs of state. See para 2.5.6 above.

1406 Incidentally, the composition and powers of the MPT are also part of the institutional role discussed below – see para 4.4 below.

1407 d), e), and j) arguably relate to features under the economic and social sphere and directly deal with the features regarding "sustainable livelihoods", "adequate basic services" , and inclusivity and "nature-based urban development" that ensures environmentally safe and "suitable built environments" in urban spaces and human settlements. See paras 2.5.1, 2.5.2, 2.5.4 and 2.5.5 above.

and procedures needed to launch an application for tenure or development on communal land;[1408] i) criteria for approval, fees, notice costs and enforcement measures; j) provisions aimed at expanding formal planning systems into unplanned areas; k) administrative arrangements in terms of decision-making on applications, including time-frames and consequences for undue delays in decision-making; l) procedures to be followed for the shortened land development procedures as envisioned in section 21(1)(ii) of SPLUMA; m) proliferation and alignment or integration of authorisation procedures where different organs of state are involved in different aspects of authorisations; and n) relevant appeal procedures. Arguably, the prescribed contents included from i) to n) are more suited to the institutional role[1409] of SPLUM by-laws. These are subsequently described in the following part of the chapter. Section 6 of SPLUMA also provides that the development principles must guide the adoption and implementation of any by-law regulating the use or development of land.[1410] This means that the by-laws must take cognisance of the principles of spatial justice, spatial sustainability, efficiency, spatial resilience, and good administration.[1411]

Municipal planning by-laws may further determine norms and standards with which existing and new authorised activities and developments in the municipality must comply.[1412] By-laws are included in many of the sector-specific acts as part of the matters in respect of which local government has executive and legislative authority.[1413] This arguably extends to municipal planning functions and sectoral functions related thereto. Similarly, through the incorporation of climate vulnerability assessments (or climate change needs assessments) as required by the Climate Change Act,[1414] into their by-laws, municipalities stand to identify and protect vulnerable areas from development, such as floodplains and coastal zones

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[1408] G) and h) speak directly to the feature of "inclusive community structures and processes". See para 2.5.3 above.
[1409] See para 4.4 below.
[1410] Section 6(1)(a) of SPLUMA.
[1411] See s 7 of SPLUMA.
[1412] See, for example, s 46(4)(b) of the NEMA.
[1413] See, for example, Section 11(1) of the NEMAQA; Sections 49(c) and 40(1)(b)(iv) of the NEMPAA, amongst others.
[1414] Section 17 of the Climate Change Act.

prone to storm surges, and consequently reduce exposure to climate hazards and prevent costly damages in the long run.

4.4 The institutional role of SPLUM by-laws in enhancing urban climate resilience

The institutional role of SPLUM by-laws is vested in the fact that local governments are responsible for governing their own processes and activities. In other words, this "governance"-based role of SPLUM by-laws refers to the internal processes of "controlling, regulating, and verifying the activities of municipal office bearers against the principles of good governance - efficiency, transparency, and accountability".[1415]

The institutional role also entails the appropriate mechanisms for municipalities' relationships with local communities and decision-making that affects them. This inherently involves the administrative rights and processes envisaged by the Constitution and the *Promotion of Administrative Justice Act*[1416] and the *Promotion of Access to Information Act*.[1417] The institutional role, therefore, requires the establishment and governance of the relevant IDPs, SDFs, structure, and relevant processes through which land use and development are managed and regulated.[1418]

There are provisions in SPLUMA that provide a framework outlining how municipalities must exercise their municipal planning powers.[1419] Spatial planning and land use management or municipal planning by-laws can arguably regulate aspects of the application procedures, zoning categories, public participation on

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[1415] Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-23. For more information on the principles of good governance, see also King Report on Governance for South Africa (2009); King Code on Governance Principles (King III) para 4. See also paras 2.3.4 and 2.4.5 above.

[1416] 3 of 2000 (PAJA).

[1417] 2 of 2000 (PAIA).

[1418] Nel, Du Plessis and Du Plessis "Instruments for Local Environmental Governance" 3-24 – 3-32; UN-Habitat *Planning Law Assessment Framework* 9; Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management, 2013" 264-268.

[1419] Sections 5(1), 19 and 22-23 of SPLUMA. See also De Visser and Poswa 2019 *PELJ* 11; Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management, 2013" 147.

development applications, timeframes for applications, appeal procedures, conflict resolution, and enforcement.[1420] Enforcement provisions in by-laws pertain to the contravention of or failure to comply with municipal by-laws, which may result in the launching of criminal proceedings, punishable by imprisonment or the imposition of a fine.[1421] Furthermore, it is argued that these planning by-laws can also be used to provide for the inclusion and participation of traditional authorities in development decisions, where applicable.[1422]

Furthermore, SPLUM by-laws set out the composition, roles, and responsibilities of structures or planning authorities such as the MPTs or Appeal Authorities.[1423] To ensure compliance with decisions of these authorities and any restrictions on conditions[1424] they may impose, the by-laws also include monitoring or enforcement mechanisms[1425] and other measures and processes through which municipalities may inspect, enforce, and impose fines, penalties, or, in extreme cases, imprisonment for non-compliance. These by-laws may also stipulate any dispute resolution and conflict management procedures within their institutional framework to govern their interdepartmental and intergovernmental, as well as community grievances and stakeholder conflicts and disputes, before approaching the courts to resolve them.

As mentioned above,[1426] some of the prescribed content identified by De Visser and Poswa is more suited to the institutional role of these by-laws. The relevant contents contained in the previous section of this chapter that relate to the institutional role of SPLUM by-laws, comprise, *inter alia*, the criteria for approval of applications,[1427] related fees, notice costs and enforcement measures, and other administrative

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1420 See ss 42-44 of SPLUMA; De Visser 2016 *The Ugandan Journal of Management and Public Policy Studies* 96.

1421 Section 112(a) of the MSA. See also item 5 of Schedule 3 of the MSA.

1422 Poswa *Implementing the Spatial Planning and Land Use Management Act of 2013: An Examination of the Intersection of the Role of Traditional Leaders and Municipalities in Spatial Planning and Land Use Management* 214-215.

1423 See ss 35-48 on the MPT and s 51 relating to appeals. UN-Habitat *Planning Law Assessment Framework* 10-11.

1424 See s 47 of SPLUMA on restrictive conditions.

1425 See ss 27 and 32 of SPLUMA.

1426 See para 4.3 above.

1427 See ss 42 and 43 of SPLUMA.

arrangements necessary for decision-making on applications, applicable timeframes and consequences for undue delay that may affect the administrative rights of applicants.[1428] Moreover, these by-laws stipulate the submission, review, and approval of development applications, rezoning applications, and applications pertaining to subdivision of land. They set out these requirements, relevant timeframes and fees[1429] to ensure consistency, efficiency, and procedural fairness in application processes, and to establish a standardised approach for land use management and development in the jurisdictional area of the municipality. In line with the requirement for procedural fairness and the goal of transparency and accountability, these by-laws also provide mechanisms for public participation in the planning decisions of municipalities to ensure that these decisions reflect the community needs and circumstances of the municipality.[1430] The institutional role supports the features of inclusive community structures and processes and cooperative governance.

4.5 The guiding role of SPLUM by-laws in enhancing urban climate resilience

SPLUM by-laws enable municipalities to translate national and provincial policies into local action and ensure the alignment between the development and planning vision and priorities of all three spheres of government. They also allow for the integration of national and provincial policies into the planning practices of local government. Further, also to the point on actionable features under the regulatory role described above,[1431] by-laws arguably also hold potential to incorporate the actionable features of urban climate resilience.[1432] SPLUM by-laws guide municipalities in balancing development needs with environmental and socio-economic considerations and providing comprehensive requirements for zoning and building regulations (within

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[1428] See ss 44, 46 and 47 of SPLUMA.

[1429] For a comprehensive discussion on the fiscal autonomy of municipalities in South Africa, see *City of Johannesburg Metropolitan Municipality v Zibi* 2021 ZASCA 97.

[1430] UN-Habitat *Planning Law Assessment Framework* 8-10.

[1431] See para 4.3 above.

[1432] See UN-Habitat *Rules of the Game – Urban Legislation* 16.

the mandate of local government),[1433] as well as land use management by implementing measures that mitigate risks, arguably including climate risks, in the scope of municipal planning.[1434]

The adaptability of these by-laws as envisioned above[1435] can arguably make them more responsive to the multitude of risks and vulnerabilities accompanying climate change and its effects on urban environments.[1436] By-laws can be tailored to provide regulatory measures pertaining to the specific localities, circumstances and capacities of different municipalities and can be adapted to allow a wide range of differentiation between the different types of municipalities (metro, district, or local), capacities that go with that distinction, and location of municipalities (coastal or inland, urban or rural). It also refers to the ability of by-laws to be adapted and amended from time to time to allow for changes in circumstances and to keep up to date with modern infrastructure and technologies that can be employed for enhancing urban climate resilience. If SPLUM by-laws can cater for such differentiation, they can arguably also guide municipalities on the incorporation of a range of challenges they might face and possible responses to such challenges, insofar as they relate to municipal planning.[1437] This is indicative of the authority of local governments to create zoning schemes and land use regulations that reflect the unique needs and characteristics of their jurisdictions, which is inherently a discretionary power and allows municipalities to incorporate and address aspects relating to the specific socio-economic and environmental challenges prevalent in their areas of jurisdiction.[1438]

SPLUMA also vaguely states that a municipality may pass a by-law aimed at the enforcement of its LUS, but does not specify what must be contained in such a by-

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[1433] See Schedule 4B of the SPLUMA.

[1434] See, for example the arguments posited by Van der Bank *The Role Of Building Regulations in Sustainable Local Governance* 47-48.

[1435] See para 4.4 above.

[1436] Hurlimann and March 2012 *Wires Climate Change* 479-480; UN-Habitat *Planning Law Assessment Framework* 7-8.

[1437] See s 11 of SPLUMA on municipal differentiation and the basis on which such differentiation may be determined.

[1438] See generally Nel, Du Plessis and Retief "Key Elements for Municipal Action" 2-6 – 2-13.

law.[1439] The MSA also fleetingly provides that a municipality may develop and administer by-laws promoting and undertaking development, promoting a safe and healthy environment, and may do so for all matters falling within its executive and legislative functions.[1440] Van Wyk and Oranje observe that while SPLUMA provides for a land use management system (LUMS) tied to the SDF and ostensibly supporting and providing "transformative spatial development guidance" concerning the introduction and operation of LUMS, its "inclusion of climate change is negligible".[1441] These authors argue that SPLUMA only provides a directive principle that states:

> Policy, administrative practice and laws should 'promote efficient and integrated land development in that they encourage environmentally sustainable land development practices and processes' at the required scale to promote the establishment of viable communities and the sustained protection of the environment.[1442]

From this, it is argued that SPLUMA is considered to be the framework legislation for municipal planning and as such, it is up to municipalities to determine the detail they want to include in their by-laws.[1443] Municipal planning can arguably also encompass aspects related to climate change, as the Climate Change Act also arguably neglects the role of municipalities in addressing climate change challenges beyond the required CCNRA and CCRIP, which connects it to the municipal planning competence of local government.[1444] The Climate Change Act is also silent on the role of local municipalities and only requires such assessment and implementation

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1439 Section 32(1) of SPLUMA.

1440 See ss 11(3)(b), (l) and (m) of the MSA.

1441 See Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management, 2013" 263.

1442 See Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management, 2013" 263-264.

1443 Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management, 2013" 61.

1444 This is also discernible from s 17(1)(b) of the Climate Change Act, which holds that an MEC and mayor…must assess the extent to which its constitutionally mandated functions are affected by climate change and formulate steps to address these effects in the performance of its functions" and further the provision in s 17(2)(c) that "the climate change needs and response assessment must *identify and spatially map*, within the sphere of operations of the province, district or metropolitan municipality, as the case may be, *risks, vulnerabilities, areas, ecosystems and communities that will arise, or that are vulnerable to the impacts of climate change*".

plan from metropolitan and district municipalities.[1445] Further also to the point made above[1446] that municipalities do not have absolute discretion but must at a minimum be consistent with the Constitution, uphold and realise the fundamental rights in the Bill of Rights, and not be contrary to national or provincial legislation, there is considerable room for innovation, experimentalism and municipal discretion, as these "limitations" are not extremely restrictive.[1447] Despite the contents listed in the present and preceding sections of the study, there is still room and freedom for innovation for local government to use their legislative competence in terms of municipal planning.[1448]

SPLUM by-laws arguably have the potential to be used creatively and experimentally, with other instruments, to foster innovation and inspire transformative ideas that can enhance urban climate resilience and contribute to adaptation and mitigation responses to the challenge of climate change and its effects, from the bottom up.[1449] Insofar as SPLUM by-laws relate to climate change mitigation and adaptation and urban climate resilience (and the interrelated environmental aspects involved therein and incidental thereto), the Le Sueur-case deserves mention here. The Le Sueur-case underscored that environmental and conservation concerns (which include climate change) cannot be divorced from municipal planning, as municipalities are mandated "to legislate in respect of environmental matters to protect the environment at the local level."[1450] By-laws providing for aspects of urban climate resilience could play an indispensable role in

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[1445] See particularly the wording of ss 17(1)(a) and (d) of the Climate Change Act. It denotes that "an *MEC and a mayor of a metropolitan or district municipality*, as the case may be- a) … undertake a climate change needs and response assessment for the province, metropolitan or district municipality, as the case may be; … and d) develop, implement and publish in the Gazette a climate change response implementation plan as a component of, and in conjunction with, *provincial, metropolitan or district municipal planning instruments*, *policies and programmes*." Own emphasis added.

[1446] See para 4.3 above.

[1447] De Visser and Poswa 2019 *PELJ* 10.

[1448] See De Visser and Poswa 2019 *PELJ* 25-26.

[1449] See Jörgensen, Jogesh and Mishra 2015 *Journal of Integrative Environmental Sciences* 235, 237.

[1450] Le Sueur-case paras 29, 40. See also Du Plessis and Van der Berg 2014 *Stell LR* 581-582, 589-590; Freedman 2014 *PELJ* 585-588; Humby 2014 *PELJ* 1670-1671, 1680; Van Wyk and Oranje "The Climate Change Mitigation and Adaptation Imperative in South Africa's Spatial Planning and Land Use Management, 2013" 273.

enhancing urban climate resilience if the definition of planning law suggested above[1451] were to be applied.

SPLUM by-laws also present opportunities to mandate the inclusion of climate-responsive infrastructure; protection of vulnerable areas; integration of nature-based solutions in urban environments[1452] and climate-sensitive building initiatives for new developments and redevelopment projects;[1453] and the creation of incentives to encourage such developments. These standards may include requirements for energy-efficient building materials, renewable energy integration, retrofitting existing developments, and passive design features that reduce energy consumption and greenhouse gas emissions.

Some municipalities have applied this legislative discretion by incorporating aspects of urban climate resilience into their SPLUM by-laws, reflecting the localised needs for climate mitigation and adaptation prior to the enactment of the Climate Change Act. There are some notable examples, though it should be noted that the examples discussed here are not an extensive or exclusive list, but rather that the examples are provided to illustrate how the discretionary legislative powers translate into practice.

Drakenstein Local Municipality's *Municipal Land Use Planning By-law* (2018)[1454] includes discretionary zoning provisions through the provision for "overlay zones" that stipulate additional development parameters or use rights to the base zoning, and may include parameters relating to development incentives, density limitations, urban form and renewal, heritage or environmental protection, and management of the urban edge, amongst others.[1455] This may include zoning provisions to manage development in environmentally sensitive areas as envisioned in the LUPA.[1456] It also

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1451 See 4.2.2 above.
1452 See para 2.5.4 above.
1453 See para 2.5.5 above. This could arguably fall under the scope of building regulations, which is a designated local government competence in terms of Schedule 4B, along with municipal planning and incidental thereto.
1454 Drakenstein Local Municipality *Municipal Land Use Planning By-law* (2018) (hereafter the *Drakenstein Municipal Land Use Planning By-law*).
1455 See ss 1 and 17(8) of the *Drakenstein Municipal Land Use Planning By-law.*
1456 See ss 22, 36(5) and 36(6) of the LUPA.

sets out criteria for decision-making that must be considered by the relevant decision-making body, which notably include the impact of the proposed land development on municipal engineering services. Such decision-making body may also approve applications subject to conditions[1457] that relate to the provision of engineering services[1458] and infrastructure, requirements relating to engineering services, settlement restructuring, agricultural or heritage resource conservation, biodiversity conservation and management, provision of housing with the assistance of a state subsidy, social facilities or social infrastructure, energy efficiency, requirements aimed at addressing climate change, and the submission of a construction management plan to manage the impact of the construction of a new building on the surrounding properties or the environment. Drakenstein also has other by-laws incidental to or relevant for its municipal planning function, such as its *Building Control By-law* (2020), *Problem Premises By-law* (2020), and *Zoning Scheme By-law* (2018), among others.[1459] The Zoning Scheme By-law is particularly important as it incorporates aspects such as green infrastructure,[1460] informal

[1457] See s 66 of the *Drakenstein Municipal Land Use Planning By-law*.

[1458] "Engineering service" refers to a system for the provision of water, sewerage, electricity, municipal roads, storm-water drainage and gas, and for solid waste collection and removal, required for the purpose of land development. See s 1 of the LUPA.

[1459] See also, for example, Drakenstein Local Municipality *Informal Trading By-law* (2023); *Problem Building By-law* (2012); *Streets By-law* (2007); *By-Law Relating to the Installation of Telecommunications Infrastructure* (2024).

[1460] Defined in s 1 of the Drakenstein Local Municipality *Zoning Scheme By-law* (2018) as "man-made or natural green corridors, wetlands, biological corridors or stormwater management facilities which are required because of development, to protect biodiversity, ensure links between biodiversity sites, or any other such purpose which has the effect of improving climate resilience."

trading,[1461] open spaces,[1462] and passenger or public transport,[1463] relating to urban climate resilience as suggested in Chapter two of the study.[1464]

The Stellenbosch Local Municipality's *Stellenbosch Municipality: By-law on Municipal Land Use Planning* (2023)[1465] is similar to that of Drakenstein regarding the application procedures[1466] and many of the decision-making considerations for development applications.[1467] It allows for conditions relating to settlement restructuring; provision of housing with the assistance of a state subsidy, social facilities or social infrastructure, agricultural or heritage resource conservation, biodiversity conservation and management, energy efficiency,[1468] and requirements aimed at addressing climate change.[1469] Interestingly, these by-laws also allow the municipalities to issue guidelines regarding the submission of information, documents or procedural requirements.[1470] These provisions are wide in their application and arguably endow municipalities with the discretion to request developers to include incentives for the use of measures such as WSUD, measures taken to protect ecosystem services such as compliance with environmental management instruments and information on the relevant authorisations obtained from other spheres of government concerning the proposed development, for example. Stellenbosch also has separate by-laws dealing with problem

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1461 Informal trading denotes the "legal selling of products in outdoor areas which may be from temporary structures, in accordance with the Municipality's informal trading by-law". See s 1 of the *Zoning Scheme By-law* (2018).

1462 Which is described in s 1 of the *Zoning Scheme By-law* as "land which may be public or privately owned and which is set aside for open space, such as a park, garden, vegetable garden, square, river or stream and may include private roads as well as ancillary structures for management and maintenance of such open spaces".

1463 Public transport means "all infrastructure, buildings or structures required for providing a service for the mass transport of people by means of buses, trains, mini-buses or any other similar means of transport and includes staging areas, bus stations, train stations, bus stops, transport interchanges and all ancillary facilities such as maintenance areas, offices for the administration and management of the facility, shops, restaurants and ablution facilities which serve the people using these facilities". See s 1 of the *Zoning Scheme By-law*.

1464 See para 2.5 above.

1465 Stellenbosch Local Municipality *Stellenbosch Municipality: By-law on Municipal Land Use Planning* (2023) (hereafter the *Stellenbosch Municipal Land Use Planning By-law*).

1466 See, for example, ss 35-38 of the *Stellenbosch Municipal Land Use Planning By-law.*

1467 See ss 60-66 of the *Stellenbosch Municipal Land Use Planning By-law.*

1468 See also s 38 of the Stellenbosch Local Municipality *Zoning Scheme By-law* (2024) (the *Stellenbosch Zoning Scheme By-law*).

1469 See ss 66(2)(d)-(i) of the *Stellenbosch Municipal Land Use Planning By-law.*

1470 See s 38(3) of the *Stellenbosch Municipal Land Use Planning By-law*.

properties,[1471] municipal roads,[1472] parking,[1473] open spaces and conservation areas,[1474] and zoning.[1475] Similar examples can be found in the municipal planning by-laws and zoning scheme by-laws of Buffalo City Metropolitan Municipality,[1476] George Local Municipality,[1477] City of Mbombela,[1478] and Mogale City Local Municipality.[1479]

It is postulated that these discretionary provisions contribute to urban climate resilience as they incorporate aspects such as environmentally sensitive areas, green infrastructure and nature-based solutions, disaster risk management, energy and water efficiency, urban livelihoods through the integration of matters relating to informal settlements and the informal trading sector, and integration of transportation networks and infrastructure as part of its local government planning mandates. Based on the examples above, it is deduced that while there is space for discretion within existing by-laws, municipalities seem to favour having separate by-

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1471 Stellenbosch Local Municipality *Problem Property By-law* (2020).

1472 Stellenbosch Local Municipality *Street By-law* (2021).

1473 Stellenbosch Local Municipality *Parking By-law* (2020).

1474 Stellenbosch Local Municipality *By-Law Relating to Plantations, Parks, Gardens, Recreation Facilities and Nature Reserves* (date unknown).

1475 *Stellenbosch Zoning Scheme By-law*.

1476 Buffalo City Metropolitan Municipality *Municipal Spatial Planning and Land Use Management By-law* (2016). This municipality does not seem to have a zoning scheme by-law, at least one that is recent. The researcher could only find Zoning Scheme Regulations, but they are severely outdated as they are from 2007 and thus predate SPLUMA. See Buffalo City Metropolitan Municipality *Buffalo City Zoning Scheme Regulations* (2007). See also other planning-related or incidental to planning - Buffalo City Metropolitan Municipality *Disaster Management By-law* (2021); *Informal Trading By-law* (2022); and *Roads and Streets By-law* (2011), which is arguably outdated.

1477 George Local Municipality *George Municipality Land-use Planning By-law* (2023); George Local Municipality *George Integrated Zoning Scheme By-law* (2017). George's zoning scheme is noticeably shorter than that of Drakenstein and Stellenbosch but generally provides for similar aspects, if perhaps in less detail.

1478 Mbombela Local Municipality *City of Mbombela Spatial Planning and Land Use Management By-Law* (2019). Mbombela does not appear to have a zoning scheme by-law, as some of the other municipalities, but it does have a separate by-law for its CID – see Mbombela Local Municipality *City Improvement Districts (CID) By-laws for Nelspruit*. Mbombela also has a *Municipal Roads and Streets By-law* (2021).

1479 Mogale City Local Municipality *Spatial Planning and Land Use Management By-law* (2016). This municipality also has the following municipal planning-related or incidental matters incorporated in by-laws, and while many of them unfortunately pre-date SPLUMA, they hold vast potential to contribute to the municipal planning functions stipulated in SPLUMA. See, for example, Mogale City Local Municipality *Management and Control of Informal Settlements in Mogale City By-law* (2013), *Parks and Open Spaces, Management of Trees and Facilities at Dams By-law* (2007), *Urban Greening and Bio-diversity Preservation By-law* (2007), and *Street Trading By-laws* (2000).

laws for arguably related and incidental matters to their planning mandates, rather than having the incidental matters amassed into a singular spatial planning by-law.

4.6 Concluding remarks

This chapter sets out to determine the extent to which local SPLUM by-laws, in the South African context, can enhance urban climate resilience.[1480] In determining the role of such by-laws and to what extent they can enhance urban climate resilience, specifically, this chapter considered the contextual background of spatial planning and land use management, as well as the legal framework encapsulated in terms of planning law,[1481] in the South African local government context, and with particular focus on the municipal planning mandates afforded to the local sphere of government.[1482]

Accordingly, the definition of planning law proposed by other authors does not adequately encompass the vast considerations envisioned by SPLUMA, and does not adequately reflect the role that local governments play in this complex milieu.[1483] As such it is suggested that a new, more encompassing definition that not only includes the updated development principles required by SPLUMA, but also ties in with the development principle of spatial resilience, and the concomitant economic, social, environmental, and governance spheres and contexts, as well as features of urban climate resilience proposed throughout this study, be adopted.[1484] The proposed definition also shows recognition of the ever-changing urban development dynamics that a developing country such as South Africa is inevitably still facing.[1485]

This chapter further aims to situate SPLUM by-laws into the wide range of planning instruments contained in the legal framework for spatial planning and land use management.[1486] These instruments are discussed with the aim of determining the

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[1480] See para 4.1 above.
[1481] See paras 4.2.1 and 4.2.2 above.
[1482] See para 4.2.2 above.
[1483] See para 4.2.2 above.
[1484] See para 4.2.2 above.
[1485] See paras 4.1 and 4.2.1 and 4.2.2 above.
[1486] See paras 4.2.3.1, 4.2.3.2, and 4.2.3.3 above.

particular significance and usefulness of by-laws, as opposed to the existing legally required instruments in enhancing urban climate resilience.[1487] To do this, the chapter ventures to determine the design and function of these instruments relative to (or versus) SPLUM by-laws.[1488]

The role of SPLUM by-laws is threefold. Firstly, these by-laws fulfil a regulatory role in which it regulates land use and development and prescribes the "how and by whom" factors in the development application and decision-making processes.[1489] By-laws play an indisputable role in regulating land use management and spatial planning, given their strong command-and-control nature and legal enforceability compared to the guiding and long-term vision aspirations and plans set forth in especially the IDP and SDF.[1490] As such, these by-laws contain the legal mechanisms to implement and enforce IDPs, SDFs, and LUSs (or zoning schemes).[1491] These by-laws, regulate zoning categories, permissible land uses, building regulations. and procedures ascribed to development applications and decisions.[1492] They further regulate time frames for decision-making and the internal processes involved in these applications, and other restrictions that are aimed at ensuring that land is used in a way that is compatible with the municipality's development objectives and capacity.[1493] This regulatory role also promotes transparency, accountability, and inclusivity in municipal governance through regulating public participation and engagement procedures aimed at spatial justice and equality, as well as efficiency, sustainability, and resilience, as required by the development principles.[1494]

Secondly, SPLUM by-laws play an institutional role in enhancing urban climate resilience. This role is served through provisions in the by-laws that define the functions, procedural rules, operational guidelines, composition, and responsibilities of the internal institution of the municipality, whether it be the decision-making,

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[1487] See paras 4.2.3 and 4.2.4 above.
[1488] See paras 4.2.3 and 4.2.4 above.
[1489] See para 4.3 above.
[1490] See para 4.2.4 above.
[1491] See paras 4.2.4 and 4.3 above.
[1492] See para 4.3 above.
[1493] See para 4.3 above.
[1494] See para 4.3 above.

planning, or appeal authorities or entities, the municipal council, or administration involved in development applications.[1495] They also determine the institutional processes related to the submission, consideration and decisions on development applications, and establish the fees, requirements, timelines and relevant considerations applicable to such applications.[1496] They operationalise and empower municipalities to execute their municipal planning mandates in terms of the Constitution, SPLUMA, the MSA and other relevant national and provincial legislation. In doing so, this institutional role ensures the autonomy of local government relating to its legislative and executive mandates and facilitates good governance by fostering transparency, efficiency, and accountability.[1497]

Lastly, SPLUM by-laws guide municipalities in the alignment and streamlining of their plans and policies with those at the provincial and national levels and help municipalities to integrate these policies into their planning practices.[1498] They guide municipalities in balancing development needs with socio-economic and environmental concerns, and enhance urban climate resilience through climate-sensitive planning initiatives and incorporation of the actionable features of urban climate resilience into their planning instruments and giving effect thereto through their by-laws.[1499]

SPLUMA is not specific on the contents of SPLUM by-laws. Although it provides a relatively structured framework and requires the inclusion of certain provisions, it is not considered restrictive, even if read with the MSA provisions on by-laws.[1500] Municipalities, therefore, have significant discretion to tailor these laws to their local contexts, challenges, and priorities. This non-restrictive nature of the contents of municipal planning by-laws leaves room for innovation and experimentalism as long as it does not conflict with national and provincial legislation.[1501] Municipalities have

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[1495] See para 4.4 above.
[1496] See para 4.4 above.
[1497] See para 4.4 above.
[1498] See para 4.5 above.
[1499] See para 4.5 above.
[1500] See para 4.5 above.
[1501] See para 4.5 above.

ample space to manoeuvre on this metaphorical "almost-blank" canvas, to exercise their legislative discretion to include the features of urban climate resilience or aspects related thereto into their spatial planning and land use management, or even related separate by-laws as in the examples mentioned above.[1502] The practice in municipalities seems to steer towards the latter option.[1503]

SPLUM by-laws are crucial tools for enhancing urban climate resilience, as they integrate regulatory, institutional, and guiding roles to address climate risks and vulnerabilities and, as such, provide a wide range for municipalities to innovatively integrate and enhance urban climate resilience into their by-laws. The discussion now turns to the empirical part of the study, where participants from three local municipalities were interviewed to establish to what extent SPLUM by-laws in practice provide for aspects of urban climate resilience, and to assess the state of these by-laws in the relevant municipalities.[1504]

[1502] See para 4.5 above.
[1503] See para 4.5 above.
[1504] See para 5 below. See also paras 1.7 and 1.8 above.

CHAPTER 5 THE STATUS QUO OF SPLUM BY-LAWS IN SECONDARY CITIES

5.1 Introduction

This chapter investigates the *status quo* of the SPLUM by-laws in the three selected secondary local municipalities.[1505] The chapter provides a critical assessment of these cities as a case study into the use of by-laws, specifically SPLUM by-laws, for enhancing urban climate resilience for South African cities. As indicated at the start of this study,[1506] the researcher employed a mixed-method research methodology based on legal and empirical research, consisting of a literature review (desktop analysis) of primary and secondary sources of law of each municipality under study, as well as semi-structured interviews conducted in these secondary cities.[1507] The discussion that follows is based on the different personal perceptions, experiences, understandings, and contextual interpretations by the administration staff of a range of departments in Emfuleni Local Municipality, Msunduzi Local Municipality, and Polokwane Local Municipality regarding the use of by-laws and law-making authority of municipalities in responding to the effects of climate change. Given the complex nature of urban climate resilience and that many participants did not seem familiar with the term,[1508] the researcher could not directly probe into urban climate

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1505 See paras 1.8 above and 5.2 below.

1506 See para 1.8 above.

1507 Ethical clearance was obtained from the Faculty of Law Research Ethics Committee (LAWRec), which was issued on the 12th of August 2022 under ethics number Law NWU-01504-19-S3/01. LAWRec considered the risk level of the study to be negligible. Therefore, no further approval from additional committees or a full research ethics review was necessary. The ethics application and ethics approval certificate are on file with the researcher. Each municipality approached had gatekeepers, and permission letters to conduct research within each municipality were obtained before participants could be approached for an interview.

1508 At the start of the interviews, participants were asked whether they were familiar with the term "urban climate resilience". If they responded no, the researcher gave an overview of the concept in the context of the study as part of the background information. If they answered yes, the researcher would not focus the background discussion on urban climate resilience as a concept but rather on how it fit into the bigger theme of the research and objectives of the study. Only two participants had indicated that they had heard of the term urban climate resilience or had an idea of what the notion of resilience or climate resilience entailed. Participant C indicated that they had heard the term but that it was not mainstreamed into their documents at the time of the interviews. Participant H also indicated that they had heard of the term before, but that they did not work directly with it, but that a colleague was working on it (the colleague was not available for an interview). The rest of the participants asked for an explanation of the term.

resilience as such, but had to approach the questions from a broader angle.[1509] The interviews conducted served to ascertain, *inter alia*, the role of the law and municipal by-law drafting, the *status quo* of the municipal by-laws (especially insofar as it relates to the implementation of SPLUM by-laws), and the potential of these by-laws to promote urban climate resilience.[1510] The participants concerned were from the spatial planning and land use management, environmental management, and legal services departments of these municipalities. Not all departments envisioned in Chapter one of this study were included in the interviews. The reasons range from incorrect information reflected on the respective municipality websites to prospective participants not responding to email invitations or phone calls. Some prospective participants indicated that they are not willing to participate or are not the correct persons to give interviews. Due to time and financial constraints, it was not possible to conduct further interviews, be it follow-up interviews or interviews from all the proposed departments. A total of 11 participants were interviewed. They comprised a combination of participants from the by-law,[1511] land use, spatial planning, environmental management, and legal services departments, depending on the departmental divisions of the relevant municipality.

This chapter consists of six parts. The first part provides an overview of the case study design and method. The second part delves into the urban profiles and inclusion and recognition of features for urban climate resilience in each of the selected municipalities, namely: Emfuleni Local Municipality, Msunduzi Local Municipality, and Polokwane Local Municipality. It also includes an overview of each

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[1509] The questionnaire was compiled and approved by the ethics committee before the interviews were held, shortly after the proposal was approved and before the researcher had written the bulk of Chapter two in which this term is explained at length.

[1510] Due to participants not being familiar with the notion of urban climate resilience *per se*, the researcher had to ask indirect questions to which people would be able to relate and respond, with the view that the researcher could gain insight into what is directly relevant for the study.

[1511] This department seems unique to the relevant municipality that refers to this department as the "Super by-law department" – the name is a bit of a misnomer as they are not the sole department responsible for by-law drafting, implementation or enforcement. They do, however, comment on by-laws drafted by other line departments, such as those from the spatial planning and land use department.

municipality's by-law, though this discussion is limited to any key distinctions and how recent and comprehensive the by-laws of each municipality are.

The chapter then illustrates participants' responses to the question posed in the semi-structured interviews. The discussion then turns to the analysis of the responses received and is followed by the concluding remarks, which contain critical findings on the SPLUM by-laws, and other relevant findings.

5.2 Case study design

This study comprises a mixed-method research methodology[1512] in which Chapters one to four consist of a literature review of sources, including primary and secondary sources of law, while this chapter encompasses a qualitative research method[1513] using semi-structured interviews[1514] conducted from 10 October to 18 November 2022.[1515]

As explained earlier,[1516] Emfuleni Local Municipality, Msunduzi Local Municipality, and Polokwane Local Municipality are all categorised as secondary cities in the SACN report series on Secondary Cities in South Africa and were chosen based on selected indicators used by SACN, such as the demographics (population size and density), economic strength (GDP and economic growth or decline), income levels (income per capita), public finances (annual total revenue), and employment.[1517] They were

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1512 Mixed-methods research is often either an integration of the use of both quantitative and qualitative research methods in a single project, and is also "routinely used in applied social and behavioural science research … which seeks to prompt community change or social action." Leavy *Research Design* 9.

1513 The qualitative research method is mostly used in social science research, and instead of focusing on numerical data, as is the case with quantitative research, it rather explores attitudes, behaviours, experiences, and perceptions of participants and relies on words and comprises case studies, as in the study at hand. It is further described "as an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem" and generating meaning through inductive approaches to knowledge building. See Dawson *Introduction to Research Methods* 14-15; Creswell *Research Design* 4,185-187; Leavy *Research Design* 9.

1514 Semi-structured interviews are one form of interview that researchers may employ and consist primarily of open-ended questions that allow the researcher or "interviewer to build upon and explore their participants' responses to questions" while also allowing "the interviewer and participant to maintain a sense of focus" during the interview. This interview method also allows for follow-up questions and elaboration as it consists of a semi-structured question format. See Seidman *Interviewing as Qualitative Research* 15, 19, 81, 84. This questioning method consists of asking all participants similar questions to obtain similar information, "which can then be compared and contrasted with the information obtained in the other interviews", while still maintaining the necessary "flexibility for other important information can still arise" from the individual participants. See Dawson *Introduction to Research Methods* 28-29.

1515 Funding for the empirical part of this study lapsed on 20 November 2022 and was not transferable to a later date in the study. As the ethics approval was only granted in August 2022, this gave the author only four months within which to approach gatekeepers and obtain permission to conduct the interviews in the respective municipalities. This caused difficulty in reaching out to more participants.

1516 See para 1.6 above.

1517 SACN *Secondary Cities in South Africa: The Start of a Conversation* 8; SACN *Outside the Core: Towards an Understanding of Intermediate Cities in South Africa* 24-33; SACN *Profiling Intermediate Cities in South Africa* 12. See also Donaldson, Marais and Nel "Secondary Cities in South Africa" 123-124.

further selected from three different provinces to get an overview of the use of by-laws in different geographical areas in the country. Furthermore, these cities are classified as large and semi-diverse intermediate city municipalities (ICMs). All three cities have a population exceeding 500 000 people, house more than one per cent of the national population, and all three are inland cities.[1518] Msunduzi and Emfuleni are also classified as part of the top ten most densely populated cities in South Africa, with Polokwane in the top 15.[1519] All three cities fall within the top ten largest city economies in the country.[1520]

The discussion of the respective SPLUM By-laws, as alluded to above,[1521] is limited to key distinctions and how recent and comprehensive the by-laws, as all three by-laws have certain key similarities. Firstly, they are designed to align with the SPLUMA, ensuring a standardised approach to spatial planning and land use management across South Africa,[1522] meaning the contents are vastly similar. Secondly, in line with provisions of the MSA and SPLUMA, each municipality integrates its spatial planning processes with the Integrated Development Plan (IDP), which promotes coordinated[1523] and sustainable development and planning. As per the requirements and principles of good governance,[1524] transparency,[1525] accountability,[1526] democracy, just administration,[1527] and spatial and environmental

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[1518] See Main *The Local Government Handbook: South Africa 2021* 77,104, and 123. This research was based on data from 2016 as well as Census data from 2011 (new census data have only recently been made available concerning the 2022 Census).

[1519] This was the position in 2014 at the time of publication of SACN *Secondary Cities in South Africa: The Start of a Conversation* 36. See also the populations of these secondary cities in Main *The Local Government Handbook: South Africa 2021* 77,104, and 123 – they are among the five most populated secondary cities in South Africa (see SACN *Profiling Intermediate Cities in South Africa* 11).

[1520] This was the position in 2014 at the time of the publication of SACN's *Secondary Cities in South Africa: The Start of a Conversation* 37.

[1521] See para 5.1 above.

[1522] See paras 4.1 and 4.2 above.

[1523] Linking back to the feature of "coordinated and cooperative government" - See paras 2.5.6 and 3.3.6 above.

[1524] Linking back to the feature of "coordinated and cooperative government" - See paras 2.5.6 and 3.3.6 above.

[1525] Linking back to the feature of "coordinated and cooperative government" - See paras 2.5.6 and 3.3.6 above.

[1526] Linking back to the feature of "coordinated and cooperative government" - See paras 2.5.6 and 3.3.6 above.

[1527] Linking back to the features of "inclusive community structures and processes" and "inclusive community structures and processes" - See paras 2.5.3, 2.5.6, 3.3.3, and 3.3.6 above.

justice,[1528] there is provision for public participation procedures, with a common emphasis on involving the public in planning and development decision-making processes,[1529] recognising the importance of community input in shaping development outcomes for the areas in which they work or live.[1530] It is important to note that none of the three SPLUM by-laws under scrutiny define "climate change," "urban resilience," or "adaptation," although some environmental and climate principles are invoked. There is also no mention of green building standards and none of the three by-laws require or incentivise climate-resilient building designs (e.g. through energy efficiency, etc.). In terms of monitoring and evaluation, all the by-laws provide in some way for amendment and review of instruments such as the SDF and LUS, but the features for climate resilience, as such, are not mandated or detailed.

The participants selected for this study included municipal officials forming part of the administration of the municipality, in a variety of departments related to or dealing specifically with the law, the environment, by-law making, and spatial or town planning and land use management. The study was limited to these departments to be able to form a coherent baseline in line with the focus on SPLUM by-laws in the respective cities. Furthermore, it is apt to note that the real-life division of line functionaries or departments does not always correspond with the information published in the public domain.

Triangulation was employed as the method to validate the data collected in the semi-structured interviews. A literature review (desktop study) was utilised for the analysis of any instruments or documents mentioned to see whether the information the participants alluded to in the interviews corresponded with that of the sources, in an attempt to establish the accuracy of the data.[1531] In the context of this study,

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[1528] See para 4.2.1 above.

[1529] Linking back to the feature of "inclusive community structures and processes" - See paras 2.5.3 and 3.3.3 above.

[1530] Linking back to the features of "inclusive community structures and processes" and "LED and sustainable livelihoods" - See paras 2.5.3, 2.5.1, 3.3.1, and 3.3.3 above.

[1531] See Ritchie 'The Application of Qualitative Methods of Social Sciences' 43; Bryman *Social Research Methods* 569.

the researcher also used triangulation to compare the answers of each participant with those of the other participants with the intent to capture the commonalities in the responses. Such commonalities would suggest that the answers were more accurate or credible insofar as this method allows. The continuous comparisons, therefore, pertain to the content of the municipal by-laws and other instruments and the content of the semi-structured interviews (through transcriptions), which are also considered against legally prescribed municipal executive and legislative authority and responsibilities as discussed in Chapter three of the study[1532] and in terms of urban climate resilience.[1533]

It should be noted that in the discussion that follows, the identity of the municipalities and the officials who were questioned remain anonymous in compliance with the North-West University's approval for ethics clearance. All efforts have been taken to provide an accurate representation of the study's findings without jeopardising participant identity.

5.3 The secondary cities under study

The participants in this study work in different municipalities and in a range of departments, depending on the composition of departments within the respective municipalities. The answers given by participants reflect their personal experiences and perceptions of the *status quo* of their municipalities and their portfolios or departments. As such, the answers are not a reflection of the views of any of the municipalities or their management. A literature study (desktop analysis) was conducted on each participating municipality's development and the inclusion and recognition of features for urban climate resilience in its law and policy frameworks. This inquiry aimed to gain insight into the development profile of each municipality and how the participants understood and perceived climate resilience in reference to the work they conduct as a department in their particular city. As some of the participants referred to other planning instruments at their disposal, the researcher

[1532] See para 3.4 above.
[1533] See paras 2.2 and 2.4 above.

included an analysis of whether these instruments could be construed to include urban climate resilience directly or indirectly.[1534]

5.3.1 Emfuleni Local Municipality

5.3.1.1 Urban Profile

Emfuleni Local Municipality falls under the Sedibeng District in the Gauteng Province and is home to a population of approximately 945 600 people.[1535] According to the Emfuleni Local Municipality's SDF, the municipality is located on the peripheries of Gauteng and is considered to not be ideally located in terms of access to core employment opportunities found within the Johannesburg CBD and the Tshwane CBD, but that it is connected to these areas through the freeway network that connects these regions.[1536] Emfuleni comprises urban and rural (comprising smallholdings and farmland) areas, though the urban part houses more than 80% of the population in the municipality. Furthermore, Emfuleni includes (amongst others) Evaton, Sebokeng, Vanderbijlpark, Boipatong, Bophelong, Sharpeville, Vereeniging, and Three Rivers.[1537]

[1534] The proposed actionable features, identified in Chapter two of the study, did not appear verbatim in the documents under analysis, nor were they expected to. As such, the researcher looked for elements or parts of the features and subsequently linked them to the most suitable feature. The intention was not to discuss the features at length here, as they were extensively provided for in Chapter two of the study and were merely cross-referenced in this section of the study. In many instances, the overlaps between aspects of the features and the broad way in which certain aspects were included in the documents also led to the identification of more than one feature for a single part or aspect in the documents.

[1535] Good Governance Africa *Governance Performance Index – South Africa 2024* 19.

[1536] Urban Dynamics *Gauteng Emfuleni Spatial Development Framework (SDF) 2023-2024* 24.

[1537] Urban Dynamics *Gauteng Emfuleni Spatial Development Framework (SDF) 2023-2024* 24.

Figure 5-1: Map of Emfuleni Local Municipality[1538]

In 2022, the municipality's per annum population growth was 2.62%, having increased significantly from 0.37% in 2016.[1539] Emfuleni Local Municipality houses an approximate 297 910 households.[1540] Service delivery in terms of flush toilets connected to sewerage systems and piped water inside dwellings has incrementally increased over the period from 2011 to 2022, however, the provision for electricity for lighting has been relatively stable, while weekly refuse removal has seen a decline in the same period.[1541] There are currently two well-established CBDs that service Emfuleni, namely the Vereeniging and Vanderbijlpark CBDs.[1542] Sebokeng CBD is also well on its way to becoming a well-established CBD in Emfuleni, and it is projected to form the hub for urban development, along with the other two CBDs.[1543]

[1538] Municipalities of South Africa 2024 https://municipalities.co.za/map/1060/emfuleni-local-municipality.

[1539] Municipalities of South Africa https://municipalities.co.za/demographic/1060/emfuleni-local-municipality.

[1540] Municipalities of South Africa https://municipalities.co.za/demographic/1060/emfuleni-local-municipality.

[1541] See Municipalities of South Africa https://municipalities.co.za/demographic/1060/emfuleni-local-municipality.

[1542] Emfuleni Local Municipality *Emfuleni 5th Administration IDP for Year 2023-24* 18.

[1543] Emfuleni Local Municipality *Emfuleni 5th Administration IDP for Year 2023-24* 18.

According to the Emfuleni SDF 2023-2024, it is estimated that there are roughly 44 000 informal households living in informal settlements, and approximately 70 000 informal households living within backyard shacks within Emfuleni.[1544] The formal sector of the economy in Emfuleni employs almost 90% of the economically active population while the informal sector only employs about 11% of the economically active population.[1545] The unemployment levels in this municipality are also considered to be relatively high, as an estimated 39% of the economically active population is either unemployed or discouraged to continue looking for work.[1546]

Emfuleni Local Municipality had a "qualified audit"[1547] for both the 2021/2022 and 2022/2023 financial years and has been under section 139(5) administration[1548] since June 2018.[1549]

5.3.1.2 Examining the inclusion and recognition of features for urban climate resilience

The Emfuleni Local Municipality's IDP showcases cognisance of the suitability and need for certain land uses. In the IDP, the municipality includes an SDF map indicating land proposed for residential development, as well as parcels of land with constraining factors such as environmentally sensitive areas and geotechnical

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1544 Emfuleni Local Municipality *Emfuleni Spatial Development Framework (SDF) 2023-2024* 37.
1545 Emfuleni Local Municipality *Emfuleni Spatial Development Framework (SDF) 2023-2024* 41.
1546 Emfuleni Local Municipality *Emfuleni Spatial Development Framework (SDF) 2023-2024* 40.
1547 A "qualified audit opinion" (with findings) indicates that the municipality did not manage and account for its finances to achieve the best results. It is an indicator that the financial statements of the municipality contain material misstatements about specific amounts or are indicative of insufficient evidence for AGSA to make an accurate finding on whether the amounts have been materially misstated. See AGSA date unknown https://mfma-2023.agsareports.co.za/pages/audit-101#audit-of-financial-statements.
1548 Section 139(5) of the Constitution holds that "If a municipality, as a result of a crisis in its financial affairs, is in serious or persistent material breach of its obligations to provide basic services or to meet its financial commitments, or admits that it is unable to meet its obligations or financial commitments, the relevant provincial executive must impose a recovery plan aimed at securing the municipality's ability to meet its obligations to provide basic services or its financial commitments, which - (i) is to be prepared in accordance with national legislation; and (ii) binds the municipality in the exercise of its legislative and executive authority, but only to the extent necessary to solve the crisis in its financial affairs;… or if the Municipal Council is not dissolved in terms of paragraph (b), assume responsibility for the implementation of the recovery plan to the extent that the municipality cannot or does not otherwise implement the recovery plan."
1549 Main *The Local Government Handbook: South Africa 2024* 81.

conditions, which are deemed unsuitable for urban development.[1550] Emfuleni, and particularly the Vereeniging and Vanderbijlpark areas, are earmarked for inner-city regeneration by investing in, amongst others, trees and other aesthetics,[1551] as these CBDs are considered to be in a state of decay and emptiness, as major companies move out of the CBD areas.[1552]

The SDF also illustrates the accessibility and linkages between the transport corridors and different transport systems, such as the railway and bus routes, as well as existing freeways and other roads, and makes provision for transport infrastructure land allocation.[1553] As a majority of households within Emfuleni rely on public transport to access employment opportunities and social amenities, Emfuleni encourages and promotes the use of public transport within urban areas and holds that one reason to do so is in the interest of reducing carbon emissions, which is the primary cause of climate change.[1554]

The SDF describes Emfuleni's infrastructure as "overburdened, largely due to population growth and the poor state of the infrastructure" and highlights challenges relating to replacing, restoring and maintaining existing infrastructure, because there is constant focus on adding new infrastructure and making constant impromptu repairs.[1555] The Emfuleni water system is also under strain due to the bulk water network being as old as 60-70 years, and being overburdened due to the demand for potable water. Additionally, the municipality highlights the need for long-term plans aimed at reducing sewer spillages and reducing the high bulk infrastructure costs associated with urban development.[1556] These plans are necessary as the existing sanitation infrastructure has reached the end of its lifespan

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1550 This reflects the presence of the features "nature-based urban planning" and "suitable built environment" – see paras 2.5.4 and 2.5.5 above. See also Emfuleni Local Municipality *Emfuleni 5th Administration IDP for Year 2023-24* 20.

1551 Which falls under the feature of nature-based urban planning – see para 2.5.4 above.

1552 Emfuleni Local Municipality *Emfuleni 5th Administration IDP for Year 2023-24* 37.

1553 That is included under the feature "suitable built environment" – see para 2.5.5 above. See also Emfuleni Local Municipality *Emfuleni Spatial Development Framework (SDF) 2023-2024* 45-48.

1554 Emfuleni Local Municipality *Emfuleni Spatial Development Framework (SDF) 2023-2024* 48.

1555 Emfuleni Local Municipality *Emfuleni Spatial Development Framework (SDF) 2023-2024* 51-52.

1556 This speaks to the features of "adequate basic services" and "suitable built infrastructure" – see paras 2.5.2 and 2.5.5 above. Emfuleni Local Municipality *Emfuleni Spatial Development Framework (SDF) 2023-2024* 55.

and can only be kept operational with a high risk of sewer spills and an urgency for new infrastructure to be constructed.[1557]

In relation to the environment, the SDF includes provisions for environmentally sensitive areas that are either irreplaceable sites[1558] or important sites[1559] and requires their inclusion in the proposed open space plan of Emfuleni, which restricts suitability for development in such sites.[1560] The SDF elaborates on the functions and need for open space conservation and emphasises its importance for hazard avoidance, resource conservation, ensuring community well-being, and educational purposes.[1561] It considers, inter alia, the role of open space in preserving flood-prone areas, slopes and geologically unstable ground, and protection of water sources (especially keeping drinking water sources uncontaminated), protection of linked areas or corridors of conservable indigenous vegetation, recreational and psychological relevance.[1562]

5.3.1.3 Spatial Planning and Land Use Management By-law

At the time of the interviews, the Emfuleni's SPLUM by-law was the 2018 version, meaning that it was a few years old and was considered relatively new. Though the overarching themes contained are generally similar, the contents included under these themes of Emfuleni's By-law are significantly less detailed than the other two municipalities. As such, it is arguably not as comprehensive as the SPLUM By-laws of Msunduzi and Polokwane, each of which has more provisions than the 94 sections of Emfuleni's SPLUM By-law. Emfuleni's SPLUM By-law also does not contain a preamble or long title as is customary for legislation, even at the local government level. Its land use scheme chapter consists only of four sections dealing with general matters concerning LUS, the purpose and content thereof, the legal effect thereof,

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1557 Emfuleni *Local Municipality Emfuleni Spatial Development Framework (SDF) 2023-2024* 54.

1558 Sites that contain fauna and flora unique to this area.

1559 Which are crucial for the healthy functioning of the ecosystem.

1560 This falls under the feature of "nature-based urban planning" – see para 2.5.4 above. Emfuleni Local Municipality *Emfuleni Spatial Development Framework (SDF) 2023-2024* 67.

1561 This construes the feature "nature-based urban planning" – see para 2.5.4 above. Emfuleni Local Municipality *Emfuleni Spatial Development Framework (SDF) 2023-2024* 137.

1562 Emfuleni Local Municipality *Emfuleni Spatial Development Framework (SDF) 2023-2024* 137-141. See also para 2.5.4 above.

and amendments. This by-law also provides for both the MPT and authorised officials[1563] and development management,[1564] but is more concise and narrower compared to Msunduzi and Polokwane. Interestingly, this by-law defines "open spaces"[1565] and includes provisions addressing open spaces, though these are limited, and the extent to which open spaces are included is not clear, as the copy available online omits the pages with the relevant provisions.[1566]

5.3.2 Msunduzi Local Municipality

5.3.2.1 Urban profile

Msunduzi Local Municipality, also known as Pietermaritzburg, forms part of the uMgungundlovu District Municipality, in KwaZulu-Natal (KZN) Province.[1567] Pietermaritzburg is the capital of the KZN province and the main economic hub of the district in which it is situated.

This city hosts a population of approximately 817 700 people, according to the 2022 census and has an annual population growth of 2.66% per annum.[1568] Moreover, the municipality hosts an approximate 213 727 households.[1569] As for its delivery of household services, the municipality has had a gradual increase in flush toilets

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1563 See ss 23-32 of Emfuleni's SPLUM By-law.

1564 See ss 33-35 Emfuleni's SPLUM By-law.

1565 Open space(s) denote "an area of land set aside and required to be legally protected, in the opinion and to the satisfaction of the Municipality, from development over and above the assignment of land use rights, which shall be for the use and benefit of a community, irrespective of ownership of such land and may include, in the opinion of the Municipality, recreational areas, natural areas, parks, public and private open space for purposes of compliance with these By-laws". See s 1 of Emfuleni Local Municipality *The Emfuleni Municipality Spatial Planning and Land Use Management By-laws* (2018) (Emfuleni's SPLUM By-Law).

1566 *Emfuleni's SPLUM By-Law* 53-55.

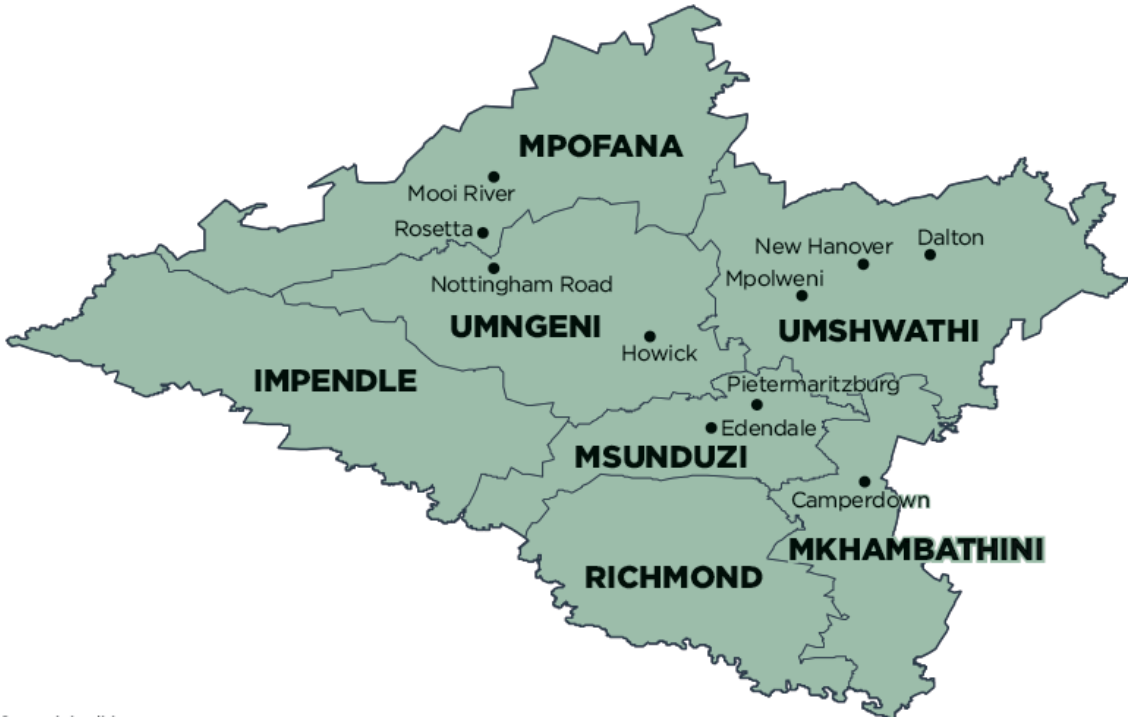
1567 Msunduzi 2018 http://www.msunduzi.gov.za/site/home/index.html; Municipalities of South Africa 2024 https://municipalities.co.za/overview/1088/msunduzi-local-municipality.

1568 Good Governance Africa *Governance Performance Index – South Africa 2024* 19; Municipalities of South Africa 2024 https://municipalities.co.za/demographic/1088/msunduzi-local-municipality.

1569 Municipalities of South Africa 2024 https://municipalities.co.za/demographic/1088/msunduzi-local-municipality.

connected to sewerage, weekly refuse removal, in-house piped water, and electricity for lighting.[1570]

Figure 5-2: Map of Msunduzi Local Municipality[1571]



The proximity of the Msunduzi municipality to the N3 highway, which connects it to important harbours and airports, gives it the chance to establish strong connections with the world economy.[1572] Msunduzi also provides nearby towns and municipalities access to a variety of growth and connectivity opportunities in several industries, including tourism, logistics, retail, manufacturing, and agriculture.[1573] Given that agriculture is prominent in the district, Msunduzi is considered the hub of the district's economy and offers great potential for agri-processing.[1574] The municipality,

[1570] See Municipalities of South Africa 2024 https://municipalities.co.za/demographic/1088/msunduzi-local-municipality.
[1571] Municipalities of South Africa 2024 https://municipalities.co.za/map/1088/msunduzi-local-municipality
[1572] Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 19.
[1573] Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 19.
[1574] Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 19.

as a Water Services Authority, purchases water in bulk from the water services provider, Umgeni Water (UW).[1575]

Msunduzi Local Municipality has been under section 139(1)(b) administration, in terms of the Constitution, from April 2019 to 30 April 2024. It is currently under section 139(a) administration as of 1 May 2024.[1576] The outcome of the most recent financial audit was a "qualified audit" (opinion with findings).[1577]

5.3.2.2 Examining the inclusion and recognition of features for urban climate resilience

Based on its position to major transport and industrial corridors, the municipality can also be considered a strategic location in terms of infrastructure in relation to other big cities.[1578] Msunduzi also provides ample employment opportunities, and as a result, the municipality faces high rates of in-migration.[1579] Msunduzi is also initiating an integrated rapid public transport network (IRPTN) in which it envisions five modes of transport, namely rail, bus, minibus taxi, metered taxi, and non-motorised transport (NMT), and it has identified room for improvement, specifically with regard to NMT.[1580]

In relation to environmental aspects, Msunduzi focuses on the biophysical environment, and underscores the importance of natural resources to and their interconnectedness with economic and social well-being and to development in the Msunduzi Municipality.[1581] The IDP holds that these resources are crucial as they

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1575 Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 26.

1576 Municipalities of South Africa 2024 https://municipalities.co.za/management/1088/msunduzi-local-municipality.

1577 See AGSA date unknown https://mfma-2023.agsareports.co.za/pages/audit-101#audit-of-financial-statements.

1578 Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 19.

1579 Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 19.

1580 Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 27. This reflects the presence of the feature "suitable built environment" – see para 2.5.5 above.

1581 This could be deemed to include the features of ""LED and sustainable livelihoods", "inclusive community structures and processes", and "nature-based urban planning", as it contains aspects of the economic, social and environmental contexts – see paras 2.4 and 2.5.1, 2.5.3 and 2.5.4 above. See also Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 21.

provide for the basic needs of the municipality's residents and of those in the broader context.[1582] Msunduzi currently has 46.3% of its land designated as natural open space, comprising high agricultural potential land, vulnerable ecosystems, protected areas, ecological support areas (ESAs), vital connections, and critical biodiversity areas (CBAs).[1583] Msunduzi only has one waste disposal facility, the New England Road Landfill Site, of which 29 ha out of 44 ha are currently being landfilled.[1584] In an attempt to extend the lifespan of the landfill site further than its current 5 years, the municipality has recently adopted a waste minimisation and diversion strategy.[1585] The Msunduzi Local Municipality was also subjected to court proceedings brought by the Human Rights Commission for failure to comply with its waste management licence and to fulfil its constitutional duties as required by section 24 of the Constitution.[1586] As a result, the court granted a declaratory relief and a structural interdict to ensure compliance.[1587]

The IDP identifies ageing infrastructure as one of the key challenges of the municipality, as a majority of the budget earmarked for water goes toward buying bulk water services from UW, which leaves little for asset maintenance.[1588] In this vein the municipality also identified a need for a comprehensive water conservation and water demand management plan.[1589]

1582 Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 21.

1583 This falls under the feature of "nature-based urban planning" – see para 2.5.4 above. Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 21.

1584 Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 26.

1585 This speaks to the features of "adequate basic services" and "suitable built infrastructure" – see paras 2.5.2 and 2.5.5 above. See also Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 26. See also Bracken 2024 https://groundup.org.za/article/nearly-100000-households-in-msunduzi-have-no-refuse-collection/; Ndaliso 2024 https://witness.co.za/news/kzn/2024/08/14/pietermaritzburg-landfill-site-sees-positive-turnaround/.

1586 See *South African Human Rights Commission v Msunduzi Local Municipality* 2021 6 SA 500 (KZP) paras 2, 19, 32-54. See also Diederick, Dube and Du Plessis 2023 *South African Journal on Human Rights* 3-8.

1587 *South African Human Rights Commission v Msunduzi Local Municipality* 2021 6 SA 500 (KZP) paras 101-106. See also Diederick, Dube and Du Plessis 2023 *South African Journal on Human Rights* 8-9.

1588 Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 26.

1589 Msunduzi Local Municipality *Final Integrated Development Plan 2022-2027* 26. This indicates the presence of the feature "adequate basic services" – see para 2.5.2 above.

5.3.2.3 Spatial Planning and Land Use Management By-law

*T*he *Msunduzi Municipality: Spatial Planning and Land Use Management By-law*[1590] (Msunduzi's SPLUM By-law) was more recent than that of Emfuleni, having been passed in 2020. Though it does not define open space(s) clearly and merely includes it under the definition of public facility,[1591] the By-law contains provisions dealing with open space(s) as pertain to the Municipal Planning Approval Authority's decisions.[1592] The Msunduzi SPLUM By-law contains a long title and comprises 184 sections, spread throughout 14 chapters, along with nine Schedules. It is arguably more comprehensive than that of Emfuleni,[1593] as it provides more comprehensively for LUS with 11 provisions in the LUS chapter, including the adoption, resolution, preparation, purpose, contents, legal effect, existing land use schemes, effects of boundary changes, amendments and review of LUS, and also contains a provision for the "inclusion of land that is occupied in an unstructured manner by a traditional community or indigent households in the land use scheme."[1594] It also provides in great detail, for land development applications and municipal planning approvals with 46 sections, including provisions regarding the MPT and Municipal Planning Approval Authority (MPAA).[1595] Msunduzi's SPLUM By-law does not contain a specific chapter dealing with development management, as is the case for Emfuleni and Polokwane, but seemingly incorporates or combines it with the chapter on land development applications.

5.3.3 Polokwane Local Municipality

5.3.3.1 Urban profile

The Polokwane Local Municipality is situated in Limpopo Province and falls under the Capricorn District Municipality.[1596] Polokwane has a composition of approximately

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1590 Msunduzi Local Municipality *Msunduzi Municipality: Spatial Planning And Land Use Management By-law* (2020).
1591 See "public facility" in s 1 of the Msunduzi SPLUM By-law.
1592 As set out in section 50 of the Msunduzi SPLUM By-law.
1593 See para 5.3.1.3 above.
1594 See s 18 of the Msunduzi SPLUM By-law.
1595 Sections 34-36 of the Msunduzi SPLUM By-law.
1596 Polokwane Local Municipality *Polokwane Local Municipality SDF 2024* 9.

23% urban and 71% rural settlements, with many of the smaller and dispersed rural settlements belonging to traditional authorities.[1597] This spatial pattern is reminiscent of the apartheid-era segregation. While the municipality does not own any land in the tribal authority's area of control, the development objectives and planning in this area often fall under the municipality's authority and regulations. The rest of the space is made up of small holdings, industrial and recreational land.[1598] This secondary city has a population of more than 843 400 people, it has a per annum population growth of 1.42%, and approximately 249 443 households.[1599] Between 2011 and 2022, their service delivery has gradually increased with regard to flushable toilets connected to sewerage systems,[1600] weekly refuse removal,[1601] in-house piped water,[1602] and electricity for lighting.[1603] Additionally, it is important to note that Polokwane Local Municipality's audit outcome shows that the municipality is "financially unqualified" for the 2021/2022 and 2022/2023 financial years.[1604]

[1597] Polokwane Local Municipality *Polokwane Local Municipality SDF 2024* 11-12; Polokwane Local Municipality *IDP 2024/2025* 71, 85.

[1598] Polokwane Local Municipality *IDP 2024/2025* 71-72.

[1599] Municipalities of South Africa 2024 https://municipalities.co.za/demographic/1121/polokwane-local-municipality. See also Good Governance Africa *Governance Performance Index – South Africa 2024* 19; Main *The Local Government Handbook: South Africa 2024* 128.

[1600] Flush toilet connected to sewage as a household service went from 38.6% (in 2011) to 40.4% (in 2016) and then to 48.3% (in 2022). See Municipalities of South Africa 2024 https://municipalities.co.za/demographic/1121/polokwane-local-municipality.

[1601] Refuse removal between 2011 and 2016 was more or less the same, with 38.9% and 38.8%, respectively, but shows an improvement of up to 46.5% in 2022. Municipalities of South Africa 2024 https://municipalities.co.za/demographic/1121/polokwane-local-municipality.

[1602] From 30.4% in 2011, the piped water inside dwellings as a household service declined to 26.3% in 2016 but has significantly improved to 41.4% in 2022. Municipalities of South Africa 2024 https://municipalities.co.za/demographic/1121/polokwane-local-municipality.

[1603] Electricity for lighting has increased from 83% in 2011 to 95% in 2022. Municipalities of South Africa 2024 https://municipalities.co.za/demographic/1121/polokwane-local-municipality.

[1604] A financial audit outcome of "Financially unqualified with findings" means that the financial statements contain no material misstatements, but findings have been raised on either reporting on predetermined objectives or non-compliance with legislation, or both these aspects. See AGSA date unknown https://mfma-2023.agsareports.co.za/pages/audit-101#audit-of-financial-statements.

Figure 5-3: Map of Polokwane Local Municipality[1605]

Polokwane is considered the economic hub of the Limpopo Province, comprising the CBD, industrial area, social services and well-established formal urban areas.[1606] The City of Polokwane consists of seven clusters, namely Mankweng,[1607] Moletjie,[1608]

[1605] Municipalities of South Africa 2024 https://municipalities.co.za/map/1121/polokwane-local-municipality.

[1606] Polokwane Local Municipality *IDP 2024/2025* 72.

[1607] This cluster constitutes a large area and is mixed formal and informal, located to the east of the city. This is also the cluster within which the University of Limpopo is located and is a long-established settlement area.

[1608] Like Maja, this cluster comprises an informal settlement area, with very limited services and infrastructure, and is located northeast of the City of Polokwane.

Molepo/Chuene/Maja,[1609] Sebayeng/Dikgale,[1610] Aganang,[1611] Seshego,[1612] and the City Clusters.[1613] According to the IDP of the municipality, the city struggles particularly with inadequate control over illegal land use practices within the city and a lack of human capital to deal with illegal land uses, while current land parcels of the municipality are not enough in terms of the projected 2060 urbanisation rate which might result in more unsustainable rural settlements.[1614]

In terms of its spatial planning, Polokwane faces challenges of spatial injustice and inequalities, inadequate rural land ownership, underutilised airport infrastructure, lack of alignment of municipal plans and implementation of its by-laws.[1615] In rural areas within Polokwane, despite having the potential for nodal development, there are informal settlements within road reserves and flood lines, uncoordinated spatial settlement, poor quality streets in informal settlements, unplanned land use types, unclear determination of property sizes, and so forth.[1616]

Interestingly, Polokwane Local Municipality used an outdated SDF from as far back as 2010, while the empirical research phase of this study was conducted, and only recently, in 2024, finalised and published the reviewed SDF in line with the SPLUMA, which was promulgated and enacted in 2015. The cause for the delay in reviewing the SDF as per the regulations in SPLUMA, the provision that SDFs must be reviewed and updated every five years, was not ascertained and was not part of the empirical research at hand. The municipality has developed and adopted a municipal planning

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1609 This cluster is located to the south and comprises a mainly informal settlement area, with limited services and infrastructure.

1610 30 km north-east of the city centre, this cluster is less formal and newer than Mankweng and is experiencing rapid growth.

1611 The seventh cluster that has been incorporated into Polokwane is a rural cluster with four Traditional Authorities, namely Moletji, Matlala, Maraba and Mashashane. The area is rural with no township.

1612 Situated west of the CBD, this cluster is the closest to the economic core of all the settlement areas and has the best access to the formal economy of Polokwane.

1613 Polokwane Local Municipality *IDP 2024/2025* 72.

1614 This arguably shows an absent "suitable built environment", "adequate basic services" and "coordinated government" – see paras 2.5.2, 2.5.5, and 2.5.6 above. See also Polokwane Local Municipality *IDP 2024/2025* 87.

1615 Reflecting again the lack of inclusion of the feature "coordinated government" – see para 2.5.6 above. Polokwane Local Municipality *IDP 2024/2025* 92.

1616 Polokwane Local Municipality *IDP 2024/2025* 95-96.

by-law in 2017, in line with section 32 of the SPLUMA, established a municipal planning tribunal, and has developed, adopted and proclaimed an integrated LUS (2022).

In terms of the climate profile of the city, Polokwane experiences mostly summer rainfall and warm temperatures with the average high temperatures of around 28°C, especially during December and January, and average winter temperatures of around 4 degrees.[1617] It has a mean precipitation of 478 mm annually.[1618] In the municipal territory, there are 19 catchment areas, with ten of these catchment areas being located inside the city boundaries. The catchment also contains several significant wetland habitats that are home to rare or endangered plant, bird, and frog species.[1619] Water in this area is mainly from boreholes extracting water to reservoirs and tanks within the city.[1620]

5.3.3.2 Examining the inclusion and recognition of features for urban climate resilience

Polokwane's SDF does make mention of the principle of spatial resilience as required by section 7 of SPLUMA and mentions the NDP directives in the context of the municipality. Although it only mentions resilience three times, with one reference mentioning climate resilience specifically,[1621] it does contain some of the features identified for urban climate resilience in Chapter two of the study.[1622] It envisions inclusive and integrated rural economic opportunities to contribute to the economic and social activities within the municipality[1623] and the increased demand for basic services,[1624] along with infrastructure development[1625] and employment creation.[1626] Furthermore, the SDF underscores the importance of integrating a holistic spatial

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1617 Polokwane Local Municipality *IDP 2024/2025* 337.
1618 Polokwane Local Municipality *IDP 2024/2025* 337.
1619 Polokwane Local Municipality *IDP 2024/2025* 338.
1620 Polokwane Local Municipality *IDP 2024/2025* 338.
1621 Polokwane Local Municipality *Polokwane Local Municipality SDF 2024* 60, 71, 83.
1622 See para 2.4 above.
1623 This can be linked to "LED and sustainable livelihoods" as well as "inclusive community structures and processes" – see paras 2.5.1 and 2.5.3 above.
1624 Which links to the feature of "adequate basic services" – see para 2.5.2 above.
1625 Linking back to the feature of a "suitable built environment" envisioned in para 2.5.5 above.
1626 Polokwane Local Municipality *Polokwane Local Municipality SDF 2024* 19.

development approach due to the dynamic interplay between sectors with the aim of balancing "economic growth with ecological preservation, cultural heritage, and climate resilience."[1627] The SDF also stipulates that any land use decisions "must consider factors such as environmental impact, economic benefits, community well-being, and sustainable resource management," which also reflects the features of urban climate resilience.[1628]

The Municipality also has a Polokwane Urban Renewal Strategy (URS) and CBD Development Plan (2016) aimed at urban management and maintenance;[1629] safety, security and by-law enforcement;[1630] local economic development;[1631] and social development,[1632] also indirectly promoting some of the features of urban climate resilience. However, this URS and CBD development plan does not speak to the natural environment or open spaces within the city and does not feature an environmental component.

Polokwane, according to its IDP section on urban development, has a tendency "to develop policies that demand integration of all resources and different directorate(s) to interact with one another" and "shift away from… future planning and concentrate on basic services rather (than) advance proactive plans" aimed at advancing service delivery mechanisms linked to urbanisation.[1633] This is contrary to what is needed for urban climate resilience.[1634] However, in order to achieve a sustainable urbanisation model, Polokwane Municipality, in its IDP, identifies the need to create its own Integrated Urban Framework Plan, which will proposedly include a detailed plan for the City Development Strategy (CDS). This anticipated CDS will be informed by the following important policy levers: integrated urban

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[1627] Polokwane Local Municipality *Polokwane Local Municipality SDF 2024* 71. This links with both the features "LED and sustainable livelihoods" and "nature-based urban planning" and the accompanying environmental context identified in Chapter two – see paras 2.5.1 and 2.5.4 above.

[1628] See para 2.5 above.

[1629] See paras 2.5.5 and 2.5.6 above.

[1630] See paras 2.5.2 and 2.5.6 above.

[1631] See para 2.5.1 above.

[1632] Polokwane Local Municipality *IDP 2024/2025* 84-85. See also para 2.5.3 above.

[1633] Polokwane Local Municipality *IDP 2024/2025* 96.

[1634] See para 2.5 above.

infrastructure,[1635] inclusive economic development,[1636] empowered active communities,[1637] effective urban governance,[1638] integrated transportation and mobility,[1639] integrated sustainable human settlements,[1640] integrated urban planning and management, and sustainable finances.[1641] All of these proposed policy levers link to the features of urban climate resilience as identified.[1642] On the one hand, the IDP reflects awareness that climate change is becoming increasingly apparent in Limpopo Province and is evidenced by the long-term changes in weather indicators, such as decreases in rainfall and increases in temperature and acknowledges that as a secondary city, Polokwane Municipality, has an important role to play in planning and implementing climate change mitigation strategies.[1643] It also indicates awareness of population and economic growth being drivers of climate change, along with the effect of the energy sector and carbon emissions from other sectors. On the other hand, however, the city does not have climate change response strategies or plans due to budgetary constraints.[1644]

The Municipality also experiences a range of environmental challenges, such as, amongst others, waste management, sinkholes, soil erosion, deforestation, overgrazing, invasive species, illegal sand mining and illegal dumping.[1645] The IDP does, however, distinguish some of the notable achievements of the Municipality with regard to the environmental challenges they experience.[1646] The City also

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1635 Which can be linked to the feature of a "suitable built environment" – see para 2.5.5 above.
1636 Reflecting the feature of "LED and sustainable livelihoods" – see para 2.5.1 above.
1637 Which could construe "inclusive community structures and processes" – see para 2.5.3 above.
1638 That is included under "coordinated government" in para 2.5.6 above.
1639 Included under "suitable built environment" – see para 2.5.5 above.
1640 This would arguably fall under the ambit of the features "LED and sustainable livelihoods" and "adequate basic services" – see paras 2.5.1 and 2.5.2 above.
1641 Polokwane Local Municipality *IDP 2024/2025* 97. See also para 2.5.6 above.
1642 See para 2.5 above.
1643 Polokwane Local Municipality *IDP 2024/2025* 343.
1644 At the time of writing this study, the most recent IDP of the city (2024/2025) reflected that they had engaged with the DFFE to assist in securing funding through Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and that GIZ was in the process of appointing a service provider to assist in development of such a plan.
1645 Polokwane Local Municipality *IDP 2024/2025* 344-346.
1646 Polokwane Local Municipality *IDP 2024/2025* 344-346. Some of these achievements are also addressed by participants during the interviews conducted as part of the empirical study, such as the National Arbor City Awards, improved maintenance of parks and environmental knowledge capacity building and participation in the Provincial Intervention Limpopo Green Schools competition. See para 5.4. below.

established the Polokwane Environmental Forum with the aim of addressing the environmental challenges in a coordinated manner and participates as an active member at the district level as well as in the Capricorn District Environmental Forum.[1647]

5.3.3.3 Spatial Planning and Land Use Management By-law

The Polokwane SPLUM By-law in effect at the time of the interviews was developed in 2017. It was noted that the by-law was scheduled for review in the following year (2023), making 2022 its final year of application. It has since been reviewed with the newest available version being promulgated in 2024.[1648] This SPLUM By-law goes further than both Emfuleni and Msunduzi's SPLUM By-laws as it contains both a long title and preamble, and it distinguishes between private[1649] and public[1650] open space in section 1. Furthermore, it has a comprehensive chapter for LUS, [1651] as well as specific parts in chapter four that deal with the institutional structure for land development and land use management decisions, which include the provisions pertaining to the MPT.[1652] Polokwane has a clearly organised and comprehensive

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[1647] Polokwane Local Municipality *IDP 2024/2025* 346-347.

[1648] See Polokwane Local Municipality *Polokwane Municipal Planning By-Law* (2024) (Polokwane SPLUM By-law).

[1649] "Private open space" means in relation to a land area, a portion set aside or to be set aside in a scheduled open space, for the use by a community as a recreational area, primarily intended for outdoor living activities which enjoys a reasonable amount of privacy. The use of private open space should be included in the conditions of establishment and title and approved in terms of the provisions of this Bylaw. See s 1 of the Polokwane SPLUM By-law.

[1650] "public open space "means any open or enclosed place, park, street, road or thoroughfare or other similar area of land shown on a general plan or diagram which is for use and benefit by the general public and is owned by or vest in the ownership of a Municipal Council and includes a public open space and a servitude for any similar purpose in favour of the general public as contemplated in SPLUMA. See s 1 of the Polokwane SPLUM By-law.

[1651] Providing for general provisions, purpose of, preparation and Council approval for publication of the draft LUS, institutional framework for preparation, review or amendment of LUS, public participation, incorporation of relevant comments, preparation, submission to council for approval and adoption, publication of notice of adoption and approval, submission to Member of Executive Council, records, contents, register of amendments, and merging of LUS. See ss 16-31 of the Polokwane SPLUM By-law.

[1652] Part 1 (ss 32-33) dealing with Land Development Application Categories, part two (ss 34-35) dealing with the functions and powers of the MPT and Authorised Officials, part three (ss 36-47) dealing specifically with the establishment and procedures for MPTs, part four (ss 48-49) providing for the decisions of the MPT, and part five (s 50) for administrative arrangements of the MPT. See chapter 4 of the Polokwane SPLUM By-law.

chapter on development management.[1653] The Polokwane SPLUM By-law provides more detail on engineering services than Emfuleni's and Msunduzi's do.

5.4 Participant responses

The following section provides an overview of the questions and general responses derived from the 11 semi-structured interviews conducted with municipal officials in the land use management, spatial planning, environmental management and legal services departments in the local municipalities of Emfuleni, Msunduzi, and Polokwane.[1654] The responses recorded here are directly derived from the interview feedback from the participants on:

- the job requirements (or expertise required for the position) and adequacy or inadequacy of any training or support to municipal officials to perform their duties;

- the duty or responsibility (as understood by the participants) of the municipality to respond to the effects of climate change (and urban climate resilience - as had to be explained);

- the municipalities' legislative and executive authority to contribute to the national effort to address climate change and how they understand this authority and see it being relevant for urban climate resilience;

- use and knowledge of governing tools (for example, local environmental governance tools such as command-and-control instruments (by-laws or law-enforcement), incentive-based instruments, agreement-based instruments, or civil-based instruments) to address the impacts of climate change, and which they think would be most effective to promote urban climate resilience;

[1653] Consisting of different parts dealing with types of applications, establishment or extensions of township boundaries, rezoning, restrictive conditions of titles, amendment or cancellation of a general township plan, subdivision or consolidations, permanent closure of a public place, consent use, land use on communal land or in rural areas, departure from provisions in the LUS, and other general matters. See ss 51-86 of the Polokwane SPLUM By-law.

[1654] The questionnaire is attached as Annexure A below.

- knowledge on SPLUM by-laws and their use for promoting urban climate resilience as far as it pertains to the features of urban climate resilience as identified in Chapter two of the study;

- their involvement in the formulation or drafting of a spatial planning and land use management by-law, including responsibilities and considerations in the drafting of the by-law;

- specific requirements for SPLUM by-laws in terms of the SPLUMA;

- whether municipalities have a discretion in terms of what to include in their municipal by-laws and whether they would recommend any amendments to the current SPLUM by-laws, or whether a separate by-law(s) may have to be drafted and implemented for urban climate resilience; and

- the working relationship between the municipal officials and councillors responsible for drafting and adopting the spatial planning and land use management by-law as well as other stakeholders/expertise.

The responses are presented as a general discussion grouped under each of the sections below and consist of the answers to one or, in some instances, more of the questions asked.[1655] To uphold the anonymity of and respect the confidentiality of participants who have agreed to participate, the participants are referred to as "participant" and allocated a letter of the alphabet, such as "participant A" and instead of gendered pronouns, the pronouns "they/them" will be used to further protect the confidentiality of the participants. The municipalities are ascribed a numerical value between 1 and 3. As such, the participants are grouped as follows: Participant A, B, C, and D (Municipality 1), Participant E, F, G, and H (Municipality 2), and Participant I, J, and K (Municipality 3). As stated previously, all participants are situated in departments, portfolios or business units (depending on which municipality) and these relate directly or indirectly to planning, spatial planning or land use management, by-laws, legal services, or environmental management.

[1655] The questionnaire is included as "Annexure A" below.

5.4.1 Training and work experience

In this section, participants were asked whether they had received any training (either formal tertiary training or qualification, degree, certificate, diploma, or any informal training from within or outside the municipality) to perform their duties in their particular portfolio, business unit, or department within their municipality. All the participants responded in a manner that firstly addressed their qualifications, expertise and experience in the relevant municipality and for the particular position in which they are appointed. All the participants have tertiary qualifications and have listed these qualifications as requisites for being appointed in their capacities. Several were also pursuing postgraduate degrees or had completed such. Many of the participants also have diplomas or certificates for short courses completed as advancement in knowledge and expertise, and include, amongst others, environmental management, GIS, legislative drafting, project planning, and human resources management. Four out of 11 Participants also mentioned their involvement with forums (such as the Planners' Forum, SALGA, the South African Council for Planners (SACPLAN), and the National Climate Resilience Forum led by the DFFE, all of which are professional forums where trending issues are discussed, knowledge dissemination occurs trough presentations, or even workshops are held for building continuous professional development), tribunals and committees (such as the MPT) or the professional and legislative authorities/bodies (such as the Appeal Authorities in municipalities) that inform knowledge and experience.

Four out of the 11 participants indicated instances of training received, with two of them indicating training or workshops related to SDFs or planning in particular.[1656] Seven of the 11 participants indicated that they had to adopt a learn-as-you-go approach. One of the 11 participants responded that while no formal training is provided by the municipality, they have joined and attended a wide range of climate change seminars, webinars, and workshops from all over the world as they came

[1656] Participants C, J, I, K. With Participants C and J indicating training in relation to planning specifically.

up over the years and as they have become aware of such training opportunities.[1657] The other six participants indicated that no formal training was received from within the municipality or externally. Participant F, however, mentioned what they considered a "mentorship" from a colleague in the department who had extensive experience and, in a way, mentored them and trained them in the loose sense of the word and that they are "a hands-on person" and like learning, so they ended up developing a keen interest in town planning, though they have not done any course or form of training on it.[1658] Additionally, Participant E stated that, "compared to this Municipality, I had more exposure to training that side [at a previous municipality where they were employed] than here."[1659] Participant G responded that they did not receive training within the Municipality, but that they had gained experience and knowledge that equipped them for their position, in the private sector where they worked as an intern and stated that,

> That's where I accumulated most of my experience within the land use management section, as well as spatial planning, because that was a private sector which was dealing with land development applications, statutory applications, as well as reviewing of spatial development frameworks.[1660]

Participants A, B, and D all indicated that no training was provided, and all three indicated that their tertiary education informed most of their knowledge and indicated it as prerequisites for their jobs and duties, but that they relied on experience and those backgrounds to inform their work. Participant A also considered their background knowledge, experience, and skills, such as drafting skills, checking for legislative compliance and legality, acquired as a legal practitioner, to constitute adequate training for them to fulfil their duties as is expected of them in their position at the Municipality. Both Participant B and D highlighted the lack of training as it relates to by-laws and SPLUMA and the vast

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[1657] Participant H. It was not clear if these workshops and seminars were compulsory or voluntary, but from the context it appears to have been on the Participant's own volition and initiative that they attended such workshops to improve their knowledge – the participant did indicate that they attended workshops as it came up and they (the Participant) became aware of such training opportunities.

[1658] Based on this response, it is not clear whether such training is provided through the municipality or whether the participant is merely referring to external courses.

[1659] Brackets added for contextual background and clarity purposes.

[1660] Participant G.

difference between SPLUMA and the Ordinance System[1661] that was used prior to the enactment of SPLUMA. Participant B's response illustrated a keen interest in training relating to land use management and spatial planning, environmental and legal aspects, and answered that

> On the by-laws…uhm…We haven't received training. We received information from Gauteng Province, but it was information. We requested from them that we want training, specifically on our by-laws, and … it would have been scheduled. I think the budget lapsed.[1662]

Additionally, Participant B indicated that training is important, as they have new by-laws (at the time of the interview in 2022 they indicated it was a 2018 by-law) and that they "are still not complying due to lack of knowledge, due to ignorance, due to doing it the old way", especially as it was their first time working with such by-laws since the enactment of SPLUMA in 2015.[1663]

In the same vein, Participant D held that in the past it was expected that the Municipality provide, "facilitate and allow for the training within the institution itself".[1664] Their reasoning related to the changes that SPLUMA brought to the forefront and explained it as follows:

> Training wise, let's say for instance, for the first time the appeal authority or what was then the township board was under SPLUMA dedicated to the actual municipality or local government to also facilitate that… because of planning being one of your functional competencies of… of local government, so, in the past, you know, you had the townships board, where now you've got the Appeal Authority, so, therefore, local government or this municipality has to redraft the whole script of what is going to be anticipated under the function of the appeal authority, so, when I started with the implementation of SPLUMA, it was up to us to look at the legislation and to implement a mechanism or a functioning entity that will allow for these duties to be facilitated.[1665]

Two out of the 11 participants also indicated having experience as inspectors within their particular units, with Participant K being a qualified Environmental

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1661 See generally Van Wyk *Planning Law* 61.
1662 Participant B.
1663 Participant B.
1664 Participant D.
1665 Participant D.

Management Inspector (EMI)[1666] and Participant G having been a town planning inspector pre-SPLUMA.

5.4.2 Duty or responsibility to respond to the effects of climate change and urban climate resilience

This section is related to the knowledge and opinions of participants on whether they think the Municipality (and their department) has a duty and/or responsibility to respond to the effects of climate change and urban climate resilience. The entire group of 11 participants agreed that the Municipality has such a duty or responsibility. Participant A commented that this does not just need to occur through by-laws but that through the proper performance of functions (such as electricity, control of air pollution, human settlement, amongst others) and proper management of those functions, the Municipality stands to "also do a lot in terms of… I think we will make a valuable contribution towards climate change and resilience."[1667]

Participant B went into greater detail by providing examples of ways in which they felt the Municipality and their department can respond to climate change and resilience. While they concurred, they did, however, opine that while the Municipality can play a huge role in climate resilience,

> I think the drive should come from environmental management, because they've got the know-how, and the knowledge, they are specialists. So, they should come and tell us…[1668]

They further, suggested that the environmental department should take the initiative and propose certain measures that can benefit the participant's department

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[1666] Environmental Management Inspectors (EMIs) are empowered by ss 31B and 31C of NEMA and appointed by either the Minister responsible for Environmental Affairs, Water Affairs, or Mineral Resources, or by an MEC. Their mandate, as outlined in s 31D, includes monitoring and enforcing compliance with environmental legislation. EMIs are, therefore, also authorised to inspect properties, review documents, question individuals, and investigate actions that may breach environmental laws or permit conditions (see also s 31G). They can take samples, photographs, and issue instructions to prevent or address environmental harm. They must act in accordance with prescribed protocols and minimise harm to properties or objects involved in their investigations (see s 31H for more detail).

[1667] Participant A.

[1668] Participant B.

and other departments with new township establishments, RDP housing, solar power and energy, helping the community, encourage planting more trees in developments, having runoff friendly sidewalks with indigenous plants, like succulents so that the runoff doesn't go directly into the street and gets time to absorb into the soil, among a range of other examples.[1669] The participant emphasised that there is great potential. Participant B also showed knowledge not only in terms of some of the potential ways in which the Municipality can respond to climate change and resilience, but also about the international and national legislation triggering such a duty and responsibility. They, however, acknowledged that by-laws can also play a role in fulfilling the duty mentioned in this section, but they seemed hesitant to assert that the spatial planning and land use management by-law, in particular, can play a role past helping with land uses and zoning for purposes of preservation of open space systems and conservation purposes, and taking cognisance of any of the environmental management instruments in terms of environmental legislation. Participant B also likened a land use scheme to a by-law in the sense that these are both enforceable instruments that must be complied with. The participant also asserted that the LUS provisions for environmental zones are "limited" and do not assist enough and "do not consider the bigger picture."[1670] In the end of their response they, however, conceded that the Municipality has the tools, but asserted that they doubt the Municipality's adherence to these tools and stated "I don't want to shift the blame, but that's where our environmental management [department comes in] - because they also see the documents."[1671]

Participant C elaborated on their affirmative response that municipalities do indeed have such duty, by stating

> I think municipalities, if we were to be truthful, they are the first people to respond to climate change issues when it comes to resilience in cities, because town planning deals with the establishment of cities and towns. And, therefore, we are directly involved. Planning is directly involved because we plan those cities, we manage them.[1672]

[1669] Participant B.
[1670] Participant B.
[1671] Participant B. Brackets added for context and clarity in the response.
[1672] Participant C.

Participant C went further in emphasising the importance of town planners being familiar with and understanding emerging concepts such as climate change resilience, as the older planners among them might not have had initial training with such concepts. The participant further stated that "It's something that anyone in any profession cannot ignore… it is something we have to learn."[1673] Participant C established that the Municipality is directly involved through their management by-laws and SDFs based on the legislative framework that guides municipalities, keeps all instruments aligned, and considers a range of sectors.[1674] The participant placed significant emphasis on the importance and role of the SDF and the use thereof in some of the Municipality's projects.

Participant D argued that with the competency associated with planning, and various other branches, be it from an environmental side or from a climate change and resilience perspective, the emphasis is and should be placed on local government and their independence relating thereto. They stated that

> if we are not going to take on these responsibilities that are forthcoming or flowing from our specific competencies, then we are bound to fail because this is where we implement, this is where governance either succeed or don't succeed.[1675]

Participant E touched on some of the points that were also present in the responses of other participants, and maintained in their response:

> I think municipalities do have duties because when disasters happen, they happen at a local level, and they are required to respond to that. It's their people who are displaced. They are the ones who should be and who are expected to provide support. And it's their cities, their infrastructure that is disrupted by all of these things that happen.[1676]

[1673] Participant C.

[1674] "We look at the legislation that guides us, so everything else that we plan must be aligned to the legislation. Then we look at the socioeconomic, the socioeconomic demographic, the population, the education, and age profile; then we go on to the economic overview; then we look at the transport systems. Then from transport we go to the natural environment, then the broad land use, like housing. Those are the main broad things that we look at, and they are all aligned to cities." Participant C.

[1675] Participant D.

[1676] Participant E.

Another seemingly important point that Participant E made is the cost of investing in infrastructure and building capacity within the Municipality.

In a rather complex and winding discussion with Participant F, they indicated that the Municipality had things in place and takes their duty very seriously. They explained that when a point of contention arises between different specialised departments in the Municipality regarding comments on proposed development as part of their circulation method, they will visit the site together and inspect the site to confirm or deny the point of contention and will then amend their comments or leave it to the particular department to take a decision. Participant F also underscored the importance of enforcement of all sectors' application requirements, compliance or contravention notices and authorisations in terms of a proposed development and shared that they, as a municipality, have taken a conscious decision to include schedules of fines and sanctions that may be instituted in the case of non-compliance into their by-laws. They stated, "'We're taking it serious. Inasmuch as it is a revenue-generating exercise, it is also an enforcing exercise."[1677] The participant also showed awareness of the need for and importance of open space systems and wetland, and recreational areas. Furthermore, they also touched on the notion that different sector departments should not be working in silos if positive development is the goal, and extended this to vertical cooperation with national and provincial departments. Participant F also highlighted the role and duty of the MPTs in development applications and that comments received during circulation inform an important part of the decision-making, and that municipal officials are expected to commit and give proper comments so that such committees or tribunals can make informed decisions. They stressed also that the municipal officials have the technical know-how and, as such, have a duty to advise councillors or developers correctly and to take responsibility for their own mistakes. It is the by-laws and instruments of the Municipality, drafted by its officials, regulating the processes and guiding compliance with other legislation, such as NEMA and the SEMAs and the enforcement thereof that determine development outcomes.

[1677] Participant F.

Participant G placed the focus of this duty and responsibility on the importance of protecting the natural environment of the city, which means adhering to environmental legislation requirements. Participant G also contended that there is a need for an environmental by-law to

> guide the environmental authorization or environmental development within the city or environmental itself and that it is put in that way and ensure that all the national species are well taken care of in accordance with that particular legislation.

The participant, much like participant B, seemed not to want to shift the blame. Participant G, however, acknowledged that they are uncertain about the status quo of the environmental department's work, by-laws and implementation of environmental legislation or adherence thereto. They went further in expressing that, aside from this uncertainty, they were convinced that by-laws do play an important role in the duty of the Municipality, as these are easily implementable and enforceable instruments, as they have legal effect. The participants also mentioned several sectors that influence urban climate resilience and the interconnected nature of these sectors. Similar to Participant F, Participant G's response contained reference to the trouble with departments operating in silos and also recommended working together to find an amicable solution that suits both departments. Nevertheless, the participant held that land use cannot interfere with matters dealing with or dependent on other legislation. The phrasing that Participant G used in that assertion seems contradictory to what the participant's meaning was in the response that they continued with:

> As much as our by-laws do emphasise that upon assessment of each land use development planning applications, we must ensure that there is full compliance with environment… with other, you know, relevant legislation, such as NEMA, we must ensure that environmental authorisation is acquired. However, the relevant departments need to play their role in enforcing such, and you know, ensuring that the implementation of that particular clause is in place.[1678]

It seems that what the participant attempted to convey was that, irrespective of whether their department has such a duty, every other department also has such a duty.

[1678] Participant G.

Participant H linked the duty of municipalities to the nationally determined contributions (NDCs) of municipalities, including at the local level, as they "feel that each municipality has the responsibility to definitely respond to climate change".[1679] The participant also observed that climate change is slowly becoming more prominent as people gain a better understanding, especially after the floods and other occurrences in the KZN province, for example. The participant indicated that they had received inquiries and observed an increased interest in the climate change work they have been doing. The participant indicated the commitment of their department to realise this duty through attempting to obtain external funding for the implementation of the projects that they are working on, as they do not receive adequate funding from the state or municipal coffers. Participant H highlighted the Municipality's climate change policy and its climate adaptation and mitigation strategy developed by their department. The participant mentioned that they have difficulty implementing these documents as part of their duty, as these were not legally enforceable. The participant also indicated that they had no enforceable instruments as

> The legal department determined that it would not be feasible to have a by-law specifically for environmental management, and it was better to green other existing by-laws.[1680]

This leaves them with the option of adding sections pertaining to the environment and climate change in a range of other existing by-laws and request other departments to make note of the policy documents of the Municipality, to ensure that developers also peruse those and take them into consideration when planning a development. The policy document was also held to be very detailed, and the participant indicated that there are measures or actions for each business unit within the Municipality to implement.

Participant I considered that the duty to respond to the effects of climate change and urban climate resilience should be exercised as a proactive or pre-emptive consideration instead of what they consider to be a trend, of attempting to correct

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[1679] Participant H.
[1680] Participant H.

things after the fact, i.e., reactively responding. They stated that "it should happen post-planning so that you don't have to address any climate change issues,"[1681] and as such, "before the implementation of any development within the city."[1682]

Participant J offered both a general and land use perspective in their response, both of which affirm the duty of municipalities as discussed above. They stated that the Municipality does

> have a responsibility on climate change and, in general, obviously, I would think it will be more about drafting the correct legislation or by-laws or policies relating to climate change and addressing the issues that we have.[1683]

From a land use perspective, Participant J stated that the duty entails considering the type of development applications that they receive and then considering the supporting documents in terms of environmental authorisations or any other additional environmental studies that would be required for bigger developments.

Participant K had similar comments on the lack of budget to give effect to the duty imposed on them. The participant summarised their duty in stating,

> Our role to play in the local sphere of government is to advise them in terms of planning, and how to plan in an amicable manner and also a sustainable manner.[1684]

Participant K went further and expressed a need for policy guiding documents that "advises of the by-laws, the strategy, and all those policies and the plans that are in place". The budgetary restrictions were mentioned again in relation to the proposed policies, which Participant K held cannot be done internally, and as such required funding to hire a consultant or expertise from institutions of higher learning, who are experts in the particular field, to develop the policy or by-law. The participant provided that in order to be considered for budget allocation, they have to compile proposals so that they can determine if a budget allocation may be made for the development of such instruments. Despite such setbacks, the participant

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[1681] Participant I.
[1682] Participant I.
[1683] Participant J.
[1684] Participant K.

went on to praise the forums that they are a part of, as they allowed them the opportunity to receive funding for the development of the resilient plan, where focus would be on vulnerability and risk around the Municipality. The proposed policy would arguably assist the Municipality to have something in writing to state the position of the Municipality with regard to climate resilience and climate change. Participant K confirmed that they "are duty-bound as the Municipality and also the municipal officials to respond to the effects of climate change".[1685]

5.4.3 Legislative and executive authority to contribute to the national effort to address climate change

Participant A described the legislative and executive authority as being authorised to make law at a municipal level, i.e., by-laws, in respect of the things that fall within their mandate and "that power, that legislative and executive authority is in the Constitution."[1686] The participant indicated further that it is not voluntary, and they have to comply with this mandate. The participant believed that with relevant laws, municipalities could have an impact in terms of climate change, however, they expressed that the legislative and executive authority is difficult to manage and that the timeframes connected to developing, proposing and enacting a by-law as part of the legislative authority of the Municipality take too long. The participant pointed out that the issue was with the internal processes of the Municipality when it came to exercising that legislative authority, and that it delayed the movement of the by-law to a phase where it could be implemented and enforced. Participant A highlighted that

> it's not moving because, in terms of our internal processes, it has to go to certain committees before it can be published and become a by-law. So, it's still a draft for now, until it's approved by the last committee, which is our Council, it won't be implemented. It will remain being a draft and we can't enforce it or implement it. So, we are doing our part. I'm doing my part in terms of drafting, which is our legislative and executive function in terms of the Constitution, but because of the processes internally there is no move.

[1685] Participant K.
[1686] Participant A.

The participant elaborated that the by-laws get stuck, not with the administration side of the Municipality, but with the political side and council committees. They mentioned 3 committees, namely Section 80, the executive committee (Exco), and lastly council. The participant explained that a by-law has to go through all three of these committees and only once it's approved by council, can they publish it for public comment, and enact it on the day of publication. The participant attributed most of the delay to the lack of knowledge on by-laws and that councillors would demand training or a workshop on the proposed by-law, which participant A explained happens with every committee and that there is no clarity on when, by whom, and where such a workshop would be hosted. The participant further provided that the change of councillors after their five-year term in office, and the constant replacement of councillors, make it even more difficult, as every time there was a change in leadership, they had to start the whole process over. The participant also expressed their frustration with this and contended that while the process of enactment is delayed, they had no power as the problem or challenge that the by-law was meant to address only gets further out of hand.

Participant B, though not fully familiar with the national commitments to address or respond to climate change, acknowledged that there are commitments, and referred to documents such as conventions and treaties in an earlier question, but they stated that they are not sure of the contents of these commitments, and further that they thought the pressure or enforcement to comply with and contribute to these national commitments needed to happen from the top-down, so that they could become more aware of what the commitments entail. Additionally, they expressed frustration with trying to achieve tasks from the bottom-up and used the example of ageing or aged sewerage network infrastructure that the provincial government department wanted to spend a lot of money on to upgrade, whereas the participant argued that newer technologies and systems exist, and that they ought to rather consider a new sewerage plant with new systems and technologies. The participant also mentioned that other countries have a lot of things they can learn from and that such countries can potentially even assist municipalities in developing countries. However, the participant stated that "if it doesn't come from

the top, it will not come from the bottom... especially in secondary municipalities with no money."[1687]

Participant C expressed their satisfaction with the way in which the Municipality is exercising its legislative authority and stated that they "think we are on point as a municipality",[1688] as the legislation governing municipalities is clear, straightforward and being refined annually. The participant elaborated on the revision of its policies and pertinently mentioned that they are inclusive, are not merely desktop-based studies, and that the Municipality engages the people and consults with them to determine what it is that they want or need before incorporating this into its planning documents. This indicates a bottom-up approach to planning within the Municipality. The participant also indicated knowledge of the applicable legislation and policies that must be considered in their planning documents and how they should be aligned with such national and provincial legislation and policies. While the participant gave a very extensive response to the second part of the question posed (in relation to the executive authority of municipalities in relation to national commitments), it is apparent that the participant misunderstood the question and what it was aimed at evaluating. However, the participant did level some criticism against the executive and management of the Municipality and the many challenges prevalent in the Municipality relating to implementation issues, budgeting, lacking human and skills capacity, cadre deployment, political interference, lack of adequate qualifications or knowledge at managerial level, corruption, mishandling of finances, instability of leadership, delays and impediments to project completion, undue political influence to benefit relatives or friends, delays and impacts on applicants that followed due process, attempts to manipulate results of inquiries, low morale and lack of incentives and recognition, insufficient compensation, and a performance management system that is not fit for purpose in relation to their departmental nature and that is open to abuse. The participant stated that there is a disjuncture between administrative officials and political office bearers.

[1687] Participant B.
[1688] Participant C.

Participant D addressed the question by starting their response with:

> as urban resilience is concerned, and specifically, from a legislative perspective, local government being allowed to create and pass their own pieces of legislation in the form of by-laws, gives them this tool and I want to say that this is mostly underutilised at the local government level.[1689]

The participant then indicated that the original understanding from a local government perspective was only "regarding municipalities as service delivery vehicles or being responsible for basic services"[1690] but that having the necessary powers to legislate and to function optimally in terms of the designated competencies allows municipalities to also contribute on a functional level to aspects like urban resilience and environmental aspects, and planning aspects, and everything associated with it. The participant also alluded that the SPLUMA by-laws did not necessarily only dictate the planning rationale and aspects thereto, but that there were overflows in terms of aspects of environment, meaning that a municipality is then allowed to make its own contribution in regulating certain environmental practices within the planning sphere, and extended this to urban resilience.

Participant E only touched on performance management aspects in relation to the targets of the department and whether they achieved said targets. The participant also indicated that if targets were not achieved, reasons had to be provided and information had to be shared with other spheres of government to determine the progress or contributions of the Municipality, whether it was line with the Municipality's vision, and to help the other spheres of government to identify possible interventions. The participant made no mention of the executive authority as stated in the question, nor specific national efforts or commitments in respect of climate change. Participant E also did not elaborate on the by-law or policy drafting in terms of the legislative authority of the Municipality.

Participant F indicated that one of the biggest contributions the Municipality could make with respect to the local community is to educate citizens on the content of

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[1689] Participant D.
[1690] Participant D.

the by-laws. Furthermore, the participant placed particular emphasis on the enforcement of the laws of the Municipality, and that the municipality should be strict in terms of compliance. The participant further underscored the importance of working with other government departments and other spheres of government.

Participant G reiterated their response to a previous question and stated that the adoption of relevant and appropriate by-laws, and ensuring compliance with such by-laws through enforcement, was the only way in which the Municipality could contribute to the national commitments. The participant acknowledged that the Municipality has legislation that prescribes what the Municipality should do in its municipal area in terms of addressing environmental issues and how to respond to such issues to be more inclusive of the local context and the Municipality's unique dynamics. The participant also held that, when drafting such local by-laws or policy, they be mindful that such documents are user-friendly and relevant to the city.

Participant H indicated a dire need for funding for the implementation of projects in the Municipality. The participant held that it was difficult to obtain funding when calls for interest for projects were opened, as the Municipality gets rejected immediately due to it being under administration. This is problematic as no funds are available, and prior funding was taken for things that were considered a higher priority. The participant expressed hope that the new Climate Change Bill[1691] and the Climate Change Policy or by-law would have stricter conditions for the Municipality to implement certain projects without fear that funding will be reallocated.

Participant I was hesitant to answer questions based on infrastructure and wished to focus more on planning aspects. The participant indicated that when development applications were considered, they required certain studies or assessments to be submitted along with the application. Some of the studies that the participant mentioned included a land certificate, an EIA, flood line certificates, or environmental reports that had been done prior to submitting the application.

[1691] Now the *Climate Change Act* 22 of 2024. At the time of the interviews, it was still the Climate Change Bill [B9-2022] as it had not yet been enacted at that time.

The participant further stated that the Municipality had issues with land invasions. These illegal settlers invading on property did not follow proper planning procedures. Participant I explained that it becomes a serious challenge of containing people and stopping them from invading land.

> When it comes to the invasion part, we struggle very much because then we can't address the climate part [concerns]. So, they will settle on land and build infrastructure that is immovable structures, so not shacks, they build massive houses and three or four years down the line, they will request the Municipality to assist with services.[1692]

The participant held that in order for services to be provided in a township, they will also require certain studies, among which a flood line certificate, as they do not want to put pipes where there is a flood line, as there will be blockages and disruptions of services. According to the participant, this poses a serious challenge to the Municipality beyond climate change, as the Municipality does not have much land available to them for moving invaders.

Participant J provided that the Municipality takes part in national or provincial initiatives such as the Arbor City Awards, which relate to tree-planting. The participant indicated that the national government has broad legislation that municipalities are required to fine-tune for their own policies and by-laws to reflect the local circumstances, as the national legislation cannot provide for the specifics of every city. The participant explained that the Municipality must take into consideration the fact that they have their own challenges in respect of climate change that will differ from city to city, meaning that in the broader framework of national legislation, municipalities have the responsibility to develop their own policies and by-laws.

Participant K stated that the municipality operates and implements its policy on land controlled by locals and that the legislative authority, in terms of policy and by-lawmaking, must be guided by national and provincial legislation. The Municipality also must cascade it down to fit the municipal circumstances. Participant K also mentioned the importance of awareness and education in the community and

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[1692] Participant I.

explaining to them in layman's terms why they are not in compliance or that what they are doing is considered illegal.

5.4.4 Use and knowledge of governing tools

Participant A indicated at first that they could not think of any and requested that we return to the question at a later stage. Later in the conversation, the participant alluded to promoting awareness "that there is this by-law"[1693] and providing education or information to citizens in the community, and they likened it to the campaigns surrounding the dos and don'ts during COVID-19. Participant A also, throughout the discussion, alluded to the use and efficacy of by-laws and the need for enforcement and implementation thereof, indicating that while they do not necessarily know these LEG instruments by name, they do have some foundational knowledge on the instruments within each category. In addition, the participant also referred to human resources and finances.

After contemplation on the question, participant B provided that the incentives and disincentives would work, however, they identified a potential challenge with these instruments and noted that enforcement might be challenging, as these instruments needed to be enforced to ensure compliance and noted that they were uncertain about how effective this would be. The participant then conceded that agreement-based instruments could also work, but reflected that such an agreement would have to have a strong environmental party or province but that they weren't aware of such agreements within the Municipality and questioned their efficiency, especially if agreements are made that undermine the purpose of such instruments.[1694] In terms of community-based instruments, they stated that it could definitely prove effective, but that, while an NGO or civil rights group are taking council to court in many cases, nothing happens, so it is doubtful that such an

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[1693] Participant A.

[1694] The participant alluded to having an agreement with a big corporation in which the corporation would do something small for the community such as fixing roads, for example, and in exchange the municipality would not be as strict with the compliance measures or "would look the other way" for transgressions, meaning that the agreement defeats the purpose of LEG instruments and sustainable development.

instrument would prove to be the most effective. Finally, participant B stated that command-and-control instruments and law enforcement, particularly, would be the most effective "because that's law. That will help if we have it, but if we don't have it… that's the only thing".[1695] They also named incentive-based instruments as a contender for efficiency.

Participant C wanted to address each LEG instrument separately, further affirming that the phrasing of the question might have been a challenge. According to Participant C, command-and-control instruments (or by-laws) are where the Municipality has the most control, and they are intimately connected to engagement with the community through public participation, and which, to an extent, also touches on the municipal duty to advertise and create awareness on these instruments. The participant also linked the participation to accountability or oversight from the community's side to monitor the Municipality so they don't allow hazardous developments that can harm the environment within which the community lives. They go further in mentioning law enforcement procedures for transgressions and indicate that there is a system of fines in place, but that unfortunately, this is not effective as the "law enforcement unit is in dire straits".[1696] In the opinion of the participant, the law enforcement unit requires around 15 enforcement officers, where they currently only have two, and this unit is also under-resourced. The participant indicated that the system is flawed and the penalty or fine is not sufficient, as it is too low to dissuade transgressors. The participant then stated that bribery of enforcement officers is rampant in the city and categorises the enforcement aspect of the by-law "completely dysfunctional and renders the system null and void."[1697] In addition to this statement, the participant said "you cannot plan and not have enforcement; it goes hand in hand".[1698] When addressing the incentive-based instruments, the participant indicated that the Municipality does have incentives in place, in an attempt to attract developers back into the CBD area as part of their urban renewal strategy and to address the problem

[1695] Participant B.
[1696] Participant C.
[1697] Participant C.
[1698] Participant C.

of derelict buildings and restoring them. In order to encourage such development, the participant alluded to tax exemptions or reductions. Additionally, they mentioned initiatives for which incentives could be beneficial, such as green development, establishing a CID, and creating NMT networks and systems, like bicycle lanes, for example, to create an inclusive city. They stated that, incentive-wise and planning-wise, the Municipality was strong, but that it once again came down to implementation being insufficient. In relation to agreement-based instruments, Participant C expressed that the Municipality used to have such engagements where they would ensure that the community was involved from the beginning of a project all the way through to the implementation stage. The participant shared that such agreements for developments were being made and partnerships formed between the Municipality, stakeholders, and the community to deliver projects, but that it has since been interrupted by COVID-19 and has not taken off again. In terms of formulation of plans, by-laws, and general day-to-day planning the participant noted that they have a process where they engage the stakeholders through newspaper adverts, the radio, and municipal websites, on which they advertise and invite comments in accordance with the procedures and timeframes set out in SPLUMA, after which those comments are taken into consideration. They indicated that the Municipality has platforms where they go to the community, for example, a school, and present to and engage the residents. Despite this, the participant stated that the Municipality does "have partnerships, but they are not strong. Some of the people just don't come."[1699] They then stated that the civil-based instruments or engagements were weak in their opinion and that while they used to have awareness campaigns and pamphlets, they no longer have much of that.

Participant D stated that the LEG instruments mentioned can address the impact of climate change. They also held that the use of these instruments or tools would allow one to create awareness as they allow people to become more aware of aspects like the environment, urban resilience and everything associated with it.

[1699] Participant C.

They argued that this is the case because once taken up in these instruments or mechanisms, it becomes easier for people to understand these aspects because they are regulated. From a legal perspective, the participant expressed a preference for command-and-control instruments and believes these instruments to be the most effective as it

> comes down to the rule of law aspect because if you don't observe and enforce and make sure that there's specific consequences for a person's actions, then you will not get anywhere. You will not see a functional society.[1700]

The participant stated that the moment that command-and-control, including its enforcement, falls short, and even the legislative nature thereof will fail, and it stays a mere document that "will never flow through into practice to breed that type of behaviour associated with that."[1701] They argued that, from a legislative perspective, and dealing with the aspect of enforcement, it came down to competence, passion and willpower in that you need someone passionate about the actual enforcement, who understands the law, and is willing to put in the work. The participant elaborated on the processes required for enforcement and explained that

> when it gets to the non-compliance thereof and the defective activity or the deemed unlawful activity is then not corrected, you need to start preparing a docket. That docket needs to go to the Municipal Court, it needs to go to the prosecutor. And if you can't prepare that docket, if you don't have the passion to really do it well, to make sure the affidavits are in place, to make sure the photos are in place, to make sure the notices are in place, then you are not going to do it.[1702]

They expressed that "it is all about the profession"[1703] and found it "heartbreaking to know that there are tools that should be enough to allow one to facilitate your duty, but as the departments in the Municipality are separate units and operate in silos, one cannot intervene". As a result, Participant D alluded that there has not been one conviction in terms of town planning transgressions or any type of by-law in the Municipality in the preceding five years. In response to a follow-up question regarding where the participant's department fits into non-compliance with by-laws,

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[1700] Participant D.
[1701] Participant D.
[1702] Participant D.
[1703] Participant D.

the participant explained that their department mostly plays an advisory role, but that as far as implementation is concerned, those functions are centred within the unit. The participant explained, further, that the units are specifically designed in a way to function as an individual and independent entity to make sure that there are no instances of holding back in terms of any processing or any enforcement issues that need to be rendered by a different department within the Municipality. The participant lauded the prosecutors in the municipal courts and considers them to be competent, as they are appointed by the DOJ. They then held that

> the breakdown of enforcing these issues, more often than not, will come to the enforcement phase where you need to start doing the preparation of the dockets and it gets to the prosecutor and the prosecutor will open up their file and he will sit like a teacher and just make these red circles and notes all over it because it doesn't comply to the standards required thereto.[1704]

The participant conveyed that they did not mean it as a criticism, but rather an observation in terms of their understanding of what could be done to facilitate change. Moreover, the participant specified that in terms of the enforcement side thereof, as soon as the constituents become aware of the fact that there's positive enforcement of the scheme or by-laws, people will adhere to it as it becomes the law. They revealed that they understand a clause or any provision to be negated by the mere fact that there's no enforcement thereof, as people will continue to do wrong, as there are no consequences. The participant also imparted that much of the blame for implementation issues and lack of sufficient staff or resources falls within the executive or senior management level. They stated that management should, firstly, understand their cluster or unit to know what the priorities are and ought to be in terms of capacitating the relevant unit and its functions, making sure that the structure of the Municipality and units within the bigger structure is suitable and functional and that there is synergy between the departments. As such, the participant articulated that while the restructuring of departments was meant to allow for unrestrained functioning and should have increased the potential to allow for performance in respect of duties and responsibilities, it has instead become an impediment to proper implementation by creating more silos. Over and above that,

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[1704] Participant D.

Participant D stated that having a legal department and not using those skills and expertise when dealing with aspects that relate to the legal domain, such as enforcement and drafting, for example, is unfortunate. They stated, further, that it is incumbent on the Municipality to ensure that job descriptions and requirements or qualifications designated for posts should include the necessary legal competencies. Having said that, the participant continued that

> I'm speculating, but dealing with enforcement issues without the necessary legal skills also then becomes tantamount to allowing for failure from the start, because you don't understand your legal processes thereto. How do you then expect a specific unit or department or whatever, to function optimally, if you don't understand those or the background thereto.[1705]

In relation to some of the by-laws being drawn up by external attorneys or consultants, the participant indicated that they find it concerning, as it meant that the Municipality and particular unit does not have the necessary skills to facilitate or conduct those duties or functions, and in procuring an external party to do it, while having legal expertise at hand should be deemed fruitless and wasteful expenditure. Additionally, they mentioned that there ought to be standard draft by-laws available to guide municipalities, and where such by-laws do exist and municipalities are paying exorbitant fees to external consultant, there should be inquiries as to why, and whether such by-laws have been approved and promulgated, because if not, these by-laws are not legally enforceable, and money is wasted. They also put forth that when dealing with the process of approving by-laws and all the committees that they must go through before being adopted, there is a disconnect between the roles of the administration and the members of these committees. They stated that there is a need for proper separation and understanding of the roles and responsibilities of each department, stating

> Leave it up to the administration that needs to be facilitated by the administration. Leave it to the technocrats. If I'm a lawyer, leave the law to me. As soon as it goes through the committees, trust the administrative officials… trust that they gave you the best possible product, and then pass it to make sure that you execute your legislative function to actually pass and not try and apply your mind beyond your scope of responsibility.

[1705] Participant D.

Participant E responded that their municipality uses the NEMA when it comes to issues of climate change and resilience, and as such, they derive directives from there. The participant mentioned that the Municipality has an Environmental Management Framework that their colleagues use to assess development applications or any other development that was proposed within the Municipality. They further indicated that there are other instruments, such as agreement-based instruments, even though they are not privy to them, but that such initiatives exist. With respect to civil-based instruments, the participant replied that they were not sure of those. They went on to explain that when their department receives development applications, they circulate them to all municipal departments for their comments, including transportation, planning, sanitation, storm water, and also environmental management departments for these departments to advise in terms of what is proposed, whether related to the legislation and compliance or to the plans of the Municipality before they may be used. The participant believed

> the challenge mostly is that at municipal-level, we are more regulatory than we create space for people to know about these things and appreciate them. So, when we respond, it's more of us saying, 'don't do this, don't do that'.[1706]

They elaborated that it becomes very difficult, even for developers, or normal people wanting to use their properties for certain things, to then accept the point or the view from the Municipality, because it comes at a point where they've already planned their whole thing out and they want to implement it in a certain way. The participant concluded by reaffirming that these instruments could be used to address climate change, but that they did not think the way in which the Municipality was using it was effective.

Participant F, from the outset, placed emphasis on educating the community and supported this response by stating that in the past environmental issues were not duly considered and included, and that it was therefore important to bring such issues to the attention of and awareness of people and educating them about what the law says in that regard. When coming to the enforcement, they argued that it

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[1706] Participant E.

was enforcement of a law that people knew existed and stated that "ignorance of the law is not an excuse."[1707] What followed is that the by-laws will then be another tool that one can use to make sure that people are compliant. The participant also explained that what happens in one area of a municipality may affect others in the district, which in turn affects provinces and eventually goes up to the national level. As such, they proposed that there should be coordination or correlation between all of these spheres of government before the Municipality can go out and consult with and engage the community. Furthermore, the participant, returning to the education aspect mentioned previously, indicated that basic knowledge is needed during engagement and that it needs to be explained to the community in a way that is informative but also easy to understand. The participant noted that enforcement goes with fines, turning the response to the incentive-based instruments, and indicating that if enforcement is effective and followed up on (in the case of compliance or contravention notices, for example), punishment will follow.

In response to this question, Participant H reiterated their stance on the use of by-laws and law enforcement, stating that the "formulation and adoption of by-laws and enforcement thereafter, that would be the main tool."[1708] However, they asserted that incentives and disincentives could also be effective, especially relating to the enforcement section, as

> It prescribes in terms of what processes should be followed, and there are also fines and penalties for those who do not comply with the relevant section of the by-law.[1709]

Participant H was hesitant or uncertain how to answer the question but stated that

> Any type of tools we have to sort of bring into effect climate change awareness would be useful, but I'm not… just not sure how we would go about it.[1710]

The participant acknowledged that they are aware of many projects that are going on, on climate change awareness, information, education, and so on, and that they felt that it is important. They did, however, voice their concern about how they

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[1707] Participant F.
[1708] Participant G.
[1709] Participant G.
[1710] Participant H.

would go about it at that stage. The participant mentioned that the environmental health department does a lot of awareness-raising, but mainly around waste and health. The participant commented that while there was some connotation of it happening, the concept was still relatively new for the Municipality.

Participant I responded with conviction that education was the most important and based their reasoning on the involvement of traditional authorities that are very important stakeholders in their planning processes, as they exercise power over demarcation of land or so-called stands. As such, they indicated that there is a big need for consultation with these and other stakeholders and service providers. The participant mentioned that from the Municipality's side, they inform local consultants, town planning consultants, and if the development is in the city, they include it on the website and that such developments usually require studies before development. The Municipality put a lot of effort into reaching out to the traditional authorities and educating them, providing workshops and engage with them on land development, and notifying them and explaining to them whether studies are required for any proposed development on their land to avoid hazardous development and avoid any natural disasters, as well as indicating what the legal implications would be. The participant raised that "the educational part from our municipality's side is the one we are using first, and then the other ones."[1711] The participant acknowledged incentives but indicated that their knowledge of them and how they are used in the present context is limited and refrained from touching on the efficacy of the other instruments.

Participant J pronounced that all of the instruments are relevant to addressing the impacts of climate change, on the condition that they are done properly. The participant stressed, however, that the biggest struggle in the Municipality, and perhaps the country, was enforcement of laws and by-laws. They argued that this leads people to do as they please and face no consequence, meaning that it breeds lawlessness. The participant also asserted that the delays in the court system also

[1711] Participant I.

affected enforcement, as it takes so long for cases to be heard that the wrongdoers have already made their money and left. The participant stated that

> All the other stuff is nice… but I think enforcement is making sure people comply with certain environmental laws and legislation.[1712]

Participant J declined to comment on the effectiveness of enforcement in the particular municipality, but did mention that any improvements would also rely on and tie into the court system being more efficient and fast-tracking the high court decisions on enforcing certain decisions or consequences. In relation to enforcement officers, the participant acknowledged their existence in their department or unit and that they issue relevant notices if there is non-compliance with the scheme or any approval conditions, after which these officers will pass it on to the legal section within the Municipality to take matters further.

Participant K said that they believed in awareness-raising per se and not policing people, which they considered to be a last resort. In this vein, they indicated that their section makes sure that the legislation is known to the constituency by all means necessary, to create awareness and education in terms of the environmental aspect. The participant mentioned that topics they educate the constituency on, include for example, what the responsibilities of citizens are, section 24 of the Constitution and what their environmental rights are, and ways in which they should assist the Municipality in making sure that they look after their own environment because of environmental and climate change issues. They make the community aware that these issues are not demarcated to only their jurisdictional area but that they constitute global issues, and they must be addressed from that perspective. Furthermore, Participant K also explained that some people from the rural areas of the Municipality have rich indigenous knowledge in terms of the environment and how they used to manage their own environment, and that the Municipality also seek advice from them or consult them. The participant also stated that in most cases, because the Municipality is urban and rural and has several traditional authorities, they will make sure to organise their workshops through their councillors

[1712] Participant J.

and chiefs. They indicated that the municipal officials are trusted, and that the communities will then attend their workshops.

In relation to the workshops, the participant noted that they ensure that there is some form of demonstration to illustrate for example, the importance of planting trees as a way of addressing climate change, informing the community of the nursery where they propagate and grow plants as a way of mitigating climate change in our city, the role of trees in absorbing greenhouse gases, etc. as a practical way of getting through to the community and creating awareness. Participant K reiterated that the aim is capacity building, so they go to schools and also create that awareness amongst the youth. The participant also referred to the Environmental Education Centre in the nature reserve where they take the school groups to educate them more about the environment. Additionally, they indicated that the Municipality has a partnership with the provincial department on economic development and environment to implement learning initiatives such as competitions where the children are provided a topic and are expected to then do a project on that and present it. There are also initiatives that the Municipality participates in, such as competitions to gauge their progress in terms of certain targets or projects, but with the intention to learn something, to see where they can improve, to get exposure, to receive guidance, and to possibly obtain prize money dedicated to environmental programs. The participant mentioned forums that facilitate learning and awareness campaigns, where the Municipality also engages a range of stakeholders. The participant alluded to the importance of collaboration between departments, especially in engagements with the communities. In respect of command-and-control instruments, Participant J confirmed that the Municipality has policy and acts in place and that they do perform compliance checks. In instances where there is no compliance, the Municipality will either issue a compliance notice or charge the transgressor.

5.4.5 SPLUM by-laws and urban climate resilience

Participant A started the response by referring to a few sector by-laws, such as the air quality management by-law and waste management by-laws as they are of the

opinion that these types of by-laws can be of use in addressing the effects of climate change and promoting urban climate resilience. They ventured further in referring specifically to their municipality's challenges relating to the lack of human and fiscal resources, The participant also stated that "drafting by-laws alone, is not a solution."[1713] The participant held that by-laws would help, but indicated that the problem with by-laws is that they are good on paper, but that municipalities need to be practical in terms of enforcing them with the aim of eventually helping with climate change. In illustration of their point, they explained that with air quality, for example, the Municipality will find that they don't have the equipment or money to buy equipment, saying

> I do believe that having proper by-laws is a good thing, but at the same time you need resources... your human resources, your equipment, your finances. You have to enforce what you've written.

The participant advocated for a holistic approach where municipalities are aware that the solution does not only lie with by-laws. The participant further conceded that corruption is rife, and the blame should not be directed only at resource challenges. They expounded on this by stating that, in some cases, there is money but that it is not used for its intended purpose. Participant A likened this to the widespread corruption that took place during COVID-19 where it was broadcast in the news that there were cases of maladministration and misuse of money meant for PPEs and protective equipment, and fraudulent tenders, for example. The participant further illustrated their point by saying

> Sometimes there is money, but it's not used properly or for what it was meant for… or a person gets a tender but doesn't deliver and doesn't do what he was appointed to do. We appoint the wrong people because of corruption, or we appoint people who are not qualified to do the work, or they don't do it properly, so more money is needed to fix the first person's mistakes.[1714]

They emphasised that there are many such challenges that affect the implementation of the by-laws.

[1713] Participant A.
[1714] Participant A.

Participant B's response initially focused on the use of the SDF as a tool for addressing climate change issues and promoting urban climate resilience. The participant held on to the notion that the SDF is suited because it has environmental chapters or parts that could contain more detailed information on the aspects of climate change and urban climate resilience. Other reasons for the suitability of using the SDF included the annual reviews and intensive community consultation and involvement. Participant B reasoned that, as such, it had good potential for setting standards. The participant then reflects on the use of the land use by-law, stating

> I don't know if the land use by-law can contribute so much because it's regarding land use applications, procedures that must be followed. I think the only thing that we can do there is to request that environmental groups must be consulted. I think that's the limit... I think it must be an environmental by-law. But a land use by-law... I don't see how it can contribute to a resilient city, except if there's something in it.[1715]

The participant then explained that the land use by-law only contained environmental zoning as a relevant part, but that they could not see the land use by-law as being of further relevance. The participant also suggested that they could consider such a use for the by-law, but that they would need to see an example of how it is done before committing to that and maintained that they did not think it would be of much relevance beyond what they mentioned in the interview.

Participant C deemed the SPLUM by-laws as important in resilience and justified that whatever processes and steps are included in this by-law could incorporate resilient aspects. They then went on to explain that

> usually in town planning, climate resilience is best captured in the design… in the design's initial stages. For example, if we are to request certain things in the design of buildings, like incorporating green aspects, and we make sure that it becomes mandatory for buildings to have, for example, double volume rooms to enhance circulation rather than air conditioning that is expensive and energy intensive, allow buildings to have natural light through sunroofs to minimise the use of electricity that is continuously on. If the building has been designed in such a way that it allows light and filtration of light at the right angles, that would really help.[1716]

[1715] Participant B.
[1716] Participant C.

The participant echoed that it was possible to incorporate a lot of green design elements through the use of solar energy, use of light, going green completely and being off the grid. They also reinforced the idea that those things can be incorporated into our by-laws, and they can be enforced. If this were to be done, the participant stated that any new development would be required to adhere to those design aspects and that while "they might seem unimportant, but in the long run, they have major benefits."[1717] The participant took the explanation further by giving examples of more instances the Municipality could use to contribute to resilience, including that all relevant departments of the Municipality can come up with mixed-use developments for spaces and incorporate design aspects that reduce the adverse effects of natural disasters, such as, for example, NMT, planting trees, and so on. They restated that it is possible to use the by-laws for this purpose "because by-laws typically control and manage the urban environment."[1718] Participant C also elaborated that such an initiative or move is possible, but it would have to be a combination of spatial planning, roads and stormwater, electricity, parks, housing, and more that would need to come together and have the same motives, the same objectives at the design level. Participant C also touched on the relevance of the SDF, as it incorporated a lot of green elements and identified spaces where the Municipality do not allow development at all and indicated that this was enforced by the by-law and SDF.

> So, wherever we have marked in green, we will not entertain any form of building or development. So, to protect the ecosystem, to protect our rivers. In the Brown area, that's agriculture, or to the West, we do not allow any type of development, and towards the river, we only promote tourism-related activities. So, this is an example of how you can incorporate these. In the SDF level we label it as "supported", "not supported at all", "prohibited".[1719]

Participant C concluded their response by reaffirming that such an approach and incorporating these things can make it work.

[1717] Participant C.
[1718] Participant C.
[1719] Participant C.

Participant D stated that SPLUM by-laws and by-laws in general could be used to promote urban climate resilience. As such, the participant commented that "the by-law allows you to draw your own road map, in terms of what you want to see as part of your outcomes."[1720] They confirmed that SPLUMA in itself brought a whole new dimension to the understanding of planning in local government. Under the ordinance, the participant described that, it was all about need and desirability, about the technocratic environment of the planning domain, land use, and designated areas, schemes, and where they wanted to facilitate what type of use, as well as how they wanted to merge various future uses and development of the town or the city. Conversely, with SPLUMA, it moved away completely from that absolute technocratic environment whereby it was all about planning principles, and it provided extra dimensions. Now, all of a sudden, these changes meant that "previously, town planning was about the town planners and now town planning is more about the lawyers than anything else."[1721] They attributed this to all the different dimensions being introduced, which go beyond mere planning. The participant recalled that the old schemes did not address the environmental side or climate resilience, but that it is imperative to understand the potential of the document or the by-law. They said that

> If we understand it and we understand the subject matter and we are experts in our field, then we can utilise that as a tool that has far-reaching effects instead of just being out there.[1722]

They commended the land use management department's way of utilising the by-laws and the way that it was drafted, as they consider it to be dynamic. However, the participant implied that there was room for improvement and that certain amendments could be included. They drew particular attention to administrative notices and enforcement notices and pointed out that there were shortcomings in terms of the enforcement of by-laws that would first need to be amended within the relevant laws, but stated that these by-laws under SPLUMA are progressive as

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[1720] Participant D.
[1721] Participant D.
[1722] Participant D.

they address issues of the environment and consideration of specific aspects thereto.

Participant E took their response back to the principles of SPLUMA and stated that they required the Municipality to look at these considerations and implement them in all their functions and duties, whether spatial planning and land use management or others, they had to consider these SPLUMA principles and see whether a proposal was talking to that. The participant stated that the legislation requires the Municipality to assess applications and develop plans according to the SPLUMA principles, one of which is spatial resilience. They added that a municipality can also not look only at spatial resilience but should also consider all other factors affecting the space, and that all considerations need to be aligned with SPLUMA. They explained that this meant that a person, developer, or the Municipality could not develop any plan or approve any application that counters what SPLUMA is proposing. The participant indicated that they believed that if instruments and developments were implemented accordingly, there was a possibility that it could promote urban climate resilience because the law allows that, "in fact, it dictates that we do that."[1723]

Participant F also confirmed that these by-laws could promote urban climate resilience and based their response on their by-laws, speaking to the engineering part of development and includes reference to environmental sensitivity. They explained this in practice by using one of their experiences as an example to convey what they meant and to make the point that the enforcement of these by-laws is very critical. Linked to that, they highlighted the need for compliance. The participant also noted that the by-law is broad in terms of what requirements they need to satisfy, but in instances it may require compliance with NEMA, for example, and the applicant or developer is expected to do that exercise and provide the necessary report to the Municipality for perusal. The participant clarified that if the outcome is negative in terms of these reports, they do not allow development to continue, unless the report also includes appropriate mitigating factors. They

[1723] Participant E.

indicated that the confusion comes in with SPLUMA, because it's developmental in nature and said that

> But I must be honest with you, in some instances, development is development. When it comes, people expect miracles, which is mostly the developers. Sometimes you remember I'm advising, I am the direct contact of the guys from town planning. Most of the time, I'm accused of stalling the development because you will have a negative comment on some of the things, because you are not happy with the process that is being followed.[1724]

The participant stated that the Municipality's "by-laws contain almost everything."[1725] They elaborated by stating that these by-laws included the composition of the Municipal Planning Tribunal and the Appeal Authority, which in turn comprised the colleagues from different business units in the Municipality such as environmental management, the building section, the electricity department, the waste management, the land survey department and the composition of mostly the critical departments, which made the decisions taken by the committee more reliable.

Participant G, in describing how the by-laws can be used for promoting urban climate resilience, mentioned section 51 of the by-laws, pertaining to matters that a Municipal Planning Approval Authority must consider when it decides on or makes a recommendation on an application for municipal planning approval. They stated that the by-laws can be used in a manner compliant with national environmental legislation because each development within the Municipality can only be approved if it is in compliance with the by-law and all other considerations that applications are subjected to, including environmental management considerations, *inter alia* environmental authorisations, impact assessments and scoping reports, found in law. Participant G held that this was "the main way in terms of how it can be used to achieve the goal of climate resilience."[1726] The participant also showed understanding of the reasoning behind these requirements and stated that "the main aim is to combat the climate change issues as well."[1727]

[1724] Participant F.
[1725] Participant F.
[1726] Participant G.
[1727] Participant G.

Participant H agreed that by-laws could be used to promote urban climate resilience and described by-laws as giving "teeth to our comments or give meat to it when commenting"[1728] because, in their opinion, the Municipality did not have very good legislation in place that could assist them in preventing development in undesirable areas. The participant used the open space by-law as an example, stating that their unit had taken a stance as they have seen too much of the city's open space being lost, not just within the city CBD, but in the whole of the Municipality and stated that

> When we spoke to our town planner guys, they said that the city is already so developed, the only places that they actually can develop now are in open space areas, and our argument is that these spaces were zoned as open space for a reason. There are linkages and there are sensitive areas, they're linking certain areas for biodiversity and ecosystem services… you cannot let go of these areas for a specific reason.[1729]

They then indicated that the main tool that they use to stop development in these areas and to ensure that the zoning is respected is the by-law, as it allows enforcement. The participant emphasised the importance of trying to save as much open space as they can, despite the city's space constraints. The participant mentioned that these spaces are considered desirable for development with many people feeling that these areas are not well maintained, but that the department is trying to resolve that to some extent. They stated, however, that the Municipality's parks and recreation section, which oversees open space areas or maintains them, is facing challenges such as being understaffed and 'not having enough resources. They elaborate that financing is a problem in getting the resources that they need. The participant stated that these challenges caused severe delays in realising their duties and performing their functions.

Similar to Participant B, Participant I placed a lot of focus on the SDF of the Municipality in their response. The participant indicated that when the Municipality does studies, it goes into the SDF and that from a planning perspective, they are then able to identify places that are environmentally disadvantaged and not suitable

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[1728] Participant H.
[1729] Participant H.

for development. In view of this, the participant purported that it does not go too much into detail but because they consult different stakeholders that are situated in the environmental unit, and the cultural unit, and the provincial side, when drafting the document, because they get the broader picture on the issues, which capacitates and assists them in drafting these documents. The participant construed that this was also important when clients came for future development advice, as they are then able to advise them accordingly through the use of the SDF and other small outputs of the Municipality. When asked how much the SDF and the IDP, for example, feed into what is in the by-law, the participant remarked that

> what happens is, the SDF is a component part of the IDP. Now, the SDF is the forward planning, the one that directs future development within the city. So, when somebody is trying to come to the city and wanting to develop, we first look at their compliance with the municipal planning by-law. So, whoever comes applies in terms of that by-law in relation to the SDF, so we link the two.[1730]

They indicated that alignment was needed and that to get one to work, you have to work with the other. They went on to say that once an application in terms of the by-law comes, they compare it with the SDF. They highlighted that is important to compare them to make sure that the information corresponds and that they do not accidentally approve a development in such an undesirable location.

Participant J also affirmed that such by-laws could promote urban climate resilience, and their response was also focused on the SDF rather than by-laws. They stated that "the whole premise of having a municipal spatial development framework is to contain development in certain areas"[1731] as to not encroach on open space or farmland for development, and channel certain developments into certain directions. The participant explained that there are a lot of policies that the SDF must take into consideration.

Participant K's response was vague in terms of by-laws and focused more on application procedures and what considerations need to be included when deliberating on development applications. They particularly referred to the use of

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[1730] Participant I.
[1731] Participant J.

environmental tools and legislation to determine whether a development will have a significant effect on the environment based on the listed activities in listing notices 1 through 3 of the EIA regulations. They said they needed to use these instruments to determine whether a basic or full EIA is needed in the event that an EIA or scoping report is triggered by the proposed development. Participant K also touched on the departmental relationship and involvement needed when considering applications. The participant mentioned measures that ensured that the Municipality complied with legislation and refrained from approving undesirable development applications, but did not expand on it in their response. Insofar as by-laws are concerned, Participant K acknowledged that the spatial planning and land use management department has its own by-law, and vaguely asserted that their department had its own by-laws and that they considered them "if and when we do that."[1732]

5.4.6 Status of the spatial planning and land use management by-law

Participant A acknowledged that the Municipality had a spatial planning and land use management by-law, but they were not sure when it was done because they were not involved. The participant indicated that the "user department" did their own by-law. They shared that it must have been fairly recent or new, as it was done shortly before the Municipality closed due to COVID-19, so they would say that it was two or three years old at the time of the interview.

Participant B confirmed that the Municipality does have a by-law and that it is rather recent (in terms of the interview, which was in 2022) as it was promulgated in 2018. The participant held that for their municipality, it is considered quite new. As to what the participant understood to be contained in their by-law, they mentioned that it contains mostly processes. Then they went on to say that it also includes, inter alia, enforcement of the by-laws, sections on policies, procedures, standards, requirements and guidelines. They elaborated that the by-law provided an opportunity for the community to give input. After a moment of deliberation,

[1732] Participant K.

participant B surmised that it comprises a procedure, and it gives community involvement and definitions.

Participant C confirmed that the Municipality had a spatial planning and land use management by-law, and that it was approved in 2018. As to their contents, the participant recalled that it has processes and procedures for submitting applications, their processing, and finally approval, stating that "it stipulates the whole process from start to end in detail… there's no room for someone claiming they didn't know."[1733] The participant also included that everything was regulated in terms of the SPLUMA. They noted that the purpose of the by-law is to clarify the process so that everything expected in terms of the development application is clear, straightforward, and open.

Furthermore, the participant elucidated that the by-law is very comprehensive as it contains definitions related to town planning and spatial planning; the municipal spatial development framework, the main contents thereof, the legal effect, and the status quo of spatial development framework; the functions and duties of the project committee; the land use scheme, it's legal effect, whether the Municipality is able to amend their town planning scheme or not; the purposes, functions and composition of the municipal planning tribunal (MPT) and appeal authority. The participant considered the composition of the MPT as transparent, clear, and properly explained in the by-law.

The participant also shared that during the development and adoption process of the by-law, there was adequate public participation, it was advertised, and stakeholders were invited to comment. The participant stated that the Municipality took extra effort to communicate directly with town planning consultants within the area, including estate agents. They went further to include that anyone who submits an application in the Municipality has been notified by e-mail, as well as meetings that were held to allow them to ask any questions and to give input. The participant also noted that newspaper adverts comply with the requirement in SPLUMA. When

[1733] Participant C.

it was finally approved by the Council, it went through the processes of approval, was eventually gazetted, and came into law. The participant reminisced that when it came into law and was approved, it became compulsory for all town planning applications to be submitted in terms of the by-law. Participant C stated that an email was written to all town planners, town planning consultants, and all stakeholders so that they were aware that all applications needed to be submitted in terms of the by-law and so they could familiarise themselves with it.

Participant D merely acknowledged that the Municipality had a spatial planning and land use management by-law and only elaborated on the contents later in the interview.

Participant E established that the first spatial planning and land use by-law that the Municipality developed and adopted was in 2016, shortly after the enactment of SPLUMA, which was in 2015. They elaborated that their municipality had a recently reviewed by-law adopted in 2021, after having commenced the review process in 2019. Additionally, the participant noted that the by-law guides the process of the appointment of MPTs and the appeals structure, details the process of lodging applications and appeals, categorises applications in terms of who makes decisions for what type of applications, and it also provides for intergovernmental relations.

Participant F confirmed the by-law's existence, and mentioned that at the time of having to draft the Municipality's first spatial planning and land use management by-law, after the promulgation of SPLUMA, the Department of Rural Development at the time, "facilitated the process and provided a 'specimen' for the Municipality to work with and align it with what they do as a municipality,"[1734] and could not take it as it was. The participant stated that the technical part of the by-law must be done so that it is easy for people to read and understand what is required of them. Furthermore, the participant held that the SPLUMA by-law was easier in terms of specifying the application process and that they found it easy to deal with the enforcement part of it. Participant F indicated that the by-law was broad in terms

[1734] Participant F.

of covering the rural areas in the PDA and that they did not have those areas until the establishment of the by-law. The participant added that since they had the 2016 version, they could identify the gaps as they went along, and eventually have a revised version of the by-law.

Congruent with Participant F's response, Participant G also mentioned the generic version of the by-laws prescribed by the Department of Rural Development. They indicated that they had to use the generic version and identify changes best suited to their municipality's circumstances.

Participant H did not form part of a spatial planning, land use management or planning department. In this instance, the question was slightly adapted to refer to by-laws more generally to allow the participant to elaborate on by-laws to find out if their department had or potentially could benefit from a by-law. Diverging from spatial planning by-laws, Participant H indicated that their department did not have a specific by-law but indicated that they had other things in place that could help them. Amongst these, the participant mentioned an integrated environmental management policy, a climate change policy, an environmental management framework (EMF), a strategic environmental management plan, a desktop analysis tool that helps them identify sensitive areas before they go out to site, a conservation plan that's a mapping tool, a strategic environmental assessment (SEA), and an environmental management plan as well.

Participant I indicated that they had a spatial planning and land use management by-law, which they review every five years, as they "believe that after that, development trends have changed."[1735] The participant noted that their by-law was developed in 2017 and was due for review in the following year (2023) and that 2022 was therefore its final year of operation. They elaborated that based on the challenges they experienced in that document and then they would then review and align it. They described the process as follows

[1735] Participant I.

> We start by identifying the challenges from the previous by-law. Then we incorporate them into the set document that we have. We do not change the complete document; we look at challenges that have been faced by our consultants. We then take it through to public participation in accordance with the timeframe stipulated in SPLUMA. Then the comments come, after the comments have been addressed, we will submit to the government council committees for compliance, and once they are happy with it, is it lawful and once again. The legal department must also look at the document. Then it goes to council for approval.[1736]

They further elaborated on the contents of the by-law, stating that it contained processes relating to the establishment of the land use scheme of the Municipality, the MPT, different types of applications, along with information required when applying, timeframes, and contraventions, amongst others.

Participant J, as in a previous response, focused on the SDF of the Municipality and not the by-law as posed in the question. The participant, however, mentioned that the SDF was outdated (as it was a 2010 document) but that they were working on a review.[1737] The researcher prompted the participant on what the by-law contained, to which the participant responded

> It's a procedural document. So, it tells you how to apply and what you must submit with applications, how the MPT can function, what's their scope that or their power they can do, to authorise official. So, it's basically a procedural document. It's not a policy or a framework plan or… it's just basically a procedural document in terms of town planning.[1738]

Participant K, also having to diverge from the SPLUM by-laws as they are situated within a different department, indicated that they had such department specific by-laws in the pipeline but that these were unfortunately still in a draft stage. This participant referred to other by-laws such as the open space, air quality, and waste management by-laws of their municipalities and ventured to touch on some of the aspects included in these by-laws such as emission standards, permits and licenses, and that although they did not speak directly to climate change or urban climate resilience, they relate to these topics by virtue of addressing GHG emissions. The

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[1736] Participant I.

[1737] The review has since been completed and a new version of the SDF is available. See para 5.3.3 above.

[1738] Participant J.

participant also elaborated on initiatives through which they were hoping to respond to the effects of climate change and urban climate resilience.

5.4.7 Involvement in drafting and implementation of by-law

In response to the question on their involvement in the drafting and implementation of the by-laws, Participant A proffered that they were not directly involved in the drafting of the spatial planning and land use management by-law. The participant disclosed that their municipality's process of passing by-laws involved consultation with all other relevant departments within the Municipality for input. As such, their involvement was limited to giving input. According to the participant, this consultation occurred through sharing the document that they prepared, so that the other departments could work through it and provide input. They asserted

> that's what we do with all our by-laws. We distribute them amongst various departments for their input.[1739]

The participant confessed that the entire by-law, from the drafting stage, was done by the unit department. In addition, the participant indicated that they acted in an advisory role through the comments and inputs on the drafts, but that it was ultimately for the unit department to decide whether to include the comments received. Participant A also stated that they do make the necessary changes if they agree with the comments received, but that they do consider all the comments. The participant clarified that they are involved in the drafting of other by-laws, but that the spatial planning by-law was done by that unit.

Dealing with the question at hand, Participant B pronounced that they were involved in the drafting stages of the spatial planning and land use management by-law. The participant also disclosed that the provincial department had appointed a consultant to assist them in drafting the by-law. They conveyed that:

> what should have happened with SPLUMA is that each province should have produced their own provincial legislation. But ours didn't. What they did is they assisted municipalities to produce their own by-laws. So, they appointed the consultant and then the consultant came to land use. I think together with legal,

[1739] Participant A.

> and we had to sit with them without any prior knowledge of developing by-laws and what must be contained in the by-law, and we assisted them in developing this document.

As such, the participant held that it was a department effort requiring them to sit and go through it. In respect of the responsibilities, the participant conceded that the consultant drafted most of the by-law. However, the participant indicated that the department within which they operated commented on the by-law drafted by the consultant. They elaborated that upon the finalisation of this contract, they took over the editing role, finalised it, and then proclaimed it.

Participants C stated that "every town planner was involved directly in the process"[1740] of drafting the new by-laws. Furthermore, the participant mentioned that they had to approach the provincial department to assist, as their department did not have the capacity to draft such a by-law. The participant said that the province agreed, provided funding, and appointed a service provider. They elaborated that their duty, as the town planning department, was to guide the process from start to end. As such, they had to compile an inception report, a spatial planning proposals report, and at every juncture of that formulation process of the drafting, they had to report directly to the department, while every town planner had to attend and offer their input.

Participant D indicated that they were not involved in the drafting of the by-law, as their instructions come from their own department and not from the user department. The participant also voiced their discontent regarding other departments not using the services that are readily available to them. According to Participant D, their department:

> do in-house our services agreements, we do in-house our memorandum of understandings, we do in-house our contracts, you know, and those are critical documents with financial implications. So, why shouldn't the rest also follow suit?[1741]

[1740] Participant C.
[1741] Participant D.

They further stated that, in their opinion, appointing external consultants at exorbitant cost to the Municipality is classified as fruitless and wasteful expenditure. The participant also argued that this indicated that the particular department did not have the necessary skills to perform its functions. The participant conceded that it came down to capacity and filling critical vacancies within departments.

Participant E announced her pride at being involved in the drafting of the by-law. The participant admitted that during their first time drafting the by-law, the legal section within the Municipality was very involved. Nevertheless, the participant indicated that they and a colleague did the review of the by-law. Participant G revealed that they had to do their own research in terms of how to incorporate the new aspects that were not covered by the old by-law. They mentioned that the legal services section verified whether everything was compliant with the law toward the end of the process. In respect of Participant G's responsibilities in this regard, they merely replied "everything" before going on to explain what triggered the review of the by-law. They went into more detail by including aspects better suited to the context of the Municipality. They also divulged that they had used the old by-law from 2016 until 2021 and noticed their shortcomings and loopholes in terms of time frames, for example, and that there were inconsistencies between the by-law and SPLUMA, which meant they had to align the documents.

Participant F was involved in first version and the review of the by-law. The participant stated that the

> SPLUMA by-law was easy in terms of specifying the process… the application process. It was easy also dealing with the enforcement part of it.[1742]

Participant F, in the context of the review, stated that they had different departments proposing certain things, along with people from outside the Municipality proposing certain things.

Participant G described their involvement as being responsible for reviewing the entire document. Accordingly, this meant that they tried to address the gaps in

[1742] Participant F.

those by-laws of 2016, while also addressing the issues that were mistakenly omitted. The participant's involvement was to review the entire document, together with a colleague, and to align it, and go through the generic draft provided by the provincial department to see if the suggested changes were suited to the Municipality's circumstances. If the suggested changes were not suited to the Municipality, the participant and their colleague had to try and rephrase it to respond to the issues of the Municipality. Participant G acknowledged that they were not involved in the original draft but noted issues as it was being used and implemented. The participant, in this respect, stated, "'You'll find that the document can only be faulted once you implement it."[1743]

As Participant H did not form part of the planning units in the Municipality, they elaborated on their involvement in other aspects that relate either directly or indirectly to the question at hand. As such, Participant H revealed that they are involved in looking at development applications, rezoning applications, applications for development in open spaces or existing developmental areas, building plans, and project applications. The participant articulated that their department is very cross-cutting as they deal with a lot of stuff within the Municipality. They also noted that they often refer applicants and other departments to relevant sources from an environmental perspective and advocate to get the applicants and other departments to incorporate such instruments to promote urban climate resilience and address the effects of climate change.

Participant I was also involved in the drafting and the editing of their municipality's spatial planning and land use management by-law. The participant showed a hard copy of the by-law, which was a pocket-sized bound copy of the by-law that the participant mentioned their department had done for their police academy, describing the by-law as "a document you need every day." In describing their involvement, the participant also made mention of a customised by-law from the Department of Rural Development, for there to be a uniform approach within the Municipality, and so that legislation could be the same throughout departments. The

[1743] Participant G

participant then described that they effectuated changes in application procedures, set out the new ways of submitting documents, included offenses, and factored other aspects such as development of the land use scheme, set out how it relates to other legislation in the country, checked compliance with other legislation, and ensuring they don't contravene. The participant reaffirmed that they were involved in the whole process.

Participant J alluded to the fact that the spatial planning section (division) was responsible for doing the by-law and that the participant's department was just consulted. The participant likened this consultation to workshops or meetings, and that the different departments would go through the by-law, and the participant's department would make inputs or comments. Participant J clarified that the spatial planning section does all policy drafting, all policy matters, frameworks, and legislation from the town planning side, and that it was up to that department to then consider the inputs and comments.

Participant K indicated their involvement in the drafting of the by-law. The participant held that

> for all those draft by-laws I was involved as a key player because we checked our drafting of the policy, we checked the state of the Municipality and also like the legislation in place and see how then we can localise them. We can try to simplify them, given our own background, per se, and what is to offer in the local sphere of context? So that is what we do because we take into cognisance the acts that are in place and see how then we can simplify it.[1744]

The participant explained that they have plans and a strategy that they must refer to and determine how they can be localised in terms of drafting policies. Moreover, the participant illustrated that they sit and write the policy or the by-laws with other members from their department, as they "once hired the consultant, who just made a mess and ended up leaving."[1745] Participant K explained that they would sit and go through the draft and, in most cases, they would also have thorough consultation with other specialised areas within the environment sector. He confirmed that when

[1744] Participant K.
[1745] Participant K.

they are approached for comments or consultation, they would act in an advisory or commenting role. The participant also revealed that they are part of the team in the process of renewing the SDF.

5.4.8 Specific requirements, discretion and amendments

This particular section consisted of three separate questions in the questionnaire that set out to determine with the participants were firstly, aware of specific requirements or conditions that they considered during the drafting of the by-law and to gauge their knowledge on what is required in the SPLUM by-laws; secondly, whether municipalities had the discretion to include aspects related to climate change and climate resilience in their SPLUM by-laws; and lastly, whether they would recommend any amendments to their existing by-laws based on the discussion in the interview.

5.4.8.1 Specific requirements for by-law drafting and content

Participant A indicated that some of the considerations when drafting by-laws included that it should be within the mandate of the Municipality. They stated that there might be things that fell outside their power, and they had to check whether they had the right to make by-laws on the matter at hand. They further stated that the Constitution was specific on which areas they can pass by-laws on. Other than that, the participant indicated that they had to peruse the whole document and check the accuracy of information and comment only on aspects within their expertise. In terms of specific requirements, the participant indicated that they are not aware of any other specific requirements for the SPLUM by-laws.

Participant B reflected that some of the considerations required for drafting by-laws were to consider whether the by-laws were SPLUMA compliant, and they would consider other legislation, such as the ordinances, would consider the processes included in other legislation and how their by-law could improve on that. The participant indicated that they looked at these to try to make the by-laws more efficient. Participant B also indicated that SPLUMA requires that municipalities have by-laws. The participant further held that everything must be done in line with and

in compliance with SPLUMA. The participant emphasised that by-laws, as local government legislation, should not contradict SPLUMA or any other national legislation. The participant noted that another requirement was to ensure that all gaps are addressed, as they realised that they had missed sections in the by-law in relation to township establishment, which meant that there was a gap, and they had to supplement the by-law with the ordinance to try and bridge that gap. The participant mentioned that another requirement was uniformity, as it was described as a purpose of SPLUMA, but opined that this purpose is unsuccessful because all the different areas have different by-laws with different ways of doing things. In a follow-up question, the participant responded that what they would recommend instead of the provision for specific circumstances within local governments, that policy would be better suited to indicate local needs and circumstances. They indicated that legislation pertains to the procedures, enforcement and zoning and that other instruments like frameworks could be used for municipal or area-specific circumstances and aspects related to the environment, climate change, and so forth.

Participant C held that considerations during the drafting of the by-law included ensuring alignment with current legislation and the current processes, and whether they could improve on that. The participant also indicated that they changed some of the systems that were unfavourable to residents or applicants and that they had tried to accommodate these views. Regarding specific requirements set out in law, participant C highlighted the process relevant to submitting applications, the steps taken into consideration of the application, relevant timelines, and objections.

Participant D stated that when it comes to requirements, it is about regulatory aspects pertaining to the way that the by-laws should be. The participant said that "we should get out of that box, because then we are merely ticking the box." Instead, he recommends trying to implement the principles, the objectives, and determining what the actual outcome of SPLUMA should be, instead of doing the tick box exercise. The participant also stated that

> As soon as you just start pronouncing on your regulatory requirements, then we are going to miss issues like your resilience and your environmental aspects.[1746]

The participant opined that everyone could tick the regulatory boxes, but as a result, it does not lead to buy-in, which means that the by-law then stays a document and does not become a mechanism to address the desired outcome.

Participant E stated that some of the most important considerations when drafting by-laws are practicality for applicants and decision-makers, relatability in terms of speaking to the issues that are prevalent, being in an understandable, clear and concise language, and compliance with national legislation. The participant posited that SPLUMA is rather vague on the specific requirements of the by-laws, and as such their department had to consider the critical aspects that had to be there such as provision for SDFs and LUMs, enforcement provisions, procedure for lodging an application, and the composition and appointment of structures like the MPTs and Appeal Authority as well as clear timeframes for procedures and decision-making.

Participant F underscored the importance of the by-law reflecting the application process, and the role of the registrar, the composition and appointment of the MPT, the advertisement and public participation process, and applicable timeframes.

Participant G holds that there is no indication in terms of what should specifically be included in the SPLUM by-laws. The participant stated, however, that an important consideration when drafting by-laws is the alignment thereof with the provisions of SPLUMA and not deviating from the specifications stipulated therein. The participant mentioned that their department had challenges regarding the timeframes as stipulated in SPLUMA, and as they had included them in the by-law, though the Act ought to supersede the by-laws, they were still challenged in this regard and had to source a legal opinion to advise them on their own by-law.

Participant H mentioned that as part of the requirements, they would have to consider an application based on whether it triggers listed activities in NEMA, and if it did, the developer had to go to the Department of Environmental Affairs to get

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[1746] Participant D.

comments before they could approve an application. The participant also explained that when the planning department has meetings on the revision of their by-law, they do tell them about the documents, and we tell them to include the information on what the Municipality has. The participant observed, however, that the planning department has taken "a lot of stuff" from the Green Book or National Climate Change Information System (NCCIS).

Participant I highlighted the importance of interpretation, especially in their municipality, where traditional authorities became more involved in the development process. The participant elaborated on this inclusion of traditional authorities and how it affected the development application procedure:

> what happens is that there are forms included in the by-law for any development within traditional authority land, requires a stamp, so if you are from a rural settlement before you develop, you will need permission, you will need your head/chief to stamp the form indicating that they are aware of this development that this person wants to bring to the community. So, the Municipality cannot process it due to the law.[1747]

The participant described the inclusion of traditional authorities and the resulting need for interpretation as challenging. They stated that the traditional authorities were the first people they had to consider, especially in terms of interpretation. The second challenge the participant noted was sections that were changed, new introductions to plans and how the land use system should operate. One of these problematic changes in their municipality related to the concept of pre consultation, which the participant described as

> before intending to submit an application, developers or applicants bring their application for pre-consultation with the Municipality to address it with them first so that they don't have holdups with disapprovals or having hearings or objections or people not wanting that development, and to provide the Municipality with an idea of what you are trying to do.[1748]

They described further that if someone is not familiar with the site, they will go to the site for inspection, they sit as planners and will also have town planners and consultants. They also reflected that the pre-consultation process is aimed at

[1747] Participant I.
[1748] Participant I.

shedding light on how developers or applicants should apply, which sections to look at in the by-law, and how to do the public participation process.

Participant J could not recall specific requirements in terms of SPLUMA, but they mentioned that there were certain sections in SPLUMA that spoke about the by-law, also about the functions of the MPT, and the appeals tribunal.

Participant K indicated that they wished not to respond to this question as they felt it was not within their purview and indicated that the spatial planning and land use management department ought to answer, and they did not wish to contradict them.

5.4.8.2 Discretionary power on what to include in by-laws

Participant A shared that the Municipality does have a discretion in terms of what to include in their municipal by-laws, as different municipalities have different circumstances, and as the situations are different, they need rules based on the circumstances of that area.

Participant B agreed that municipalities have discretion on what to include in their by-laws, and that they used such discretion in their by-law, as it is an instrument speaking specifically to the Municipality's conditions and how they wish to manage things.

Participant C admitted that they had to improve in terms of using their discretion when drafting municipal by-laws. They explained that while they have incorporated aspects of urban resilience partially in their design aspects, they admitted that such initiatives could be legislated and captured in the by-law. The participant opined that the by-law is a framework in a way, and that, as town planners, that was where they could incorporate some of the climate resilience aspects, as by-laws are not rigid. They elaborated that in the by-law, there is room for them to come in as it gives structure but also reflects the needs of a particular municipality. The participant also cautions, however, that these discretionary provisions should be aligned with other legislation and should also be favourable to the Municipality and

the consultants that they deal with daily. The participant pointed out that when looking at their by-law, one would not see the word "resilience".

Participant D asserted that municipalities do have discretion in terms of what they could include in their by-laws and that "the law in itself is dynamic [and] progressive"[1749] as long as they do not overstep their mandate, and the legislative and executive authority assigned to the local sphere of government. The participant elaborated that municipalities could potentially move beyond mere compliance and what is deemed to be the competency of local government if local authorities would "apply their minds more liberally"[1750] in terms of what we see coming from the courts and being pronounced by the courts.

Participant E indicated that contexts between municipalities differ and that when drafting by-laws, one only has to consider what is applicable and best suited for the specific municipal circumstances. In addition, the participant made a case for including provisions in the by-laws to speak to the plans and frameworks of the city that ought to be considered in development applications and to give a measure of enforceability to them, in the sense that the Municipality would not entertain development proposals or applications that deviates from these plans. The participant correlated this with climate resilience,

> if the Municipality says that it does not have enough plans in place to enforce that… because the by-law is law, we can put it in. [1751]

Participant F conceded that municipalities have a discretion on what to include in their by-laws as "whatever they put is based on what they experience on a daily basis on receiving an application."[1752] The participant was reminded that the discretion must not be abused, should not be contrary to public needs, or to public interest. The participant also placed emphasis on public participation and engagement with the comments of the community, and the weight those comments

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[1749] Participant D.
[1750] Participant D.
[1751] Participant E.
[1752] Participant F.

carry in relation to the by-law. As it affected the interests of the public and the community, such discretion should be applied judiciously.

Participant G recalled that their old by-law contained a gap in terms of the timeframes for the different steps in the application process and procedures. The participant imparted that their old by-law omitted the operational processes or time frame processes within the Municipality and that while it had included the applicable timeframes for the registrar and so forth, but that there was a gap in terms of when the application closes in terms of public participation process, terms of the planner assessing the application. Participant G shared that they then had to include those timeframes in their review, to fast-track development and ensure that development happens in an orderly manner and service delivery is done timeously within the Municipality. The participant declared that as their "discretion based on our observation on using the old by-laws and our experience."[1753] When prompted on whether the discretion could be extended to climate resilience, however, the participant was quick to answer, "not necessarily".[1754] They then explained that an

> application gets circulated to all relevant departments, including environmental management, so they can indicate whether specialist studies will be required, and by the time that the application gets submitted to the planning department, all those studies should have been done and approved…if not done, the registrar does not further refer the application until all the specialist studies have been achieved or have been done.[1755]

Participant G went on to mention that the by-law sets out a list of matters that must be considered by the MPT whenever they are deciding on development or on land use management applications. They include, amongst the list, compliance with all the SPLUMA development principles as listed and stated that it forms part of a mandatory requirement that applicants or the MPT should ensure that an application fully complies with the SPLUMA development principles as set out in the legislation and by-laws.

[1753] Participant G
[1754] Participant G.
[1755] Participant G.

Participant G held that they believe that municipalities have discretion but that developing by-laws is "very difficult because of the public consultation requirements, which require quite a legal process."[1756] The participant stated that this is why the Municipality's

> legal section told us it is easier for us not to develop our own by-law but to integrate it into other existing by-laws.[1757]

So, in terms of our legal perspective, the participant said that they were not sure how such a legal process works. When prodded on the use of a standard or model draft by-law provided by someone else, the participant agreed on the feasibility of such an approach and thought that there was space for that within their municipality as long as it is a complete by-law that was already drafted

Participant initially just responded "No, not if it is in contravention with SPLUMA"[1758] but after coaxing, the participant elaborated that if it's in alignment with SPLUMA, then they do have such a discretion. They then went on to say they have

> some sections within the by-law that clearly indicate that it is to the discretion of the Municipality to request additional information, while maybe the customised want to just give us a few points and then we just add it on. So, if it does not contravene in any way whatsoever, with SPLUMA and other relevant legislation, then it is the discretion of the Municipality to request.[1759]

Participant J indicated that to their knowledge, "SPLUMA and the regulations of SPLUMA do make provision for the municipalities to do that." The participant also indicated that this discretion is subject to not being in conflict or contradicting SPLUMA and its Regulations. The participant went further in stating that municipalities accordingly may "insert certain things that will let them be more specific relating to that city or that province"[1760] while staying within the framework of the national legislation.

[1756] Participant H.
[1757] Participant H.
[1758] Participant I.
[1759] Participant I.
[1760] Participant J.

Participant K did not understand the question and asked the researcher to explain the question further so that they could elaborate. After having done so, the participant responded that they think municipalities do have the discretion to include other things in their by-laws "as long as it is not against the set standards of the legislation, and it will complement such."[1761] They then explained that, as the Municipality has an interest in safeguarding the environment and "must do something about climate change given the current existing legislation,"[1762] that the Municipality can draw from other sector-specific environmental instruments, such as air quality or waste, to try and develop something around climate resilience.

5.4.8.3 Amendments

When responding to the question of possible amendments to the current by-laws or whether a separate by-law was preferred, Participant A stated that they can do both, adding amendments to existing by-laws or drafting a separate by-law for urban climate resilience. They indicated that they could amend the current ones because they are already in existence, and it would be easier to amend them than to draft an entirely new by-law. They elaborated that if there were gaps in terms of dealing with climate change in the by-law, they could add in those gaps, but they indicated that, if there are things that are not covered and require more clarity and detail, they would rather put it in a separate by-law.

Participant B commented that regarding amendments, they had to reconsider their by-law as they did not take climate change into consideration at all. The participant also stated that in their land use scheme, climate change was also not considered. The reason the participant provided was that it was not part of their thinking and that "they are not there yet in terms of their by-law". The participant placed the blame at the feet of the environmental department, as "they are not driving it, and it is not coming from somewhere". The participant indicated, however, that they could have put something in their land use scheme or even the by-law and suggested they could include incentives. As such, the participant said, "'There's

[1761] Participant K.
[1762] Participant K.

definitely space for it."[1763] The participant then went on to say that, since their environmental management department does not have legal standing or environmental legislation, they think 'that a by-law specifically for the environmental department is needed to give them teeth.

Participant C established that they thought there was space for amendments within their own by-law as it touched the surface and that "for it not to remain blurred and hidden under other agendas, [these aspects] need to come out more clearly."[1764] They elaborated that one should see climate resilience as a chapter or a separate subheading to ensure that it is clear and not implied as it currently is, as climate change is increasing and "no longer something to leave to chance."[1765]

Participant D responded that they could recommend both amendments to existing by-laws, or the development of a separate by-law to deal with climate change issues and urban climate resilience, as each has positive aspects. According to the participant, the primary competence in the SPLUM by-laws related to planning, which they argued allowed control over the avenues which one wanted to influence. From a climate resilience perspective, they argued, it might be good to have it as part of established by-laws, as they are already fully functional and in line with SPLUMA, which arguably carries a lot of authority. Notwithstanding, they submitted that formulating a stand-alone by-law for urban climate resilience might, in some instances, be considered preferable as it can create awareness and start developing and entrenching the concept within the legal discourse without running the risk of diluting it and causing it to be derivative to the SPLUM by-laws.

In furtherance of their response to the question of discretion, Participant E, reflected on the floods and landslides that hit KZN early in 2022, and affirmed that awareness and discussions on climate change and the integration thereof is expanding and that as a planner, being exposed to environmental issues, they did not see integration

[1763] Participant B.
[1764] Participant C.
[1765] Participant C.

of planning and climate resilience, even in their training. The participant then articulated

> I think the major, major shift should be trying to amalgamate the tool so that we understand what our role in a changing climate situation is. How do we plan better? What decisions do we need to enforce so that we are able to have the full picture, not a picture that has a separate segment that speaks to environmental issues.[1766]

Participant F advocated strongly for a separate by-law to deal with issues of climate change "so that we put a specific focus on it."[1767] The participant explained that a separate by-law would mean that people with the relevant expertise, knowledge and skills would be working on the aspects of climate change and urban climate resilience daily. Related to this, the participant pointed out that such separation will also mean more discretion in terms of what to include in such a by-law and leaves the responsible department to apply their minds and objectivity for applications that come their way. They indicated that such a specialised unit would still work in conjunction with the town planning department. Participant F also elaborated that despite having many laws in South Africa, there are many interlinkages and cross-references throughout the legislative framework, and it would be no different in separate by-laws as they should be aligned, not only with national legislation, but also with the other by-laws of a municipality. The participant said

> inasmuch as I am suggesting that there should be a specific by-law dealing with this issue, but literally, I'm not saying SPLUMA shouldn't have an aspect, at the high level, dealing with environmental issues.[1768]

Participant F further supported the enactment of a separate by-law and department dealing with issues of climate change and urban resilience, or the environment, as it would mean that when there are cases of non-compliance, the specialised department would have legislation to back the enforcement or implementation of the particular transgressions. The participant motivated their reasoning based on the premise that SPLUMA, on its own, would not be able to go into the necessary detail and deal with all possible solutions to environmental or climate change issues.

[1766] Participant E.
[1767] Participant F.
[1768] Participant F.

Participant G stated that they were content with their SPLUM by-laws as they consider them to fully address most matters. They mentioned specifically that the by-laws are trying to meet the environmental aspects. The participant named the environmental management department, the main role players in terms of combating urban climate resilience and elaborated that this department should ensure that the relevant by-laws are drafted, and that the enforcement section is included. The participant explained that there are sections that interlink with their by-laws, then they could assist in terms of, you know, trying to assist with complying with such. They further mentioned alignment, and that in such instances they may need to review to try and accommodate that section.

Participant H was unsure and said it would be difficult to say, stating

> But I would think that if we have a by-law just for us, it would be better for us to implement things.[1769]

The participant continued that perhaps once the Climate Change Bill was in effect it might be more feasible to consider making a separate by-law and that it would be a matter of how they went about drafting such a by-law and what sort of information they would include as they could run the risk that the information would be quite similar to the information that's currently existing in other by-laws.

Participant I opined that "the climate issue part should be aside."[1770] They stated that such a separate by-law could work together with the SPLUM by-laws, depending on the needs of the applicant, location, or specifications. In that way, they argue that the

> planning by-law remains the planning by-law. Then we have something on the environmental side for climate. That is my opinion. But then the by-law can direct that particular development to the by-law, like the climate by-law.[1771]

This meant that if development applications do not comply with the sections of the climate resilience by-law, they did not comply with the SPLUM by-laws.

[1769] Participant H.
[1770] Participant I.
[1771] Participant I.

Participant J stated that "climate should be something on its own."[1772] The participant added to this that

> Town planners, I do not think we're going to operate outside our scope of expertise, trying to address certain climate stuff.[1773]

Participant J added to this that, once there is a separate by-law, the Municipality could appoint an environmental specialist to perform certain functions within the Municipality. The participant argued that the SPLUM by-laws could mention the new separate environmental or climate change-related by-law to ensure alignment. The participant also alluded that environmental authorisations are done at a provincial level, who consider authorisation applications and issues environmental authorisations when all the relevant environmental impact assessments and basic scoping reports are submitted to them. Participant J indicated that the environmental section works closely with the provincial department regarding developments in the Municipality. Concerning the amendments part of the question, the participant indicated that they had a few amendments in mind but that they do not relate to anything climate but that they relate to

> taking away some of the red tape, making the application procedure quicker and easier for people to apply because it feels kind of like SPLUMA, and the by-laws are making everything more complicated, but I do not think that was the intention of SPLUMA, initially. But there are quite a few of the procedural requirements that people have to comply with now, which makes the town planning process quite draining…it strains the whole process.

Participant K pronounced that amendment of the existing by-laws are not necessarily the solution to current challenges, as they might not be "specific, per se" but that if they are amendable in a way that addresses climate change and urban climate resilience, such amendments could be made rather than developing new laws and by-laws. The participant noted that it is a process, but "if then we can amend the existing one per se, I think just to develop to try to fit it in."[1774] In spite of that, the participant went on to advocate for a separate by-law related to climate change and urban climate resilience, on the condition that the Municipality has the

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[1772] Participant J.
[1773] Participant J.
[1774] Participant K.

necessary human, skills and fiscal capacity to draft such a by-law, particularly if such a by-law would be beneficial for the Municipality.

5.4.9 Collaboration and intergovernmental relations

This section questioned the participants on the working relationship between municipal officials and the council, between the municipal officials from different departments, and the involvement of other stakeholders, such as the community, for example.

Participant A's response focused on the different roles of the officials and politicians within the Municipality, illustrating that initiation of by-law processes by either the administrative officials who they deem "the ones who start the whole processes in most cases" as they have the requisite knowledge and experience in the subject within the department. The participant also indicated that the by-law processes could be initiated by the politicians, but these are also the councillors who are in charge of approving and adopting the by-laws after it has gone through the different committees. Conversely, the participant also alluded to the initiation of by-laws from the community, through ward councillors, in relation to challenges they are experiencing. Thus, the participant alluded to the top-down and bottom-up initiation of by-laws. The participant, throughout the interview, also alluded to the collaboration and cooperation between different departments. The participant illustrated criticism against other departments, such as communications and the spatial planning and land use management departments, for "being effective…but not doing enough" in terms of educating the public and creating awareness and accessibility of the by-laws or of being "problematic… with a tendency of doing their own thing. I really don't get involved much."[1775] The participant mentioned further that in instances, there might be different departments that are affected, such as environmental management and that in these instances they would "go out together [to the site],"[1776] suggesting that their engagement with some departments is better than with others. Irrespective of these responses, they also stated that having

[1775] Participant A.
[1776] Participant A. Brackets added for contextual clarity.

different departments made it easier and that "working together is not a difficult thing. We really do work together."[1777] In some instances, such as the participant's involvement with the SPLUM by-laws (and other departments), most of the collaboration or engagement seemed to be through the circulation of documents for comments or input.

Participant B voiced their frustration with the quality of engagement from other departments within the Municipality, especially insofar as the circulation of documents for comments and inputs is concerned. Their criticism in this regard was that other departments were not doing their due diligence in providing inputs and comments, and either just stating that the document is in order or providing generic comments. The participant stated that the level of engagement is slightly better in terms of the SDF and the IDP. The participant indicated that the communities are involved in the processes and attend the public participations. Participant B indicated that, while they do try and engage with property associations and environmental groups, they do not consult with smaller groups. There is a level of blame shifting, especially on the environmental management department, that they are not driving the environmental objectives and vision within the Municipality and are neglecting their duties as interested and affected parties in the application process in terms of new developments. By way of example, Participant B allegorised that

> environmental health has legislation about pigs on holdings. So, I referred the complaint to them. The guy phoned me and said… I referred your problem/thing to environmental management because it smells. It is about smells. And it is air pollution, and what-what, so they must look at it. And I was astonished about the attitude. Not working together, I was attacked for sending it to the wrong department. So, there is some…what I observe, there's a thing between health and environmental management, a thin line, but they're making it a big gap, you know of who's responsible for what, you know, and I will not do your work.[1778]

As such, the participant indicated that there is a "big gap between land use management and environmental management."[1779] Participant B mentioned that the other departments might provide different insights, but that there is a lot more to

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[1777] Participant A.
[1778] Participant B.
[1779] Participant B.

be done. Participant B alluded to a mismatch between the spheres of government and emphasised again the capacity constraints:

> I think the Province and the environmental department need to wake up. I don't know. Why I'm saying Province is that we're a secondary municipality, we don't have resources. So, if we don't get assistance from the province or the national government, it's not going to happen. We're struggling with money, how are we going to tell our municipal council we want R 3 million because we want to develop these by-laws for climate change, they're going to laugh and say: "'there are bigger problems', you know, but this is actually a big problem. It's worsening.[1780]

The participant indicated that the relationship between the spatial planning department and the land use management department is good and that they consult and address the environmental concerns to an extent in terms of protecting wetlands and ecological areas.

Participant C's response indicated that while their department was responsible for the drafting of the by-law, all other relevant departments were involved in commenting and

> Every time the consultant came to do a report, we invited other departments within the Municipality to be present and render comments and that they were also required to render comments in writing after the report was written.[1781]

Participant C emphasised that this engagement was mandatory and that they would not have been able to have the by-law approved without the comments and inputs from the other departments. However, they stated that while the other departments participated, they did not do so adequately and that there was room for further improvements. The participant shared that

> If a department does not give comments within a certain specified period, we cannot wait for that, so their comments would be skipped if they did not do so in the required time.[1782]

In terms of community and stakeholder engagement, the participant responded that there was adequate public participation and that they are also invited to comment on by-laws. The participant explained that they took extra effort to communicate

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[1780] Participant B.
[1781] Participant C.
[1782] Participant C.

directly with the town planning consultants within the area and that anyone who submitted an application had also been notified via email, and meetings were held with them to get feedback and give input.

Participant C alluded to a good working relationship and collaboration and involvement with the community, consultants and other stakeholders and mentioned that the officials would go out to the community and that they followed a bottom-up approach to planning in the Municipality aimed at asking communities what they wanted and trying to incorporate these inputs into planning instruments, particularly the SDF and IDP of the Municipality. The participant also revealed that departments worked well together in respect of the pre-enquiries, where they collectively went through proposed applications, but that there were levels of political interference that hindered these processes. It came through in the interview that there was a disconnect between municipal officials in the different departments and councillors or management in the Municipality, as the participant cautiously alluded to some of the challenges in these relationships. These challenges included, among other, that there was political interference to benefit friends and family and to manipulate results of inquiries; cadre deployment leading to unqualified people in management positions; shortages of human and financial capacity; corruption and mishandling of municipal funds; instability and constant change of councillors or managers due to elections and office terms; inadequate performance management system that was not suitable for the work of all different departments, which lead to low morale, feelings that there was no recognition or encouragement. The participant established that these challenges all impede the implementation of projects and cause a disjuncture between the staff within the Municipality.

Participant D indicated that their department had a good relationship with the land use management department and that they had an "excellent understanding"[1783] and that they always try and assist that department in the interpretation of their by-laws, specific caselaw thereto, specific factual scenarios, and providing advice on the way forward. The participant stated that there is proper communication between

[1783] Participant D.

the departments, stakeholders, planners, and developers from the outside. The participant attributes this to the forums that they are a part of and suggests that their role is critical in terms of the MPTs and the appeal authorities, and that, as such, they are often called into the meetings of those departments to provide a legal synopsis. Participant D also stated that they work closely together with other stakeholders and that they perceive it to be a more functional environment under SPLUMA as opposed to how it was while using the ordinances. The participant also opined that

> nowadays it's completely different with SPLUMA, the planners can't function… function on their own. They need us… as the law is involved, they recognise us, as the law is involved.[1784]

However, Participant D contrasted this interdepartmental relationship and cooperation with the relationship with the political office bearers and management structures of the Municipality by stating that "from your councillor's side, from your public representative side, I think there is a big disconnect."[1785] They ascribed this to lack of proper understanding of the council members that serve on the committees that has to approve by-laws, and elaborates that "it comes down to trusting your officials" and acting only in the capacity required from them rather than trying to undermine or question the technocratic skills and expertise of the officials that draft by-laws. Participant D also alluded to a disconnect in certain instances that he attributes to a lack of synergy between the departments that results in a siloed approach within the Municipality, and not being able to intervene because they are from different departments, and that their department acts mostly in an advisory capacity. The discussion with the participant revealed a disjuncture in collaboration with or cooperation with other departments as the participant, from a legal perspective's side was not involved in the by-law drafting, for example and blamed this on lack of proper separation and understanding of roles and responsibilities of role players and not utilising the technocratic skills that are available in the Municipality.

[1784] Participant D.
[1785] Participant D.

Participant E divulged that they do not have a relationship with councillors in the drafting of the by-law, except when they must approve them, or where officials need to do reporting in terms of reporting on projects. Furthermore, the participant opines that "councillors are biased and will only be interested if it's a development that they like."[1786] The participant indicated that they do have good interdepartmental cooperation and collaboration with other municipal officials, and that the relevant departments are involved in an advisory capacity, and that they do engage with them through meetings and circulation of documents for inputs and comments. The participant mentioned that when circulating documents for comments, they do receive comments but that they question the quality of the information or inputs received that often clearly indicate that the other department did not apply their mind and that they did not see the proposed site for developments as this would reflect in their inputs and comments instead of just indicating that they had no objection.

In relation to the engagement with external stakeholders, the participant indicated that they circulate drafts of documents to the planners that normally submit applications to the Municipality, to say that they are in the process of reviewing their by-laws and to then ask for comments and inputs from the relevant stakeholders. Participant E also touched on engagement with the broader public and stated that they went through the process of advertising, putting the documents in municipal buildings for the public to make comments, and that they use the municipal website for that, but indicated that it not working. The participant attributed this to traditional methods of public participation being outdated and "really out of touch with the current world"[1787] and that they needed to use more up-to-date methods of sharing information and engaging with the community.

Participant E mentioned that with their spatial planning and land use management by-law, they have a provision that if they are proposing something, they have to inform the ward councillors for them to inform the people, and with that, the

[1786] Participant E.
[1787] Participant E.

assumption is that people will know about it as well. The participant elucidated that while some councillors did it, and they "don't want to take that away from them"[1788] there are others who just don't care.

Participant F affirmed that their municipality also uses the circulation method, where an application or documents, such as by-laws which are sent to respective specialised departments, which will then comment and check whether what is being proposed is accurate, and they will provide comments and inputs. The participant stated that the only way to achieve positive development is for the department within the Municipality not to work in silos. This required every department to comment after doing site inspections, however, the participant indicated that there are instances where a respective department neglected to do a proper assessment of the application, for example, but these instances are interrogated by the MPT. The participant provided that the reason for this might suggest that departments are merely providing comments for compliance purposes and are not doing their due diligence and applying their minds. While this hinders sufficient engagement, the participant indicates that they can still call such a person and request reasons for the comments and a site visit, which the participant revealed would often lead to withdrawal of the comments or visiting the sites and making informed decisions based on what they have seen. Participant F also alluded to the level of engagement between the Municipality and people from outside the Municipality, through their involvement in the MPT. The participant's response indicated a level of political interference as they mentioned the fact that politicians in office might try to interfere with the formal processes and considerations that apply to development applications, especially as far as favourable development from a political perspective is concerned. The participants' response also indicated a level of engagement with the environmental management department, stating that other departments need to heed warnings about hazardous developments off to severe flooding in the province. Despite political interference, Participant F highlighted that the politicians do listen to the officials with technical expertise and the advice they receive from

[1788] Participant E.

them. Throughout the discussion, the participant also placed an emphasis on education drives and good relationships with the community and stated that they work well in conjunction with other departments. The participant further alluded to the engagement with the community through public participation procedures. Participant F surmised the interests of groups like COGTA, the public, planners, architects, and the Department of Rural Development and states that the result of having so many stakeholders means that they advance their own views on what shape a by-law should take. The participant also commented that when receiving inputs, they should be incorporated if they make sense.

Participant G explained that with the introduction of SPLUMA, they have decisions that are professional and are guided by different professional aspects, as it has established relations between different departments in the Municipality, but especially between spatial planning, land use, and other forms of planning. The participant's response alluded to disagreements between two departments in the Municipality relating to which department should facilitate, manage, and enforce a particular clause and take accountability. The participant reflected that these departments should have worked together in terms of cooperative government, as one department might not have the requisite capacity or skills to enforce a clause by themselves. Participant G stated that they could unfortunately not intervene in the dispute as they were operating and mandated under different legislation, and as these are separate departments from that of the participant. In describing the working relationship, the participant admitted that while "it was the responsibility of two departments,"[1789] their department did most of the work. The participant goes on to say that they "had to submit it to the legal division for their scrutiny and endorsement."[1790] The participant indicated that there was a strong relationship between their department and other relevant departments. The participant continued that they

> wouldn't say we work well together… It's a matter of that because we, you know, during the revision of the by-laws, it was a matter of that we were supposed to do

[1789] Participant G.
[1790] Participant G.

> this exercise together. However, town planning ended up taking the lead, and you know, submitting the draft for their scrutiny because we felt like we were not receiving the necessary support or participation at that stage. So… maybe… I believe they also have their reason because we have the one legal division which deals with the entire, you know, municipality at large.[1791]

They described this lack of support as capacity issues and stated that, at the end of the day, they did assist and submit their input and comment accordingly. In terms of community involvement or engagement the participant felt that the engagement was sufficient as they advertised as required by law, which included advertisements in the local newspaper the municipal newspaper, notices on the notice boards on screens and on walls throughout the Municipality and in instances where projects required it, they would go to this specific community. The participant underscored the role of ward councillors and indicated that they have workshops with these ward councillors in the hope that they will transfer the information to the relevant communities, as the responsibility of conveying the message is their responsibility and for what they get paid.

Participant H opined that they had a good working relationship with other personnel from the Municipality, and if they needed information or assistance, there were certain people who they knew would assist them. Participant H elaborated on the level of engagement with other departments in considering or commenting on development applications, indicating that if they deemed something on site concerning, they would add it to their comments and, if necessary, visit the site to ensure that their comments are factually correct. In some instances, the participant explained, other departments might take issue with their comments and inputs, such as, for example,

> if someone wants to develop on an open space and most of the time, it's like… dumping is happening on a site, we'd say even though this dumping is happening on the site, it's an open space. We've taken a stance on not letting it go. They want to know, it's degraded, why are you keeping this? And then we have to explain why are we keeping this?[1792]

[1791] Participant G.
[1792] Participant H.

Participant H, further, described the work of their department as cross-cutting and that they are cautious not to step on other people's toes. The participant indicated further engagement issues within the Municipality, with certain units not responding to inquiries, making it very hard to obtain necessary information from them or get them to assist. The participant indicated that, in such circumstances, they would have to go to management to obtain the necessary information. The participant also noted difficulty with constant changes in municipal staff with people leaving, retiring, people being on sick leave, or maternity leave, and other departments not being aware that these individuals are absent, meaning to find the relevant information elsewhere. During the interview, the participant alluded to the engagement with the legal department regarding the feasibility of a by-law for environmental management, for example, and was advised (at the time) that it would be more feasible to include aspects of greening into existing by-laws of other departments. This is contrary to what was revealed in another interview that diverges from this information in that legal services indicated a preference for a separate by-law while this participant indicated that they had received different advice from colleagues in that department, who they indicated had since left the Municipality.

Participant I's responses indicated that the Municipality struggle with issues of land invasions, where communities would later request municipal services and infringe on protected or hazardous land, which strains the relationship with the Municipality as the Municipality is held accountable and must provide solutions. This relationship is further strained due to misconceptions that the communities have regarding how much land the Municipality has, and the Municipality struggles because they cannot move them from such hazardous areas, as these land invaders have built immovable property in flood line zones, etc. However, the participant alludes to a good albeit difficult relationship with traditional authorities, with which they have regular engagement and consultative sessions. According to the participant, the difficulty in working with traditional authorities stems from their self-appointed power over the demarcation of stands or land. In relation to the traditional authorities, the participant also emphasised the importance of education as a local environmental

governance instrument. Participant I's responses also illustrate, from the education and awareness raising perspective, a persistent effort of engagement and involvement with the community and traditional authorities from the Municipality's side through public participation, workshops, and discussions with them on land development, studies that may be required for development on their land to avoid any natural disasters, or legal implications. The participant mentioned that the traditional authorities were wary of engaging with the Municipality in the beginning due to fears that the Municipality would take their land and develop whatever they wanted. The participant explained that they approached the engagement with traditional authorities and communities in phases and that they were cautious to induct workshops and engagements on a regular basis. Participant I enunciated that the relationship could be challenging, as the traditional authorities could be impatient and

> they may end up being very angry at us because of the correct channel that we have to follow, however, it's a very lengthy process. When we explain the lengthiness of the processes that they must undergo to avoid planning defects, they get very angry.[1793]

Throughout the discussion, the participant also mentions that they consult with other departments and a range of stakeholders when drafting by-laws or other documents. Furthermore, the participant's responses reflected a good relationship with the legal department and council committees to which these are sent for compliance. This process is also subjected to public participation processes and engagement with service providers, and the participant referred to pre-consultations that are also required before developers or prospective applicants are required to do. Much like the pre-consultations, the participant indicated that before they had reviewed the by-law, they were required to engage in readiness meetings, with everybody inside the committee, working with that by-law.

> So, we would have to meet every month. We would have external reviewers; we would invite all of those units for meetings, and under attendance, would sit the inspector who would reward the drafting or all the finalisation of this by-law and how they factor in there. So, our relationship was very satisfactory with the others.

[1793] Participant I.

Participant J indicated that they would arrange meetings and workshops, if, for example, they were doing a new policy, which might in some cases include consultant presentations, and all relevant departments would be invited to attend, or they would circulate it to some of our departments depending on what type of application it is. The participant confirmed that there is a working relationship between the different departments within the Municipality. As to their sufficiency, Participant J stated that it is, but "there's always room for improvement."[1794] The participant highlighted that one of the aspects which could be improved pertained to attendance. However, the participant suggests information sharing as an alternative, explaining that

> If I attend, for example, if I attend a meeting on something, then I always think to share that information with my manager and my supervisor, or colleagues within the department. I'm not sure if it happens in other departments or if it doesn't happen, I can't say. Then, I think maybe it could be better just to… just for you… If you just send an email with an attachment, just to say, please take note, or for your information.[1795]

In terms of policy drafting, the participant mentions that the spatial planning department sends out advertisements for public participation, goes to the traditional councils to do consultation with them, and they do presentations on the policy. From a land use perspective, the participant noted, "I'm not sure… there's public coming in and out the whole time. We are here to consult with them."[1796] In the same vein, the participant included that they try to communicate with their consultants as much as possible via e-mail, and they specifically mentioned the pre-consultation process that they must partake in with town planners, applicants, and developers.

> So, there are certain applications that are specified in the by-law that an applicant has to do a pre-consultation with the Municipality. So, we have that relationship of we invite… if necessary, we invite them to a meeting to discuss the concept and to advise them that this is 1, 2, 3, and 4, which is wrong. Or it's fine, you can apply.[1797]

[1794] Participant J.
[1795] Participant J.
[1796] Participant J.
[1797] Participant J.

Participant K argued that the relationship with people from different sub-units and departments was not an easy one. The participant had a similar opinion on the relationship between officials and councillors, especially when new councillors who take up office undo the last term's hard work and progress made. The participant stated that one of the challenges was that

> They come, new ones… you have to start afresh. They can say no, no, no, this one was developed by those ones [previous office bearers], we don't want them. No. Start afresh.[1798]

The participant also mentions that they are part of a forum where they include other sub-units and people from other departments, from academia, and other stakeholders to discuss different policies and "that's where they will be able to discuss them and give some inputs and the expertise."[1799] Moreover, the participant emphasised the importance of reaching out to the community, especially those in the more rural areas that often do not feel included in the Municipality. The participant indicated that they are attempting to make a conscious effort to take services to those areas.

In respect of their relationship with consultants, Participant K considered it to be a good working relationship

> because if we disagree with… we'll agree to say we don't agree on this because this is the document that we've been left with us, we are the ones who will be using it, and we'll be gone with they will be gone with the million… so value for money, whatever we give you must deliver.[1800]

5.5 Analysis of participant inputs

5.5.1 Training and work experience

All participants considered their tertiary education as well as continuous self-improvement or development through at least some form of postgraduate education, certification, diploma, or participation in professional forums, tribunals or authorities, as training that in some way or form enables them to fulfil the

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[1798] Participant K. Brackets added for contextual clarity.
[1799] Participant K.
[1800] Participant K.

requirements and duties of their positions within the Municipality. It is alluded that all participants have the requisite degrees and experience for the positions they hold. Furthermore, most participants (7 out of 11 participants) indicated a lack of training hosted or facilitated by the Municipality as it relates to the performance of their duties and functions. This is particularly problematic in instances where a department is expected to draft a policy document, by-law or other instrument in their specialised field without the know-how and adequate training or assistance. As stated above, these officials often must rely on themselves and their own initiative or resourcefulness to be able to perform their duties. An observation can be made in terms of the status quo of training in the specific municipalities that the overall perception of the lack of training opportunities or the provision thereof can differ from municipality to municipality, but is relatively accurate based on the participant responses. The only discrepancy was in Municipality A, where three of the participants indicated a lack of training opportunities facilitated by and within the Municipality, while the other participant indicated that there were training opportunities. There is also a willingness to learn, further their knowledge and improve their development and experience through either part-taking in training opportunities such as seminars, workshops and so forth, as the majority of the participants (10 out of the 11 participants) either indicated an interest in training, furthered their studies by doing postgraduate degrees, or obtaining supplementary knowledge externally. With the changes that SPLUMA brought forth and the responses in relation to that in particular, one can also argue that there is a level of adaptability within the officials or departments themselves as they seem to navigate the challenges and deal with the nuances of their respective portfolios in stride, despite not receiving adequate training support from the municipality, with many participants using their initiative to better equip themselves and to improve their ability to perform their duties effectively.

5.5.2 Duty or responsibility to respond to the effects of climate change and urban climate resilience

Though all participants agreed that municipalities had a duty and responsibility to respond to the effects of climate change and urban climate resilience, they had a

range of different views in terms of what such duty entailed and required from them as officials or from the municipality.

The data collected and analysed shows that one of the key considerations in terms of this apparent duty relates to the competency of relevant departments to take responsibility for, and to implement the necessary mechanisms that the competency allows for, if the duty is to be achieved. This means also that participants see a further need for the proper functioning and management of the different sector departments or units, and properly and effectively utilising the tools or instruments at the disposal of the municipality, as well as compliance with these instruments and what they require municipalities to do. Most participants (ten of the 11 participants) made statements to this effect, while one of the 10 referred merely to capacity building in the municipality. As there was mention of competency and proper instruments and mechanisms, the researcher decided to group the response here, although the researcher is aware that it could also relate to training and budgetary capacity, as mentioned elsewhere in this section.

Another key consideration or concern that is common in the participant responses is the lack of and need for sector-specific local-level legislation stipulating requirements for compliance, to guide and stipulate processes and functions of the municipality relating to the authorisation and development studies required for development applications. The consensus at the time of the interviews indicated a need for sectoral, environmental, or climate change-specific by-laws or instruments that are legally enforceable, or at the very least guidance in terms of which sector-specific information to include in instruments that other departments are expected to draft and adopt. This is linked to intergovernmental cooperation and collaboration, which has also been identified as an area for concern by six of the participants. Based on an analysis of the responses, this cooperation would be required both vertically between the different spheres of government[1801] and horizontally between the different line departments or business units. While only

[1801] National, provincial and local government levels.

one of the six participants explicitly named the method[1802] of cooperating within the different departments, this is evidently a preferred method amongst municipalities. This method of sending documents to other departments for their guidance or input in the form of comments is customary practice in the municipalities, but it requires a commitment to actively engage with and respond to these requests and give proper feedback, guidance or input. It also pertains to due consideration of any inputs or comments received, so that informed and just decision-making and considerations can take place, in instances that authorisations, applications, conditions, or inclusion of comments can be made. This prompts also the age-old struggle of municipal departments working in silos and not contributing effectively to cooperative governance.[1803] Additionally, some participants mentioned that when cooperation from other departments is deemed inadequate, they can request reasons and site visits to find out why a certain comment has been made or left out.

An additional consideration, highlighted by four of the 11 participants' responses,[1804] is that local governments are the first level of government affected and expected to respond,[1805] which requires them to have the necessary training and skills to be able to fulfil their duty to respond to climate events and urban climate resilience, especially as it relates to the involvement of planning officials.[1806]

Another key concern, based on the responses, seems to relate to human and financial capacity. Three participants highlighted that they could not perform their duties as they did not have proper funding for projects or initiatives relating to their duties as dealt with in this section. One of the three mentioned that in the case of

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[1802] "Circulation" is merely the method employed whereby municipalities send documents on application considerations, draft policy documents, by-laws, etc., for consideration and comment by other departments.

[1803] This will also become evident in para 5.5.7 where the researcher attempts to gauge the efficacy of and ease of departments with other departments, external stakeholders and consultants, for example.

[1804] See para 5.4.2 above.

[1805] See para 5.4.2 above.

[1806] This links back to the importance of training and continuous learning, and knowledge development. Furthermore, Participant E's response recorded that capacity building should be considered, which can also be included in this, as training and continuous professional development can also be classified as capacity building. See also para 5.5.1 above.

disaster striking, where people are displaced, support is required, and infrastructure is disrupted, a lot of money goes into investing in infrastructure, meaning that capacity building within the municipality is important. Another participant highlighted budgetary concerns in relation to the performance of their duty, is where they do not have the capacity within the municipality to draft and formulate required policy instruments or by-laws, for example, and have to hire an external consultant to assist the municipality, they often do not have funds or budget allocations to do so. This participant did, however, also elaborate on interventions within their municipality that have the potential to bring external funding in through certain initiatives and competitions that municipalities can enter or participate in to create additional revenue streams that are either project or department-specific and cannot be earmarked for other municipal expenses. In a different question's response, one participant also described by-law making as an expensive exercise, also alluding to budgetary challenges municipalities face.

The penultimate observation from the participant responses is that there is a great need for enforcement (where by-laws, LUS or other legislation is concerned) and implementation (in the case of policy documents and plans). The responses also indicate that strict compliance with by-laws and imposed conditions on authorisations and applications, as well as compliance notices, is needed.

An outlier response was that the duty on municipalities required proactive instead of reactive responses to climate change effects and urban climate resilience, which is confirmed throughout the literature study in Chapter two of the study.[1807]

5.5.3 Legislative and executive authority to contribute to the national effort to address climate change

With respect to the aim of the relevant question to gauge the knowledge and perceptions of how participants considered the legislative and executive authority of municipalities to contribute to the national efforts to address climate change, the researcher got such a diverging set of responses, with few participants addressing

[1807] See para 2.2 above.

the question in full. This may be indicative of phrasing issues with the question itself and how it was posed to participants, as the researcher was asked to repeat or rephrase the question or was asked for clarity in terms of a part or whole of the question. This could be ascribed to the unavoidable use of legal and climate change jargon that the researcher had to employ, which the participants might not have been familiar with.

Nevertheless, it appears from the participant responses that one of the 11 participants did not fully comprehend the question but attempted to answer anyway. These answers made no mention of the executive authority of the municipality and how it can contribute to national efforts to address climate change, nor did they touch on the legislative authority in terms of by-law making and their potential to contribute.[1808] The response was limited to performance management and achieving set targets that are in line with the plans of the municipality, and how these targets and achievements or lack thereof, are reported to the municipal council and other spheres of government to initiate intervention where necessary.

Two participants responded to only a portion of the question posed. One of these participants highlighted the plight of the internal processes of the municipality and underscored their inefficiency in realising the legislative and executive authority bestowed on municipalities to effectively address issues and contribute to the broader scope of the national effort to address climate change. The other of the two answered the legislative part quite comprehensively and included mention of planning instruments, the legislative requirements that municipalities must meet when exercising this authority and illustrated awareness of the national law and policy framework which the municipality must consider when drafting their own legislation and aligning their instruments with those at a national and provincial level. The rest of the response consisted of criticism against the municipality's internal structures, procedures and challenges that are faced in that environment.

[1808] See para 3.4 above.

One of the other participants in the study admitted that they were unaware of the commitments that the national government made in terms of climate change, though they mentioned some of the instruments on which these commitments are made in an earlier instance. This participant's response was an outlier in that it contended that enforcement should only happen from the top-down as failure to do so will lead to failure from a bottom-up approach.

Five of the participants gave more or less corresponding responses. There are distinct similarities when the responses are analysed. Two of these responses consider education and awareness to be paramount in addressing climate change through municipal instruments, such as by-laws, with one underscoring the importance of the by-law being simple and clear enough for those in the community to understand. The two responses also both have responses indicating the need for municipal legislative authority to be guided by national and provincial legislation, and places a heavy emphasis on the importance of compliance and enforcement. The other three responses from the group of 5 all indicate the need for municipalities to be able to have an element of control in terms of what they legislate as it equips them to function optimally and contribute on a functional level, while also having the freedom to tailor the by-laws and policies to the needs and circumstances of the relevant municipality.

The last two responses focus more on what the municipalities need to realise and exercise their legislative and executive authority in terms of contributing to the national efforts towards addressing climate change.

5.5.4 Use and knowledge of governing tools

This question was also likely problematic due to the phrasing and verbose nature of the question aimed at ascertaining the participants' knowledge on the use and relevance of the range of local environmental governance (LEG) tools and to find out their opinions on the effectiveness of these instruments. Ten out of the 11 participants opted to answer anyway, with only one indicating that they would prefer to circle back to it at a later stage. The researcher observed that some participants had knowledge of and mentioned some of the mechanisms included in the

instruments in question without necessarily knowing that they did so, not only in this question but also in others. Even the participant who opted to skip the question and return to it, at some point during the interview, made mention of such instruments. As such, those responses were also recorded above.

From the responses above, it is ascertained that command-and-control instruments are the most preferable instruments to use, as was mentioned directly or indirectly by all participants. Eight participants mentioned by-laws and enforcement as effective mechanisms. Six participants also included implementation as an important part of command-and-control instruments. One participant who mentioned by-laws, enforcement, and implementation, however, stated a preference for education above command-and-control instruments, feeling that it should be used as a last resort, unless dealing with big corporations that transgress, in which case they will be charged. Another stated that all instruments would work if used correctly, but only related the discussion to command-and-control instruments. Another one of the 11 participants also primarily discussed command-and-control instruments, with a brief mention of agreement-based instruments, but stated that these instruments are not used effectively.

Nevertheless, there is an apparent esteem for education and other types of civil-based instruments. A total of six participants mentioned and elaborated on the education/awareness and capacity-building instruments within the respective municipalities, with three of the six participants stating this as the most effective or preferred instrument. Other civil-based instruments relating to, for example, stakeholder engagement,[1809] information dissemination,[1810] and public participation[1811] mechanisms were also mentioned throughout the responses, but to a lesser extent than education or awareness.

With regard to incentive-based instruments, six participants mentioned incentives, with one of these viewing it as inferior to civil-based instruments. Seven participants

[1809] Five out of 11 participants.
[1810] Four out of 11 participants.
[1811] Three out of 11 participants.

referred to types of disincentives, with two of these responses being conditional. One of the two outliers indicated that the fines that were used as disincentives were inadequate as the monetary fine is too small to dissuade non-compliance and it therefore becoming ineffective. The other outlier response was conditioned to only apply such disincentives in cases where the non-compliance was effectuated by big corporations, but that the community or individuals from the community would first be educated and made aware of the transgression before they were penalised.

Although seven participants mentioned agreement-based instruments, it is apparent from the responses that this instrument is not that popular and that they do not have enough knowledge about it. Six of the responses considered were vague and did not elaborate on examples. One of these responses mentioned a partnership of sorts that fell through and was never revisited due to the impacts of the pandemic. One participant stated they are convinced that their municipality has such agreements, but that they are not privy to them. Only one of the seven participants elaborated and considered the effectiveness of agreements, but concluded that these are open to abuse and were not being implemented effectively, and as a result would not work.

5.5.5 SPLUM by-laws and urban climate resilience

Based on the participant responses, it is deduced that the question was not properly formulated. This could be due to several reasons including the inevitable use of jargon, foreign concepts, or theoretical notions for things ordinarily understood in more practical terms; inadequate knowledge of the participants in terms of the features of urban climate resilience as the researcher attempted to describe; and participants being from departments that did not deal with or have a frame of reference to answer this question. It must also be noted that the interviews of the empirical research were conducted before the researcher had properly distilled the best-suited typology for the features identified in Chapter two, and hence, the interviews might have been too premature in relation to the research at that point in the study. Upon reflection, the researcher also had to phrase the question differently as not all participants were part of the spatial planning and land use

management departments, and as such, this could also have affected the outcome or analysis of the responses. For reference and context, the original question posed to participants asked: Do you think that SPLUM by-laws can be used to promote urban climate resilience? In certain instances, "SPLUM by-laws" were replaced by "municipal by-laws" to accommodate the participants not working within the planning departments in whatever form that takes in each municipality. This question was followed by a brief mention of the features relating to all the intersecting sectors, so environment, socioeconomic governance and infrastructure. The researcher repeated the question after giving them the additional background or context of the features.

The responses varied significantly for this section, as stated above. However, eight of the 11 participants affirmed that by-laws (either generally or as they pertain to spatial planning and land use management). Only four of these mentioned by-laws and elaborated on how or why they can be used to promote urban climate resilience. These participants had some interesting views and suggestions of how by-laws can promote urban climate resilience, such as including components of the features is the design requirements in the by-law, using and realising the potential of by-laws as tools with far reaching effects through elaborating on the enforcement and compliance aspects thereof to achieve the municipality's own envisioned outcomes. Additionally, among the responses, participants identified where there was room for improvement and listed challenges relating to the use of by-laws.

The other four participants mentioned by-laws but did not make mention of how or why they could be used for promoting urban climate resilience. Instead, this group of participants, while vaguely mentioning by-laws, did not explain how or what their reasoning was in terms of the features of urban climate resilience. One participant in this group mentioned that the by-laws for this purpose should rather fall to another department and that they were not convinced or sure that their by-law could contribute to the features at hand. The same participant also focused the majority of their response on the relevance of the SDF instead of the by-laws. Another participant in this group mentioned that by-laws could help but then listed all the challenges that made the use and implementation thereof difficult, indicating

perhaps that there is not a problem with the use of the by-law per se, but in order for it to benefit urban climate resilience and the features thereof, the system within which it operates should be addressed first as all challenges raised were valid. The other two in this category shift the focus not from by-laws but from the relevance for urban climate resilience and go into detail on the procedural aspects and considerations to be made when applications are done.

Further to this, three participants did not mention by-laws or did so very fleetingly and vaguely, focusing instead on either the SDF and how that could be used, or touching only on why the features are relevant considerations, or the applicable application procedures. This indicates that the question might not have been appropriate in all instances. One participant in this group mentioned only the SDF despite the researcher's efforts to link the discussion to where by-laws fit into their discussion on the SDF. Another participant in this group mentioned the features as considerations in decision-making on applications, but did not link them to by-laws in any way.

5.5.6 Status of the spatial planning and land use management by-law

Under this section, the aim was firstly to determine whether municipalities had SPLUM by-laws and how recent or up to date they were, as well as what participants understood to be contained in these by-laws. This question was not suitable for all participants and had to be restructured for participants who were not within the planning departments. However, upon reflection, it seems that all participants ought to have been able to respond even in a general sense. It was mentioned several times over the course of the interviews by four of the participants that they were required to act in an advisory capacity or as part of the circulation process that all three municipalities have in place, to comment on and provide input on the policy and legislative documents of other departments. This could reflect that these processes are not adhered to, and that cooperation and collaboration do not take place in a meaningful way or are inadequate.

However, from the data, it can be deduced that all three municipalities have SPLUM by-laws, and at the time of the interviews in 2022, these could have been considered

recent as they were not yet due for the 5-year review. Eight out of 11 participants indicated awareness of the existence of such a by-law, and seven of them included mention of the most recent in terms of the year it was published. Furthermore, six of the eight gave an overview of the contents of these by-laws, while two did not address that part of the question. It must be noted that one participant did not address the question as it relates to the spatial planning and land use management by-law, but instead, just as in a previous question, focused the response mainly on SDFs without acknowledging the relevant by-law until prompted on their knowledge pertaining to the content of the by-law, specifically. The participant then went on to say that it was a procedural document putting forth the procedures for applications, the function and overview of the MPT.

The data for two of the participants were not directly related to the SPLUM by-laws as these participants operate within a different department in their respective municipalities. As mentioned above, the questions were slightly altered to speak more to their knowledge and expertise in their departments. Both participants' responses reflected that their departments did not have their own by-laws and that they depend on other instruments provided for in legislation, such as plans, policies, frameworks and strategies. In many instances, these documents deal either directly or indirectly with climate change mitigation or adaptation responses and have the potential to contribute greatly to urban climate resilience in their municipalities, but there are certain challenges hampering them from reaching such potential.

5.5.7 Involvement in drafting and implementation of by-laws

This section questioned the participants' involvement in the drafting of the spatial planning and land use management by-law of each municipality. The questions were once again generalised for the participants who are not directly involved in a planning department. They opted to answer in general terms, and their responses were also noted despite being slightly different from the rest.

It appears from the data that six out of 11 participants were involved in the drafting and formulation of the SPLUM by-laws. Two of these participants were also involved in the review of the by-laws of their department. Another participant indicated that

they were part of the review process of the by-law but were not involved in the original drafting of the document.

Four participants indicated that although they are not involved in the drafting or review processes, they do still interact with the departments responsible for drafting and reviewing the by-law, but that they were only involved in an advisory or commenting role where they are required to make comments or give inputs on by-laws. In one of these instances, the comments and advisory role extends to involvement (in an advisory capacity) in development applications, rezoning applications, and even building plans.

One participant's responses were not in line with the majority of the responses, as they indicated no involvement in the drafting, review, commenting or advising, or any other involvement.

Three participants indicated that the department had a consultant or external service provider who was supposed to facilitate and guide the drafting process. Two of the participants indicated that they worked with the consultant to draft the majority of the by-law, and when the consultant's contract expired, they could finalise the by-law on their own. The other indicated that the service provider made a mess and that they then had to step in and try to rectify the mistakes made.

Interestingly, three participants referred to draft example documents from the provincial department to guide them in drafting their by-laws, which likely references standard draft by-laws.

Two participants noted other involvement that is not linked to the drafting or review process required in terms of by-laws, but related more to research and reporting involvement.

5.5.8 Specific requirements, discretion and amendments

5.5.8.1 Specific requirements for by-law drafting and content

Eight out of 11 participants showed awareness of considerations in terms of drafting, commenting on and editing of by-laws, and specific requirements in terms of SPLUMA to be included in the by-laws.

One participant elected not to answer this question. The remaining two participants' responses indicate that they either misunderstood the question or were not aware of the specific requirements for SPLUM by-laws as stipulated in SPLUMA. One of these participants was not situated in a spatial planning or land use management department of the municipality. This participant was asked the same question, but the researcher had to alter the question to speak more generally to the participant's expertise and area of specialisation in the municipality. The participant, in this instance, discussed considerations or requirements their department has to follow when considering applications and mentioned that they checked for compliance with national legislation, and that they act in a consultative manner when engaging with the planning department.

The other divergent participant's answer reflected the regulatory requirements rather than the content requirements. It is noted that the participant did allude to timeframes as an important factor, as it is the only requirement they based the response on. While in this question, they did not adequately address the requirements, the participant does have knowledge of what the by-law requires, as they referenced some of these throughout the interview in other responses. This might show that they did not understand the question properly.

5.5.8.2 Discretionary power on what to include in by-laws

In terms of the question applicable to this section, the responses indicated that nine out of 11 participants believed municipalities had a discretion in terms of what to include in their municipal by-laws. Most participants[1812] had similar responses

[1812] Eight out of the nine participants.

declaring that the discretion of municipalities to include other aspects in their SPLUM by-laws, or municipal by-laws in general, pertained to the local contexts and specific needs and circumstances of each municipality. These participants also caveated their response by stating that the discretion extended to by-laws only as long as it is not contrary to the national legislation and does not impede the mandates of other spheres of government and stays within their municipal mandates as dictated by the Constitution. The last participant's (out of the nine believing that municipalities had such discretion) response could be considered contradictory to one of the responses the participants offered for the previous section. This participant, in their response to the previous question, questioned whether SPLUMA intended for every municipality to have their own by-law, as this went against the purpose of SPLUMA of uniformity and that they thought that other instruments such as policy or frameworks ought to cater for the specific circumstances in a municipality and that the by-law should extend only to procedures, zoning, and enforcement. In their response to the question relevant to this section, however, they indicated that they had used discretion in their by-law to make it specific to their circumstances and how they wanted to handle things in their municipality, and then alluding again that policy (environmental policy in particular) ought to be used to substantiate the by-laws and that the by-laws did not really provide for such. The participant's response could indicate that they were confused or conflicted in terms of their personal frame of reference in terms of how the law works and the possibilities of going beyond that belief as our discussion progressed.

The last of the participants,[1813] either did not seem to understand the question or give it much thought. One of the participants mentioned only the regulatory requirements, such as timeframes and gaps in their by-laws that they identified, and that such discretion does not necessarily extend to climate resilience and only refers to the environmental studies that may be required in the application process. The other participant mentioned only the regulatory discretion allowed for in SPLUMA to request additional information for consideration of applications.

[1813] Two out of nine participants.

5.5.8.3 Amendments

The question for this section was aimed at determining whether the participants would recommend amendments pertaining to urban climate resilience or aspects of climate change to be included in their SPLUM by-laws, or whether they felt that a separate by-law dealing with these issues was necessary or preferable.

Seven participants out of 11 responses indicated a willingness to amend their existing SPLUM by-laws to include aspects of urban climate resilience and other responses to climate change issues. Conversely, five of these participants indicated that they were in favour of either or both amendments or a separate by-law dealing with the issues at hand. Three of these responses mentioned that while they do see the potential for amendments in their existing by-laws, a separate and specialised by-law for the environmental department or for climate change issues and urban climate resilience may be equally beneficial. Some of the benefits these participants allude to include giving the department that would be responsible for such matters an enforcement mechanism to ensure compliance, creating awareness and developing and entrenching the concepts, prevent it from being derivative and diluted in another by-law that would detract on the concepts and overshadow it, if there is too much substance that it would better be suited to a separate specialised by-law. From the remaining two out of the five responses, one linked the potential for a separate by-law to the human, skill and financial capacity of a municipality and suggested that if the capacity is there, it would be more beneficial to enact a separate by-law. The other participant's response emphasises the alignment of by-laws, and the response shows that the issues could be addressed in separate by-laws, with both referring to the other and linking them in such a way that non-compliance with sections in one could mean non-compliance with the other. The remaining two out of the seven responses indicate a preference for amendments to be made, with both responses indicating that the participants truly see the potential of improving their existing by-laws and both underscoring the role of planning in achieving urban climate resilience and the importance of integration and amalgamation of tools to be able to plan better.

Four out of 11 participants' responses showed a preference for establishing separate by-laws dealing specifically with issues of climate change and urban climate resilience. Two of these relate their responses to expertise that would go into such by-laws, and having such expertise to deal with these issues daily, and departments each operating within their mandates. Both responses emphasise the continued collaboration and integration or alignment of the two separate by-laws. One of the two remaining responses places the responsibility of such separate by-law at the feet of the environmental department, stating that while they could accommodate mention of such by-law and ensuring that their by-laws are aligned, they were content with the content of their by-law and saw no need for amendment to include issues such as urban climate resilience. The last response showed caution and indicated that the then still Climate Change Bill's enactment could provide more clarity but that such a separate by-law could be feasible as it would assist in implementation and enforcement, but that the legal services department had advised them to rather green and integrate with other by-laws. This response is interesting as another participant indicated a preference for such by-law to be developed from a legal perspective.

5.5.9 Collaboration and intergovernmental relations

As alluded to above,[1814] this section set out to determine the level of collaboration and intergovernmental relations between the different line departments with the municipalities, between the council and the administrative officials, between the officials and the communities, and lastly between the municipalities and other external stakeholders. As such, the question as mentioned above,[1815] was used to gauge the participants' perspectives of these relationships, but the researcher also considered previous responses and statements made to discern what these relationships and the collaborative and intergovernmental and interdepartmental relations looked like to test their responses.

[1814] See para 5.4.9 above.
[1815] See para 5.4.9 above.

The participants had diverse responses to the question relevant to this section, each providing their perspective and revealing their biases, making it difficult to assess the reality of the collaboration and intergovernmental relations within the municipalities. Every participant addressed the relationship with other departments, which is not surprising as this is the main theme of this section and the enquiry required. However, only six participants referred directly to the role of or relationship with councillors or "the politicians" in office. Four participants mentioned the relationships between their departments and external stakeholders such as consultants, service providers, property associations, and environmental groups. Eight participants made specific reference to the community and addressed the public participation requirements that had to be met, although some deemed this process inadequate, with one participant referring to it as outdated. Two participants referred to the role of the MPT and Appeals Authority, while two participants (one of whom is the same participant) mentioned forums that they are part of that facilitated knowledge dissemination and policy discussions where participants could also give inputs and voice their suggestions or critique. Only two out of three participants referred to traditional authorities (this is a characteristic of Municipality 3, and as such, the participants in the other municipalities did not need to address this). There were also three participants who addressed the relationship and expectations of ward councillors and the role they play in connecting the municipality and community. Four participants mentioned education or awareness campaigns through workshops or presentations as part of the community engagement relationship.

Six out of 11 participants levelled critique against other departments for inadequate collaboration and participation in commenting and providing inputs to guide the by-law making process of their department. In some instances, this critique was levelled at a particular department or unit and came through as blame-shifting from the participants' side. Further to this, three participants mentioned that silos still existed within municipal systems, with one participant indicating that the idea behind it was unhindered decision-making and removing interdependence on other departments that held up progress and development, but that it had the opposite

effect. It seems in most cases that participants did not want to overstep on the powers or functions of another department or step on someone else's toes.

5.6 Concluding remarks

5.6.1 Critical findings on the state of SPLUM by-laws in Emfuleni, Msunduzi and Polokwane

It is ascertained that the training of municipal officials, especially in relation to spatial planning and land use management by-law drafting, is inadequate. Furthermore, some of the key concerns of participants relating to their legislative authority and getting by-laws developed, approved and adopted, related to timeous and effective internal processes, budget allocation and skills deficits on the side of the councillors in office, which is likely an indicator of deeper systemic issues like political interference, corruption, maladministration, inadequate performance management systems, and undue delays when considerations are placed before the committees, as critiqued by one of the participants. Additionally, corruption and other challenges stifle and impede the implementation of by-laws. By-laws cannot be considered a solitary solution in attempting to address the effects of climate change and urban climate resilience, and should be considered holistically in relation to other planning instruments. Many participants emphasised the importance of the enforcement and implementation of by-laws, as by-laws are considered mere pieces of paper without these elements to ensure compliance. One pertinent example of how by-laws could be used for the purpose of this study is by adding design requirements into by-laws and implementing these on new developments. It comes through in the responses that the potential of using existing by-laws to provide for aspects of climate change and urban climate resilience is still not fully developed. Many participants were in favour of having a separate by-law dealing particularly with these issues, with just over half having stated that they would not mind amendments to the existing by-laws, mentioning aspects of capacity in environmental departments. Since the enactment of the Climate Change Act, it would be interesting to hear whether the outcome of this enquiry would be different, as it is likely that municipalities would opt for a separate by-law, where capacity

allows it. There was also a brief mention of standard draft by-laws or "specimens" that were provided to municipalities from the Department of Rural Development, which they could then amend and alter to suit their particular needs. These types of drafts have immense potential to assist municipalities with low capacity to provide adequate by-laws and could assist municipalities in navigating the complexities not only from a legal perspective but also in terms of climate-related aspects that need to be addressed. There seems to be sentiments that by-laws are merely procedural in nature and that they cannot provide for the intricacies of climate change or urban climate resilience, and that these concepts are better suited to policy documents.

5.6.2 Other relevant findings

Insofar as the duty of municipalities is concerned, the responses, while affirming that municipalities have a duty to respond to the effects of climate change and urban climate resilience, also varied significantly between the different participants. The key take-aways from their varied perspectives was, firstly, 1.a) that there is a lack of proper function management in the different line departments, b) there is a need for effective use of the range of tools and instruments that municipalities are mandated to use, including by-laws, and c) there is a need for better compliance, implementation, and enforcement of these instruments. Secondly, there is an apparent need for 2.a) sector specific local-level legislation that clearly set out the requirements for compliance in terms of the duty discussed, and can be duly enforced, b) clear and comprehensive instructions, inputs or comments to guide and departments on specific information to include in instruments that other departments are expected to draft and adopt, and c) improved cooperation and collaboration in line departments instead of trying to function in silos. Thirdly, there is a concern in respect of capacity challenges, particularly relating to financial or budgetary allocations that would capacitate the municipal officials of different departments to fulfil their duties in general, and specifically in respect of responses to climate change and climate resilience.

In relation to the use and effectiveness of LEG instruments, the data points to a preference for command-and-control instruments, especially in respect of the use

of by-laws and the importance of enforcement. The responses also indicate that while preferred, there are a lot of flaws with these instruments and particularly the implementation and enforcement thereof. Some of the prominent flaws inherent in these instruments, and the system in which they are expected to operate, relate to human and financial resource constraints, a skills and knowledge deficit, departmental silos, and a lack of integration and cooperation. Civil-based instruments follow closely behind the command-and-control instruments, especially insofar as it relates to education and awareness and to some extent stakeholder or community engagement, as capacity building is prevalent in these responses.

Further to the above, it is found that other planning instruments such as the SDF and IDP are just as useful to climate change response and urban climate resilience and should not be forgotten, even if they do not have legal effect, they are still required by law. Also, while SPLUMA principles are important, they too cannot be considered in isolation, and it is incumbent on the municipalities to ensure that they consider all factors affecting development or space.

Another interesting observation regarding the municipal structures is that there seemed to be a great awareness of political interference and other indicators of bad governance practices and systemic issues in local government. There are also indications of a disjuncture between different departments, councillors and management of municipalities, and responsibilities in terms of cooperative government and intergovernmental and -departmental collaboration.

CHAPTER 6 CONCLUSION

6.1 Research question, objectives and scope of the study

This thesis was premised on the understanding that climate change is a global issue with far-reaching implications, especially in developing countries.[1816] Despite having to deal with the effects of climate change, developing countries (South Africa among them) have other persisting challenges, such as widespread systemic poverty, large-scale informality, rampant unemployment, spatial inequality, unabated and often unsustainable urban development, corruption, and constrained service delivery capacity.[1817] Climate change exacerbates these socio-economic and governance challenges by impacting the environment and urban spaces in which these challenges persist.[1818] These impacts occur in the form of unpredictable weather variability, leading to increased rainfall and extreme heat waves, for example. Such impacts also result in disasters such as droughts and floods threatening resilience and increasing vulnerabilities and risks of communities and urban spaces to recover from, respond to, and adapt to such impacts, as they have knock-on effects on urban infrastructure, service delivery, access to water and energy, and ultimately also livelihoods.[1819] Herein lies the need for urban climate resilience and adequate legal responses, as this study sought to explain.

Urban areas are complex SES systems consisting of multiple interrelated sectors in the economic, social, environmental and governance spheres.[1820] Resilience touches on the vulnerabilities and risks associated with such systems. It is within resilience

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[1816] Intergovernmental Panel on Climate Change (IPCC*) Summary for Policymakers Climate Change 2021: The Physical Science Basis- Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (AR6) 5-14; UN 2022 https://www.un.org/en/climatechange/what-is-climate-change; Hornsey and Fielding 2019 *Social Issues and Policy Review* 3-4. See also paras 1.1 and 2.2.2 above.

[1817] See paras 1.1 and 2.2.4 above. See also UN-Habitat *World Cities Report 2022* xvi; Hodson and Ma rvin "Securitization of Urban Environments" 91; UN *World Urbanization Prospects: The 2018 Revision* 1; Allam, Jones and Thondoo *Cities and Climate Change* 12-13.

[1818] See para 1.1 above.

[1819] See paras 2.2.3 and 2.2.4 above. See also The Rockefeller Foundation and Arup *City Resilience Framework* 3; Spires *et al Building Resilience in African Cities: A Think Piece* 6; Otto-Zimmerman "Building the Global Adaptation Community" 4.

[1820] See paras 1.2 and 2.2.4.1 above.

and their application to urban areas and their continued battle against the effects of climate change that urban climate resilience emerges as a possible solution to strengthen cities and their ability to "anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner."[1821] For this reason, this study specifically set out to determine how SPLUM by-laws can enhance urban climate resilience in South African secondary cities.[1822] As such, the research question and objectives concerned the conceptualisation of urban climate resilience,[1823] determining the role of law,[1824] the legislative authority and the role of local governments[1825] and, ultimately, SPLUM by-laws in enhancing urban climate resilience.[1826] The study was, therefore, underpinned by the following ancillary objectives:[1827]

- To conceptualise urban climate resilience with specific reference to South African cities;
- To determine how the law may contribute to the enhancement of urban climate resilience with specific reference to the South African urban context;
- To critically analyse the relevant law-making responsibility and authority of local government in South Africa;
- To determine the extent to which local SPLUM by-laws in the South African context can enhance urban climate resilience;
- To assess the state of the SPLUM by-laws of three of South Africa's secondary cities, namely Emfuleni, Msunduzi, and Polokwane; and

[1821] See paras 1.2 and 2.2 above.
[1822] See paras 1.5 and 1.7 above.
[1823] See generally para 2 above.
[1824] See para 3.2 above.
[1825] See para 3.4 above.
[1826] See paras 4.2.4, 4.3, 4.4, and 4.5 above.
[1827] See para 1.7 above.

- To conclude the study and propose recommendations for the promotion of urban climate resilience through the use of by-laws and to reflect on the research that remains to be done.

Given the complexity of urban climate resilience and the comprehensive legal framework that can be applied to enhance this notion in South African cities, it was necessary to scope the study in various ways.

To contextualise urban climate resilience in a meaningful way for the South African context, the study considered several, though not all, typologies proposed for urban climate resilience in the resilience discourse.[1828] It went further in proposing a singular typology to be used throughout the study,[1829] and determines so-called actionable features for urban climate resilience,[1830] suitable for the South African context with its plethora of challenges. The actionable features are limited to six actionable features that encompass a wider range of identified features situated in four distinct spheres and contexts.[1831] The potential role of the law is vast, and resultantly, the study limited the discussion to an understanding of the law as a mechanism for promoting urban climate resilience and the role and authority of local government legislation to this end.[1832] The study was also scoped to focus on the municipal planning framework and the authority of local government[1833] and, predominantly, SPLUM by-laws,[1834] and their role in enhancing urban climate resilience.[1835] The study was further confined to a focus on secondary cities, although many of the discoveries and recommendations may apply equally well to larger or smaller municipalities.[1836]

To determine the extent to which municipalities' SPLUM by-laws could enhance urban climate resilience and the *status quo* of such by-laws in secondary cities, the

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[1828] See para 2.2.4.3 above.
[1829] See para 2.3 above.
[1830] See para 2.5 above.
[1831] See paras 2.3 and 2.4 above.
[1832] See paras 3.2 and 3.4 above.
[1833] See paras 4.2.2 and 4.2.3 above.
[1834] See para 4.2.4 above.
[1835] See paras 4.3 to 4.5 above.
[1836] See para 1.6 above.

inquiry was limited to three secondary cities, namely Emfuleni Local Municipality, Msunduzi Local Municipality, and Polokwane Local Municipality.[1837] The interviewees approached were limited to those in the legal, planning, land use, and environmental management departments, as these were the most likely candidates to meaningfully engage regarding the focus of the study and the objective at hand.[1838] Given the predominant focus of the study on the role that SPLUM by-laws can play *vis-à-vis* urban climate resilience, the questions posed to participants during the interview process related mostly to SPLUMA, the drafting and adoption, as well as the scope of SPLUM by-laws.[1839]

The semi-structured interviews were conducted during the write-up of Chapter two and before the write-up of Chapters three to five. During the formulation and writing of these chapters, it was discovered that the questions pertaining to the participants' understanding of urban climate resilience and how it could be factored into SPLUM by-laws could have been asked differently. Nevertheless, to address this gap, the researcher provided a brief background of the study and explained the concept to participants before commencing with the questions. The researcher also asked participants regarding the discretionary powers of municipalities during the drafting process and linked them back to urban climate resilience.[1840] The researcher asked whether they thought there was a place in the SPLUM by-laws for aspects of urban climate resilience,[1841] which yielded answers in line with the focus of the inquiry. Moreover, after having written the remainder of the chapters following the interviews, it is projected that a focus on coastal studies may have yielded different results.[1842]

[1837] See paras 1.8 and 5.3 above.
[1838] See paras 1.8 and 5.1 above.
[1839] See paras 5.4.5 to 5.4.8 and 5.5.5 to 5.5.8 above. See also Annexure A.
[1840] See paras 5.5.5 and 5.5.8.2 above.
[1841] See Annexure A.
[1842] See paras 1.8 and 5.3 above.

6.2 Structure of the study and research methods

The structure and research methods used in this study were informed by the research question and objectives. Consequently, Chapter two aimed, as a start, to define and conceptualise urban climate resilience. Chapter two further assessed the definitions and typologies underpinning the notion of urban climate resilience to establish, based on existing theories and typologies, a categorical understanding and description of urban climate resilience that, in turn, provided insight into actionable features suitable for the South African city context. These actionable features were employed in Chapters three and four as measures to determine the extent to which the legal framework and local-level legislation, and eventually SPLUM by-laws in the South African context, could enhance urban climate resilience. As such, Chapter two comprised a literature review of disciplines such as ecology, climate science, resilience, planning, and urban studies.[1843]

Chapter three explored how the law may contribute to enhancing urban climate resilience in general terms and critically analysed the relevant legislative responsibilities and authority of local government in South Africa. This chapter traversed the function and role of law as multi-disciplinary direct action consisting of a sound law and policy framework, that is a functional necessity of society with vast influences on urban planning, land use planning, the environment, infrastructure development, and, ultimately, urban climate resilience as it can regulate and facilitate measures to increase resilience. Chapter three also charted the legislative powers of local governments and their role and regulatory function in enhancing urban climate resilience. This chapter was general in nature, which allowed for consideration of the features of urban climate resilience within the broader framework of law and legislation. The legal framework was analysed in line with the categorical understanding and description of urban climate resilience and the actionable features distilled in Chapter two. This was then juxtaposed against local-level or municipal legislation. Chapter three was also concluded through a literature review on the South African legal framework, which required consideration

[1843] See also para 1.8 above.

of primary sources (legislation and policy) and secondary sources (case law and legal scholarship pertaining to the legislative responsibility and authority of local government) of law delineating the role and function of law and legislation (local-level legislation, particularly) in South Africa.

Chapter four set out to determine the extent to which SPLUM by-laws in the South African context could enhance urban climate resilience. For this purpose, the researcher employed a literature review consisting of planning legislation and policy (as primary resources) and case law and legal scholarship pertaining to planning law, spatial planning and land use management, and municipal planning (as secondary sources) and their potential for enhancing urban climate resilience. Based on the literature review, the researcher was able to expand on the definition of planning law suitable for the context of this study and explored the regulatory, institutional, and guiding role of SPLUM by-laws. The researcher did this to determine the legally required and prescribed content of SPLUM by-laws and to explore the space for innovative measures and incorporation of urban climate resilience.

Chapter five set out to determine the state of the SPLUM by-laws of three South African secondary cities, namely Emfuleni, Msunduzi, and Polokwane. The first part of this chapter comprised a literature review of primary sources (the planning law and policy instruments of the selected municipalities) and secondary sources (scholarly work and research reports on the local profiles of the municipalities and their law and policy instruments). The second part of the chapter was concluded through semi-structured interviews conducted with administrative staff in these municipalities. The interviews were transcribed, and the questions were converted into some critical findings.

6.3 Central findings

6.3.1 The definition of urban climate resilience and its features remains ambiguous

Despite attempts by several scholars to succinctly define and conceptualise urban climate resilience and identify the elements or features thereof,[1844] precise conceptualisations of the notion remain elusive.[1845] Where such definitions or conceptualisations exist, they are often derived from the notion of resilience, which itself can be ambiguous as it is used in different contexts beyond climate change, disaster risk management and SES studies, such as *inter alia*, engineering, psychology, and economics.[1846] Much like its proposed meaning, it is adaptable to different circumstances. When combined with the complexities inherent in urban ecosystems and climate change, it becomes even more ambiguous. The researcher attempted to address this gap by building on the definitions of resilience and climate resilience and suggesting the following definition of urban climate resilience:

> urban climate resilience, therefore, refers to the ability of an urban system (city) and its component parts to withstand, absorb, adapt to, self-organise, resist, accommodate, recover from, resile from, "bounce back", and "bounce forward" from climate specific and related shocks and stresses.[1847]

Beyond the definition of urban climate resilience, there are many suggested typologies to discern what this notion entails, with many scholars suggesting characteristics, dimensions, qualities, indicators, elements, pillars, approaches and other iterations of these words.[1848] Through comparison of the plethora of typologies, one can identify generalised characteristics and features of urban climate resilience and the agents, systems, and institutions that are interconnected therewith.[1849] The researcher used these typologies and their many overlaps and provided a categorical understanding of urban climate resilience and an illustration

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[1844] See paras 1.2.1 and 2.2 above.
[1845] See paras 1.2.1, 2.2.1 and 2.2.2 above.
[1846] See paras 2.2.1 above.
[1847] See para 2.2.4.2 above.
[1848] See paras 2.2.4.2 and 2.2.4.3 above.
[1849] See para 2.3 above.

in the form of an adapted spheres model.[1850] The result is an easy-to-follow categorically packaged typology that helps identify aspects of urban climate resilience under the different spheres of economy, social, environment, and governance.[1851] This categorical understanding described urban climate resilience in the South African context[1852] and ultimately provided six actionable features for urban climate resilience.[1853] These actionable features range from LED and sustainable livelihoods, adequate basic services, and inclusive community structures and processes to nature-based urban planning, suitable built environments, and coordinated government.[1854] These actionable features are intended to represent the basic building blocks of what is needed (what ought to be) for urban climate resilience and are action-based and achievable outcomes that city authorities in South Africa can work towards. These features are proposed in the South African city context with its unique challenges and might not be transferable to other city contexts.[1855] Just like the model used suggests, the spheres from which these features derive are interconnected and interdependent, and consequently impact each other.[1856] This means that actions toward enhancing urban climate resilience in one feature might impact another feature, whether positively or negatively.

6.3.2 Mainstreaming the features can inform policymakers and urban planners in their resilience-building efforts

There is also arguably a need for improving knowledge on urban climate resilience and how it could be mainstreamed and incorporated into policy documents, but also local-level legislation.[1857] This is evidenced by participant responses indicating that the spatial planning and land use management by-law could not provide for the intricacies and inherent complexities of notions such as urban climate resilience and

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1850 See para 2.3 above.
1851 See paras 2.3 and 2.4 above.
1852 See para 2.4 above.
1853 See para 2.5 above.
1854 See para 2.5 above.
1855 See para 2.5 above.
1856 See paras 2.3 to 2.5 above.
1857 See para 5.5.2 above.

that such notions would be better suited to other policy documents or sector-specific local legislation.[1858]

6.3.3 The South African legal framework enables the enhancement of urban climate resilience

The law is an indispensable necessity in society as it facilitates, organises and regulates relationships, interactions and actions of constituents in the applicable jurisdiction.[1859] The law is regarded as direct action consisting of a framework that establishes legally enforceable rules, principles, values, rights, and duties.[1860] The role of law in relation to urban climate resilience is to regulate the different sectors and areas impacting urban areas susceptible to climate and other socio-economic or environmental impacts, to enable or mandate activities that contribute to urban climate resilience.[1861] The law is, therefore, a mechanism for promoting urban climate resilience. The relevant legislative framework also allows for different governance instruments, among which are command-and-control instruments such as legislation.[1862] Legislation, as one source of law, is argued to possess the necessary flexibility and adaptability, at a small scale, as it allows for a certain amount of discretion and interpretation in decision-making.[1863] As such, legislation is a suitable instrument to enhance urban climate resilience, provided it remains fit for purpose, realistic, clear and concise.[1864] The multi-disciplinary and multi-sectoral nature of the law allows for a particular focus on aspects of the environment, such as climate change, air pollution, biodiversity, protected areas, coastal management, waste, water, and sanitation, for example.[1865] These sectors are taken up in the NEMA and so-called SEMAs and require cooperative governance and collaboration to ensure the effective realisation of these laws and the duties related thereto.[1866] It

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1858 See paras 5.4.2 and 5.5.2 above.
1859 See para 3.1 above.
1860 See paras 3.1 and 3.2 above.
1861 See para 3.2.1 above.
1862 See para 3.2.2 above.
1863 See para 3.2.1 above.
1864 See para 3.2.2 above.
1865 See para 3.2 above.
1866 See para 3.2.2 above.

is evident that the legal framework consists of a range of legislation and other instruments that can regulate aspects related to urban climate resilience. The legal framework evidently provides, in some shape or form, the identified actionable features of urban climate resilience.[1867]

6.3.4 The precise scope of the legislative authority and responsibility of local government remains unclear

While the Constitution and legal framework provide a wide range of powers and functions for local government, setting out its executive authority and ascribing certain objectives, duties, and responsibilities to municipalities,[1868] its legislative mandate is less clear and has been contested and debated in case law and legal scholarship.[1869] The constitutional powers and functions of local government are codified, not only in the Constitution and its Schedules, but also a number of key pieces of legislation such as the MSA, SPLUMA, and several of the SEMAs, for example.[1870] In these, there is also provision for the legislative role of municipalities, allowing them to make by-laws for matters they are mandated to administer and matters related or incidental thereto.[1871] This is not a definitive scope at all and arguably leaves a lot of room for argument as to where this mandate ends before it starts overstepping the mandates of the other spheres of government.[1872] This has become a topic of debate and received considerable judicial attention, especially as far as municipal planning and environmental competencies, for example, are concerned.[1873] However, the legislative competence of local authorities in relation to municipal planning and environment-related issues (and related or incidental matters to the mandates of local government in terms of the Constitution and Schedules 4B and 5B) has been confirmed in court, which means that there is great potential for success, should local governments ever have to defend its legislative

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[1867] See para 3.3 above.
[1868] See para 3.4 above.
[1869] See para 4.2.2 above.
[1870] See para 3.4 above.
[1871] See para 3.4 above.
[1872] See paras 4.2.2 and 4.5 above.
[1873] See para 4.2.2 above.

competence to include aspects or urban climate resilience in its by-laws.[1874] Municipalities, therefore, (arguably) have legislative discretion to include urban climate resilience in their by-laws, such as their SPLUM by-laws.[1875] In the absence of more restrictive and descriptive national and provincial legislation or regulations, this (arguably) results in a *lacuna* in which municipalities can be considered to have legislative discretion, provided, of course, that their legislation be in line with the Constitution and national and provincial legislation. It may also not amount to usurpation of the mandates and competencies of the other spheres and must include any legally prescribed and locally relevant content.[1876]

6.3.5 The planning law definition is inadequate for climate resilience

While the discourse on planning law provides several definitions and conceptualisations of what planning law entails, the definitions were not suited to the context of this study.[1877] The reason is that it did not adequately provide for the development principles contained in SPLUMA, nor did it consider the different spheres (economic, social, environmental, or governance), or the features of urban climate resilience as it neglected also to consider the changing dynamics of urban spaces and the unpredictability inherent in climate change and disaster risk.[1878] As such, this thesis has attempted to address these perceived shortcomings by proposing a more holistic definition of planning law. The proposed definition of planning law reads that it is:

> an area of law that provides a sustainable framework for land use development and management planning, that ensures the health and wellbeing of society as a whole; takes into account overarching interests of and developments in LED and sustainable livelihoods, adequate basic services, inclusive community structures and processes, nature-based urban development, suitable built environments along with coordinated governance in relation to spatial planning and land use management; is based on the development principles of spatial sustainability, spatial justice, spatial resilience, efficiency, and good administration; is cognisant of unplanned development, changing circumstances, municipal capacity, and

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1874 See paras 3.4 and 4.2.2 above.
1875 See para 4.5 above.
1876 See para 4.5 above.
1877 See para 4.2.2 above.
1878 See para 4.2.2 above.

climate change; and enables suitable mitigation and adaptation and disaster management responses and preventative measures.[1879]

This expanded definition is extended to include all of the missing elements[1880] and is more accommodating in allowing for aspects of urban climate resilience.

Furthermore, planning law has evolved from a very exclusionary and discriminatory approach to land use management to a more inclusive and integrated planning law framework under SPLUMA.[1881] The advent of SPLUMA was long overdue, as the previous planning system was problematic and led to a parallel system, which was ineffective and was argued to lead to usurpation of local government's competence to deal with municipal planning as part of its constitutionally mandated powers and functions.[1882] However, the SPLUMA is not without its flaws as it still does not adequately align with the division of powers as demarcated in the Constitution, and this will inevitably perpetuate the uncertainty on the legislative authority of local government.

6.3.6 By-laws remain undervalued and underutilised instruments

Despite the Constitution and legal framework mandating the drafting of local government legislation for matters they have the right to administer, as well as related and incidental matters, by-laws are not used to their full potential.[1883] This became evident during the semi-structured interviews with the local municipalities and in the literature review regarding the role of by-laws in enhancing urban climate resilience. The literature review exposed a very scant literature base on by-laws and their potential role and effectiveness, with most of the existing literature providing general overviews of what by-laws are, how they should be adopted, and very limited information on what should be contained therein, with the exception of

[1879] See para 4.2.2 above.
[1880] See para 4.2 above.
[1881] See para 4.2.1 above.
[1882] See para 4.2.2 above.
[1883] See paras 3.4, 4.5, 5.4.4 and 5.6.1 above.

maybe one article by De Visser and Poswa, in which they investigated the by-laws of fifteen municipalities' planning by-laws.[1884]

Moreover, the semi-structured interviews uncovered that the municipalities did not have environmental management by-laws, for example,[1885] and the spatial planning by-laws were considered mere procedural documents.[1886] The former was blamed on inadequate budgetary allocation, ill advice from legal departments, the costs of developing by-laws and capacity restrictions.[1887] The latter was ascribed to the perceived necessary provisions determined by law relating to procedures in respect of the composition of the MPT and appeals authority, the prescribed processes for applications and decision-making. To address this *lacuna*, the study proposes that the role of spatial planning by-laws is three-pronged and consists of a regulatory, institutional, and guiding role.[1888] From this, it is posited that by-laws are useful command-and-control instruments and go beyond mere procedural provisions, and based on their regulatory role, it is intended to give effect to the IDP, SDF, and LUS.[1889] Its institutional role is where it prescribes procedural elements and things like timeframes, which are aimed at procedural fairness, transparency and accountability.[1890] The guiding role also takes the by-laws beyond merely procedural in nature and can guide local government in balancing development needs with environmental and socio-economic considerations.[1891] As the discretion of local government is not qualified and the prescripts only include that, at a minimum, by-laws must be consistent with the Constitution, uphold and realise the fundamental rights in the Bill of Rights, and not be contrary to national or provincial legislation, there is considerable room for innovation, experimentalism and municipal discretion.[1892] Consequently, it is deduced that there is room for innovation for local

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1884 See paras 3.4 and 4.3-4.4 above.
1885 See paras 5.4.2 and 5.5.2 above.
1886 See para 5.5.6 above.
1887 See para 5.5.2 above. See also 6.3.7 below.
1888 See paras 4.3 to 4.5 above.
1889 See para 4.3 above.
1890 See para 4.4 above.
1891 See para 4.5 above.
1892 See paras 4.2.4 and 4.5 above.

government to use their legislative competence in terms of municipal planning and the enhancement of urban climate resilience.

6.3.7 Municipal officials are insufficiently trained in terms of by-law drafting

An analysis of the responses of participants revealed that while participants have tertiary qualifications and partake in continuous self-improvement or development through postgraduate education, certifications, diplomas, short courses and participation in other professional forums, there is a lack of training opportunities offered and facilitated by municipalities or local government associations (such as SALGA).[1893] The participants' qualifications were deemed requisite to them getting their jobs. In other words, they are deemed suitably qualified for the positions they hold. However, the participants did not consider this to be sufficient, especially insofar as some of their functions and duties require them to draft local legislation in their specialised field (e.g. planners), for example, without the specific know-how or training on how to draft legislation.[1894] The analysis also showed that there is a need for training on the contents to be included in the SPLUM by-laws and on issues such as climate change and the nature and scope of urban climate resilience, and how these concepts could be mainstreamed into municipal planning.[1895] Though it was mentioned that there were draft examples or "specimens" available to guide municipalities in developing their SPLUM by-laws, these are not easy to come by and it is not clear to what extent it assisted the participants in drafting, and many of the responses alluded thereto that these documents were not considered sufficient by participants as many indicated that the by-laws were mainly drafted and reviewed by themselves, with limited input from other departments.[1896] This indicates that the draft/standard/blueprint by-laws were not enough to provide clarity on the development of the SPLUM by-laws and, as such, did not constitute "training" in the sense that it did not adequately guide municipalities in the development of such by-laws, which is, after all, its main function.

[1893] See paras 5.4.1 and 5.5.1 above.
[1894] See paras 5.4.1 and 5.5.1 above.
[1895] See broadly para 5.6.1 above.
[1896] See paras 5.4.5-5.4.8 and 5.5.5-5.5.8 above.

6.3.8 Local municipalities do not have the requisite human, skills and fiscal capacity to develop and pass new by-laws

It is no secret that local government, especially local municipalities, are often under-resourced in terms of human and fiscal capacities. This is evident in the service delivery challenges that municipalities across the country face and in the number of municipalities under administration.[1897] The analysis of the interviews revealed that there is, firstly, a human-resource deficit, and certain departments only have two or three staff members of the same skill set or in the same field, such as planners in the planning department who are required to fulfil the mandate of local government.[1898] This translates into unrealistic responsibilities and expectations in realising the municipal powers and functions. Related thereto, there is also limited interaction between different line departments, meaning that while the municipality might have different skill sets and backgrounds, they are not connected and do not engage sufficiently, leading to a siloed functioning of local government.[1899] This leads to outsourcing and paying for skills outside of the municipality, which makes the drafting process even more expensive than it would likely have been if in-house resources were used.[1900]

Further to this, the interviews with participants in the environmental management line departments revealed that there is no political buy-in for environmental concerns and as such the environmental management departments are not provided with adequate budget allocations to perform their powers and duties.[1901] The interviews also showed that the development of a new by-law specifically geared towards environmental and/or climate change aspects was preferred rather than having to amend existing by-laws,[1902] yet it was mentioned throughout the interviews that development of by-laws are expensive, meaning that underfunded environmental departments for example have no way to give legal effect to and

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[1897] See para 2.4.3 above.
[1898] See paras 5.4.1, 5.5.1 and 5.5.2 above.
[1899] See paras 5.4.2 and 5.5.2, 5.4.4 and 5.6.2 above.
[1900] See para 5.5.7 above.
[1901] See paras 5.4.2 and 5.5.2 above.
[1902] See paras 5.4.2 and 5.5.2 above.

perform their functions and powers.[1903] Development of a new by-law specifically dealing with such issues may, therefore, be unattainable for many local municipalities.

The fiscal constraints in municipalities result not only in under-funded departments but also have knock-on effects on the implementation of instruments such as by-laws.[1904] Without the implementation and enforcement of the by-laws, the by-law is effectively meaningless, and the municipality would in such circumstances have wasted money as the by-law would be reduced to a mere procedural document, as alluded to above.[1905] The interviews also emphasised that the fiscal capacity of municipalities is worsened by corruption, maladministration, and lengthy processes that cause undue delays and even higher costs incurred.[1906]

6.3.9 Inadequate implementation of municipal by-laws

Though many of the responses indicated that implementation is an important part of command-and-control instruments, implementation is generally deemed ineffective. The interviews underscored the challenges with the implementation and enforcement of municipal by-laws, especially relating back to the resource constraints mentioned above.[1907] The lack of implementation was considered to be associated with a lack of funding to implement instruments,[1908] a lack of necessary human resources to implement these instruments, and uncertainty as to who was responsible for the implementation and enforcement thereof.[1909] The responses also revealed that while by-laws as command-and-control instruments were preferred they were flawed, making them unimplementable and ineffective as they need to operate in an inherently flawed system that does not have adequate funding mechanisms, inadequate human resources to realise the implementation, a skills and knowledge deficit, persisting departmental silos, and a lack of integration and

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1903 See para 5.5.2 above.
1904 See paras 5.4.4 and 5.5.4 above.
1905 See paras 5.5.2, 5.5.5 and 5.5.6 above.
1906 See para 6.3.9 below.
1907 See para 6.3.7 above.
1908 See para 5.4.5 above.
1909 See paras 5.4.9 and 5.5.5 and 5.6.1 above.

adequate collaboration.[1910] In the same vein, it also became apparent that participants considered the systems and processes inadequate and not fit for purpose, in that some of the traditional methods of doing things were outdated and "out of touch with the real world" or that flaws in the by-laws could in some instances only be identified during the implementation stage, which meant that these flaws then had to be amended.[1911]

6.3.10 Deeper systemic issues cause undue delay when adopting and enacting municipal by-laws

It was observed that the adoption and enactment of by-laws were particularly challenging and subject to undue delays.[1912] These challenges often occurred after the development stage of drafting municipal by-laws, either at the adoption or implementation stages. This was ascribed to issues such as political interference, the time-consuming nature of getting by-laws adopted by three different committees (each requesting some form of training with no definitive direction in terms of the organisation of such training), only to be bolstered by change in management and political office-bearers being replaced, meaning that the process had to start anew and might even be scrapped based on the political agendas off councillors in office.[1913]

6.3.11 SPLUM by-laws are not the solitary solution to address urban climate resilience

The literature review in Chapter four and the analysis of the interview responses in Chapter five revealed that by-laws, while useful command-and-control instruments,[1914] are not a solitary solution or instrument but should be considered holistically in relation to other instruments and should be used as complementary to such instruments.[1915] Another aspect that was uncovered is that there is a need

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[1910] See para 5.4.3 above
[1911] See paras 5.4.7 and 5.4.9 above.
[1912] See paras 5.4.3, 5.4.4, 5.4.9, 5.5.9, and 5.6.1 above.
[1913] See paras 5.4.3, 5.4.4 and 5.4.5
[1914] See paras 5.5.4 and 5.5.6 above.
[1915] See para 5.6.2 above.

for the effective use of instruments such as by-laws, and as they are intended to give effect to instruments such as IDPs, SDFs, and LUSs,[1916] they also cannot operate in isolation. This does, however, mean that the role of by-laws should be considered, and based on the roles they serve, they should be used in the most effective way possible, supported and complemented by other instruments to reach its full potential. This requires sufficient integration and alignment with other by-laws and instruments of the municipalities.

Consequently, the analysis of the interviews further supports the above finding and emphasises the usefulness and effectiveness of the IDP, SDF, and LUS, as well as LEG instruments for municipal planning.[1917] A lot of emphasis was placed, particularly on the usefulness of SDFs,[1918] LUSs,[1919] incentive-based instruments,[1920] and civil-based instruments (where, particularly, educational awareness and engagement with communities enjoyed attention).[1921]

6.3.12 Inadequate cooperation, collaboration and siloed operation within municipal departments

The interviews revealed a discontent between departments regarding the amount and quality of feedback provided during the commenting or circulation, which is standard practice at municipalities.[1922] Participants revealed that while other departments mostly responded and took part in the circulation exercise, in which they were required to provide input into policy or by-law documents of other departments, they were generally disappointed with the quality of feedback received. This represents the argument that there is still, after many years of this exact issue being debated, a siloed operation in local governments between line departments.[1923] In some instances, other departments, such as the legal

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[1916] See paras 3.4 and 4.3 above.
[1917] See para 5.6.2 above.
[1918] See paras 5.4.2, 5.4.5, 5.4.6, 5.4.9, 5.5.5 and 5.5.6 above.
[1919] See paras 5.4.2, 5.4.4, and 5.4.8 above.
[1920] See paras 5.4.4, 5.4.8 and 5.5.4 above.
[1921] See paras 5.4.3, 5.4.4, 5.4.9, 5.5.3, 5.5.4 and 5.5.9 above.
[1922] See paras 5.4.2,
[1923] See paras 5.4.2

department, only act in an advisory perfunctory role, despite their potential to assist to a greater extent, such as for example drafting of by-laws. This advisory role is also juxtaposed with mere "tick-box exercises" in commenting on other departments' legal and policy documents. The circulation exercise is deemed insufficient for adequate interdepartmental cooperation and collaboration. These siloes frustrate adequate integration and streamlining of by-laws with that of other departments and affects implementation and enforcement as in the case of Municipality A, for example, the implementation is situated within the relevant line departments rather than legal services.[1924] While the idea behind the different departments was allowing functional freedom and independence and ensuring that there are no delays in terms of processing or enforcement dependent on other departments, it has had the opposite effect and has instead become an impediment to proper implementation by creating even more silos.[1925]

Another aspect that came to the fore is the further disjuncture between the management, councillors, and administrative officials. This disjuncture is evident from the critique levelled against councillors and management's undue delays in adopting by-laws, the underfunding of certain departments, and perceived political interference.[1926] The challenges of siloed operation and disjuncture between local government role players necessitate proper functioning and management in line departments, clarity on responsibilities in terms of implementation and enforcement, clear roles and responsibilities for all local government role players and improved cooperation and collaboration among and between the line departments and management and councillors, and a need for good governance practices.

Notably, one of the municipalities had measures in place where they could make further enquiries through site visits, for example, to gain an understanding of why a certain comment was made or omitted or why a certain decision was made.[1927] The value of interdepartmental cooperation and collaboration was also highlighted

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[1924] See paras 5.4.2
[1925] See para 5.4.2 above.
[1926] See para 5.4.3 above.
[1927] See para 5.4.2 above.

as an important part of the decision-making process undertaken by the MPT, for example, as it relied heavily on the inputs of officials on development applications.[1928]

6.4 Recommendations

6.4.1 Mainstream urban climate resilience and the actionable features

The study proposes that the national government mainstream urban climate resilience into its environmental, climate change, and planning law and policy framework. This could mean that legislative review is required, though not to the extent of a complete overhaul. The purpose of such review would be to address the shortcomings of the current legislation with respect to, firstly, a clearly defined role for local municipalities under the Climate Change Act; secondly, amending the SPLUMA and other relevant legislation and policies to incorporate more clearly the notion of urban climate resilience and its actionable features, with the aim of providing a framework within which local government can then align their legal and policy frameworks; thirdly develop guidelines to be used by municipalities to enable them to incorporate urban climate resilience into their own environmental, climate change and planning instruments, without having to go beyond their in-house capacity and budgetary allocations (e.g. to appoint an external consultant to assist them). This could arguably be done in the form of a policy or so-called local government toolkit to guide municipalities on their responsibilities, mandates and functions in terms of urban climate resilience and the enhancement thereof in their economic, social, environmental and governance spheres and contexts. Such a toolkit or guideline could act as complementary to legislation, and rather than reviewing legislation, which can be time-consuming, costly, and strenuous, it can provide a comprehensive overview of urban climate resilience, its actionable features (which can be framed as targets or goals), and clearly set out the role and responsibilities of local government as prescribed by the Constitution, SPLUMA, the MSA and the SEMAs, as well as any other relevant legislation. A guideline or toolkit

[1928] See para 5.4.2 above.

of this nature can raise awareness of the importance and need for urban climate resilience and foster political interest that could potentially lead to political will and buy-in, and lead to better budget allocation for municipalities to perform their duties and functions as required in terms of law. Such a toolkit or guideline can also be tailored to include examples of how municipalities can mainstream urban climate resilience into their planning instruments, LEG and climate change-related instruments. Other examples of such toolkits to guide municipalities have been developed by SALGA,[1929] and as such, it is suggested that SALGA assist in developing such a toolkit for the present purposes.

6.4.2 Sector-specific legislation to define the legislative duty of local government in relation to urban climate resilience

While some of the SEMAs and SPLUMA allow municipalities to perform their legislative functions through the adoption of by-laws, the scope of local government's legislative power is not clearly defined. The MSA prescribes the procedures but does not venture into specifics on what municipalities may or may not include. The only caveat applied in all instances seems to be that it may not conflict with national and provincial legislation and must be aligned therewith. It is only in some instances where municipalities are compelled to develop by-laws aimed at a certain provision in law, such as fees and tariffs policy by-laws, for example, that there is some format or list of contents to be included that guides municipalities on what they are required, by law, to include in their by-laws. In the absence of such guidelines or prescribed contents, the scope for municipal discretion becomes a large canvas which municipalities can explore. This is arguably where the legislative authority of local government can be used innovatively, and municipalities can experiment with their discretion to incorporate urban climate resilience into their by-laws and planning instruments. However, in the absence of guiding principles or guidelines in terms of what their duties and functions are in terms of their legislative authority, it is very likely that municipalities will not feel capacitated to develop such

[1929] See, for example, SALGA *Local Government Innovation Toolkit* (2018); SALGA *Local Government Records Management Toolkit* (2020). See also Local Government Climate Change Support Program (LGCCSP) *Lets Respond Toolkit* (2018).

by-laws even if they have the authority to (this is evident in environmental management by-laws or rather the lack thereof). As such, municipalities would benefit greatly from legislative guidance (or as mentioned above, a toolkit or guideline of some sort) clearly setting out and defining their legislative duty in terms of urban climate resilience.

6.4.3 Improved interdepartmental collaboration and cooperation to enhance capacity building

In order to move away from the siloed approach prevalent in local government, it is proposed that municipalities explore alternative ways, beyond the circulation of documents to other departments for input, in an effort to enhance interdepartmental cooperation and collaboration. This would also mean using the resources available in the municipality instead of contracting out. As such, collaborative workshops could be beneficial, where different departments are required to be involved in the drafting processes. Another suggestion would be a procedural guideline or directive on how collaboration must take place to ensure adequate collaborative measures.

6.4.4 Training and workshops on impacts of climate change and urban climate resilience and integration thereof into LEG and planning instruments

This thesis proposes that municipalities should provide more training and workshop opportunities to the officials, management and councillors in municipalities pertaining to urban climate resilience (educating them on the definition and scope thereof). Methods of mainstreaming are needed to integrate urban climate resilience into planning and other instruments (this could also be based on the toolkit or guideline mentioned above), and legal and policy drafting, especially for those in positions where they are expected to draft municipal laws and policies, and those involved in the adoption or implementation of such local-level law and policies. These workshops or training sessions could also be facilitated by SALGA. This will arguably also guide municipalities in selecting suitable and appropriate instruments and effectively using them to enhance urban climate resilience in the urban spaces within their jurisdictions.

6.4.5 National and provincial governments to develop guidelines and standard draft by-laws for amendment and adoption by municipalities

Standard or draft by-laws published by the Minister or the MEC responsible for local government and organised local government are aimed at assisting local governments to realise their legislative prerogatives, and the draft by-law processes can be initiated by municipalities. These draft or standard model by-laws are aimed at assisting especially municipalities that do not have the skills, human resources, or financial resources to develop their own by-laws. These drafts could be accompanied by guidelines on how municipalities can use them, how they can amend them and how they can go about adopting them. As a formal version of such a by-law could not be found during either the interviews or the literature review, it is proposed that such draft and standard model by-laws should be made available on provincial or national websites. These could arguably also be done in collaboration with municipalities that intend to use such draft by-laws and involve them in the entire process so that they acquire the requisite skills to amend and review the by-laws should the need arise. These draft by-laws should arguably be done in collaboration and in cooperation with local governments in need of such draft by-laws to sustain the autonomy of the local government sphere, as such, the national or provincial spheres should serve a guiding role to capacitate the relevant local government.

6.5 Future research

Throughout the course of this study, it became evident that further research is needed in this field. Future studies into these and other related legal and quasi-legal issues may be beneficial for enhancing urban climate resilience and local climate governance in the South African (secondary) city context. Some of these issues are phrased here as research questions:

a) To what extent will the newly enacted Climate Change Act affect the role of local municipalities and their legislative and executive authority and responsibilities in enhancing urban climate resilience and responding to climate change-related issues within their jurisdictions?

b) To what extent would coastal local municipalities' approach to urban climate resilience differ from those of inland municipalities in terms of legislative responses and considerations?

c) To what extent are traditional authorities involved in spatial planning and land use management decisions of municipalities?

d) How can South Africa's planning law and policy framework be adjusted to enable and encourage municipalities to use their discretion to legislate for urban climate resilience and other climate change aspects and matters related to or incidental to their municipal planning authority and responsibilities?

e) To what extent do coalition governments, political interference, and market forces impact municipal planning functions and powers and the development, adoption, and implementation of their planning instruments?

f) To what extent does insufficient budget allocation hinder municipal functions and powers, especially insofar as the environment and related issues such as climate change, air pollution, biological and ecological degradation, and sustainable development are concerned?

g) What difference would it make should political parties show a greater appetite for climate action and environmental governance?

ANNEXURE A

Concept questions for participants

1 Did you receive any formal training to perform your duties as [assistant manager for the super bylaw department]? If yes, please explain.

2 Do you think that municipalities have a duty or responsibility to respond to the effects of climate change (and urban climate resilience, as explained)? Please explain?

3 Municipalities have legislative and executive authority to contribute to the national effort to address climate change. Explain how you understand this authority and how you see it being relevant for urban climate resilience.

4 Do you think that governing tools (for example, local environmental governance tools such as command-and-control instruments (by-laws or law-enforcement), incentive-based instruments, agreement-based instruments, or civil-based instruments) can be used to address the impacts of climate change, and if so, which do you think will be most effective?

5 Do you think that SPLUM by-laws can be used to promote urban climate resilience (as explained) as far as it pertains to: [list the features of urban climate resilience as identified in Chapter two of the study]? Please explain with examples.

6 Does your municipality have a spatial planning and land use management by-law? If yes, how recent or up to date is it, and what do you understand to be contained therein?

7 Are you involved in the formulation or drafting of the spatial planning and land use management by-law? Please elaborate on your involvement (i.e., what are your responsibilities in this regard, what considerations are there in the drafting of the by-law, etc.).

8 Are you aware of the specific requirements for SPLUM by-laws in terms of the Spatial Planning and Land Use Management Act? Please elaborate.

9 Do you think municipalities have discretion in terms of what to include in their municipal by-laws? Please explain?

10 Would you recommend any amendments to the current SPLUM by-laws of your municipality, or do you think separate by-law(s) may have to be drafted and implemented for urban climate resilience (as explained at the onset of the interview)? Elaborate.

11 Please describe the working relationship between the municipal officials and councillors responsible for drafting and adopting the spatial planning and land use management by-law, and elaborate on the involvement of other stakeholders/expertise in this process.

12 Do you have any other comments or issues regarding the use of municipal by-laws as it relates to urban climate resilience?

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