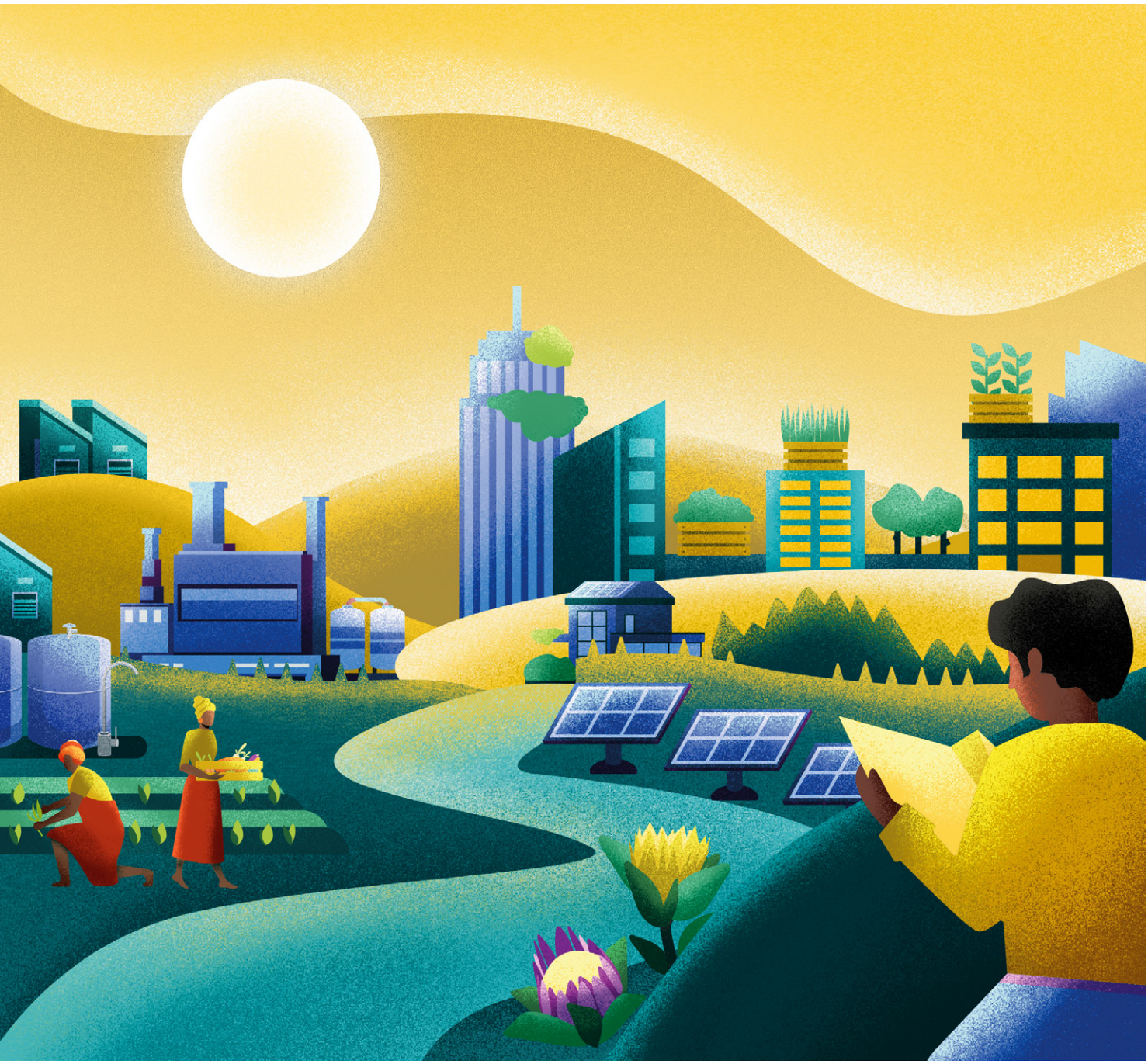
National study

September 2022

South Africa

Finance for adaptation at the level of local government in South Africa



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About this study

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Strengthen National Climate Policy Implementation:
Comparative Empirical Learning & Creating Linkage to Climate Finance

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Acronyms

A-NDC	Adaptation component of the NDC
AF	Adaptation Fund
BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
C40	Cities Climate Leadership Group
CAN	Climate Adaptation Note
CBT	climate budget tracking
COP26	26th United Nations Framework Convention on Climate Change Conference of the Parties, held in 2021
CSO	civil society organisation
DAE	Direct Access Entity
DBSA	Development Bank of Southern Africa
DEFF	Department of Environment, Forestry and Fisheries
DFFE	Department of Forestry, Fisheries and the Environment
DFI	development finance institution
DMFA	Danish Ministry of Foreign Affairs
EA	Executing Agency
EbA	ecosystem based adaptation
EDA	Enhanced Direct Access
GCF	Green Climate Fund
GDP	Gross Domestic Product
GFT	Green Finance Taxonomy
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GST	Global Stocktake
ICF	international climate finance
ICLEI	International Council for Local Environmental Initiatives
IKI	International Climate Initiative
LGCCSP	Local Government Climate Change Support Programme
LLA	Locally Led Adaptation
LVC	land value capture
MFMA	Municipal Finance Management Act
MIG	Municipal Infrastructure Grant
MISA	Municipal Infrastructure Support Agent
MTSF	National Medium-Term Strategic
NAFAB	National Adaptation Financial Advisory Board
NAP	National Adaptation Plan
NBI	National Business Initiative
NCCAS	National Climate Change Adaptation Strategy
NDC	Nationally Determined Contribution
NIE	National Implementing Entity
ODA	overseas development assistance
PFMA	Public Finance Management Act
PPP	Public-private partnership
SACN	South African Cities Network
SALGA	South African Local Government Association

SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SGF	Small Grants Facility
TAP	Transformative Actions Programme
TRMP	Transformative River Management Programme
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

Chapter one

Introduction

1. Introduction

South Africa has made a number of policy and legislative commitments to address climate change. The National Climate Change Response White Paper (NCCRP) (Republic of South Africa, 2011) outlines the national response and government's role and responsibilities, and informs the Draft National Climate Change Bill (Department of Environmental Affairs, 2018a) which will, upon enactment, be the framework legislation for the country's climate change response. South Africa's Nationally Determined Contribution (NDC) and NDC Update (Department of Environmental Affairs, 2015, Republic of South Africa, 2021a) include both climate change mitigation and adaptation commitments. The National Climate Change Adaptation Strategy[1] 2020-2030 (NCCAS) guides adaptation planning and implementation across all levels of government and informs commitments made in the NDC. The National Development Plan (National Planning Commission, 2011) is the overarching policy framework to guide development, with a focus on eliminating poverty and reducing inequality by 2010 and ensuring environmental sustainability.

Implementing South Africa's policy and legislative commitments to address climate change adaptation requires significant funding, yet the full extent of funding flows, their impacts, and the nature of the deficit in South Africa are still unknown, impeding effective adaptation in practice. This report explores the topic of financing adaptation in South Africa, focusing on how funding might be enhanced to meet country needs.

Various estimates of adaptation costs have been made for South Africa. The Low Emission Development Strategy (LEDS) estimates that it could cost South Africa more than US$300 billion to adapt to climate change for the period 2021-2030 (Republic of South Africa, 2020). In the NDC, future adaptation cost estimates from 2020-30 ranged from US$0.42-29.8 billion; and from 2020-2050 ranged from US$0.2-50 billion, depending on mitigation scenario. The NDC Update puts adaptation needs and costs for the period 2021-2030 at US$16-267 billion; these calculations are based on technical analysis by the Centre for Scientific and Industrial Research (CSIR) which developed sectoral cost functions based on historic costs to forecast future costs (Council for Scientific and Industrial Research, 2021). When adjusted by a minimum of 4% of GDP, the total adaptation needs and costs become US$122 billion by 2025 and US$375 billion by 2030 (Republic of South Africa, 2021b). The NDC Update range incorporates initial cost estimates made for implementing the nine strategic interventions of the NCCAS up to 2030, which range from US$43-82 billion at 2019 prices, taking into account the inflationary impact of acting later in the implementation period of the NCCAS (Department of Environment Forestry and Fisheries, 2019)[2]. In all these cases, the estimates are for adaptation costs over a particular time period (LEDS, NDC and NDC Update), or for particular adaptation actions over a set time period (NCCAS). These figures are thus likely to be only a sub-set of total adaptation costs.

1 The NCCAS serves as the first National Adaptation Plan.

2 The Department of Environment, Forestry and Fisheries (DEFF) changed its name to DFFE with effect from 1 April 2021; changing the sequence of words and letters. In 2019, there had been a merger of the Department of Environmental Affairs (DEA) with the forestry and fisheries components of the Department of Agriculture, Forestry and Fisheries. Up until approximately 2009, tourism had been combined with environment, then Department of Environmental Affairs and Tourism (DEAT).

Globally and in South Africa, adaptation is underfunded by international climate finance[3] in comparison to mitigation (Atteridge, 2021, Savvidou et al., 2021). A possible reason advanced for this is that the articulation of adaptation needs and costs is less specific and detailed in comparison to mitigation, and therefor fails to attract funding (Winkler, et al., 2021). In addition to the global discrepancies over allocations of adaptation finance, another issue arises in that most focus has been on mobilising finance to the national level, and much less attention has been paid to how it gets to the subnational level, where the majority of implementation takes place. Attention has increasingly been paid to this within the UNFCCC process (UNFCCC Standing Committee on Finance, 2021).

In South Africa, various efforts have been made to support adaptation, including building capacity to develop local-level vulnerability assessments and identify adaptation needs, and improve access to climate finance through the design of project proposals that are able to attract funding and reduce the gap between finance needs and funding (e.g. Reddy et al. 2021). Yet access by subnational government structures (provinces and municipalities) to international climate finance remains very limited, and very few are accessing domestic funding resources to support their adaptation priorities (ICLEI Africa, 2019a, Petrie et al., 2018). This is clearly a significant bottleneck that needs to be better understood in order to unlock appropriate finance flows to meet adaptation needs.

This study takes a mixed method approach, including desktop analysis and literature review, interviews with stakeholders working on finance for climate objectives with or in subnational government, and perspectives gathered in a municipal government webinar, to address two main research questions:

- What are the priorities, resource needs and current resource flows for adaptation in South Africa, with particular focus on the subnational level?
- What is the nature of the current gaps and barriers to access, and how can they best be overcome to unlock adaptation finance flows to subnational level?

The report is structured as follows: Section two describes the study's method. Section three reviews the literature on South Africa's finance needs and finance flows for adaptation. Section four describes parallel efforts to build capacity to access existing climate finance and to lay foundations for improved climate finance tracking. Section 5 discusses the remaining barriers and significant gaps in adaptation funding and reflects on implications for mechanisms and institutional arrangements for funding adaptation. Section 6 concludes the report and offers recommendations.

3 There is no internationally agreed definitions for climate finance. We understand international climate finance to include finance mobilised and finance support in response to obligations for developed country Parties under Article 9 of the Paris Agreement.

Chapter two

Method

2. Method

This study takes a mixed methods approach to gather information about subnational governments' adaptation needs and experiences in efforts to secure the necessary funding, and to assess outstanding gaps that need to be overcome to support more effective adaptation finance flows to the local level.

A literature review was undertaken to determine current adaptation needs and finance flows and to find published barriers and success stories at both national and subnational level. The literature review includes published and grey literature results from a search of databases in the months November and December 2021, using the search terms: "climate finance" AND adaptation AND subnational AND "South Africa" in English, published since 2016. Google Scholar yielded 1,110 results, which were filtered to include only cases specific to South Africa and adaptation, and exclude cases with adaptation as an incidental benefit only (for example, results about South Africa's Expanded Public Works Programme). The websites of national actors involved in capacity building to access climate finance were searched, including the Department of Fisheries, Forestry and the Environment (DFFE), National Treasury Department, the South African National Biodiversity Institute (SANBI), the South Africa Local Governments Association (SALGA), the South African Cities Network (SACN) and the National Business Initiative (NBI).

To complement the literature review and further explore subnational adaptation needs, priorities, and experiences with adaptation finance, bilateral semi-structured interviews were conducted, identified from the literature review and snowball sampling. Interviewees included local government representatives. However, since so few municipalities have successfully accessed climate finance directly, this proportion of the sample proved to be very small. Instead, the sample was expanded to include other stakeholders who are concerned with this, including staff in the DFFE, SANBI, SALGA, and ICLEI Africa, and with consultants working with the DFFE, National Treasury Department and SACN to build capacity in local government to access or track climate finance (listed in Table 1). The interviews focused on adaptation priorities and needs identified in adaptation finance-related capacity building processes, examples of adaptation project ideas conceived and designed at the subnational level, and the extent to which finance for adaptation is being effectively accessed and used by municipal and provincial governments.

Additional insights were sought from a webinar event, co-hosted with SALGA, with guest panel speakers from DFFE, the Municipal Infrastructure Support Agent (MISA) and ICLEI Africa. This webinar focused on the delivery of climate-proofed infrastructure and was attended by an extensive range of municipal representatives – hence enabling the gathering of a wider range of perspectives than were available from interviews.

Table 1 Stakeholders interviewed

Interview number	Date	Stakeholder role	Focus of the interview
Interview 1	22 October 2021	Local government association representative	Experiences and strategies of local governments for financing climate change adaptation
Interview 2	12 November 2021	Non-government professional in the climate finance field	Design and implementation of the climate budget tagging pilot project piloted on behalf of national government
Interview 3	28 October 2021	Non-government professional in the climate finance field	Insights from the climate finance training programme for local governments
Interview 4	18 November 2021	NGO representative	Support for municipalities to access climate finance and project concept outcomes
Interview 5	24 November 2021	Local government representative	A district municipality's experiences in implementing multilateral climate finance
Interview 6	2 December 2021	Non-government professional in the climate finance field	Climate finance technical advice and innovative climate finance mechanisms
Interview 7	11 January 2022	GCF Accredited Entity representative	Development of the pipeline of proposals to the Green Climate Fund
Interview 8	15 February 2022	Local government association representative	Experiences and strategies of local governments for financing climate change adaptation
Interview 9	25 March 2022	National government representative	Progress in building local government capacity to access climate finance for adaptation
Interview 10	12 May 2022	Local government representative	The origin and process for planning climate action and related finance for a metropolitan municipality
Interview 11	16 August 2022	Local government representative	Experiences in implementing bilateral finance support for adaptation in a district municipality

Chapter three

Climate finance availability and access

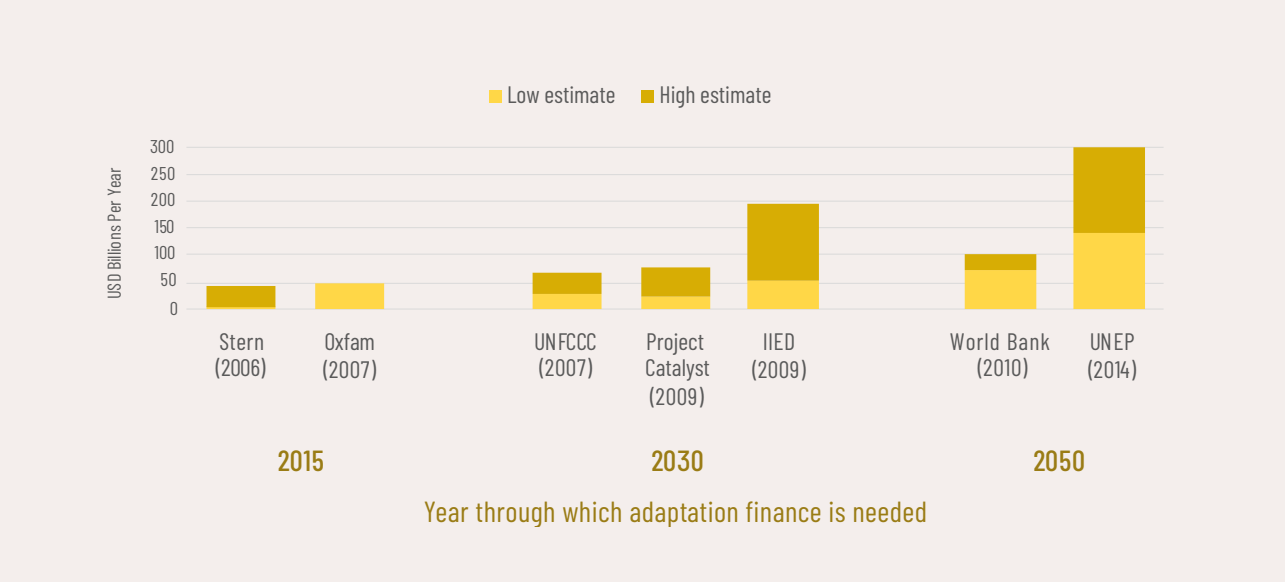
3. Climate finance availability and access

3.1 Global climate finance

Projecting the costs of adaptation into the future, and thus the magnitude of adaptation finance needs, is a difficult task, and subject to varying methods. One approach is to look at the cost of climate change impacts based on scenarios. However, this is subject to the same challenges as projecting future climate itself because of multiple and cascading dimensions of uncertainty (Fankhauser, 2009). The extent of inclusion of sectors also varies, with ecosystems, energy, manufacturing, retailing and tourism often excluded (Parry et al., 2009). Another approach is to determine the additional costs of development due to climate change (which is the model adopted by most of the climate finance mechanisms) – but this requires that the development deficit is addressed, without which funding for adaptation will be inadequate (Parry et al., 2009). Top-down studies have been accompanied by another approach – the recent growth in bottom-up science studies and national plan-based approaches (Chapagain et al., 2020). In particular, there were a raft of studies done in the run up to the Copenhagen Conference of the Parties in 2009, given the attention to climate finance on the agenda, although more studies have continued to be produced subsequently, reflecting a greater range of methods.

What is clear is that adaptation costs are significant, that they are projected to increase into the future, and that as newer studies are published, the international estimates tend to increase. UNEP's Adaptation Gap Report in 2016 puts estimated costs of adaptation from US$140-300 billion by 2030, and by US$280-500 billion by 2050 (UNEP, 2016). This was an increase compared to the 2014 Adaptation Gap Report of two to three times by 2030 and potentially four to five times by 2050.

Figure 1 Estimates of adaptation finance needs at different time periods reported in different studies



Source: Dougherty-Choux, 2015

Against this backdrop of growing adaptation finance needs, there is still an adaptation finance gap. Climate finance flows have increased over time, reaching US$632 billion in 2019/20. However, over 90% of this is committed to mitigation finance. Flows of adaptation finance have also increased, reaching US$30 billion on average in 2017-2018 and US$46 billion on average in 2019-2020 (Climate Policy Initiative, 2019, 2021). However, although the proportion going to adaptation has increased over time, as of 2019/20 it was still only 7% of the total (Climate Policy Initiative, 2021).

3.2 Climate finance availability in South Africa is inadequate for adaptation needs

3.2.1 Climate change and adaptation implementation costs

The National Climate Change Adaptation Strategy (NCCAS) aims to support a "transition to a climate resilient South Africa, which will follow a sustainable development path, guided by anticipation of, adaptation to and recovery from a changing climate and environment to achieve our development aspirations" (Republic of South Africa, 2019). It has four strategic objectives: to build climate resilience and adaptive capacity to respond to climate change risk and vulnerability; to promote the integration of climate change adaptation responses into development objectives, policy, planning and implementation; to improve understanding of climate change impacts and capacity to respond to these impacts; and to ensure resources and systems are in place to enable the implementation of climate change responses. These objectives are met through nine strategic interventions, each of which has its own accompanying outcomes.

Whilst many of the studies project the costs of adaptation based on the total costs of negating future climate change and impacts, the NCCAS has been costed in terms of implementation costs. It is a 10-year plan that does not claim to definitively address all adaptation needs, and as a strategy rather than an action plan, the initial costing gives a preliminary indication of the quantity of finance that will be required to achieve its aims. This preliminary indication was determined by defining the scope of each strategic intervention and action based on information provided in the NCCAS, with particular attention placed on the definition of vertical (national, provincial, municipal) and horizontal (sectors) elements, and timeframes for implementation (short- to medium-term) for each action. Resource requirements and associated costs for actions under each strategic intervention were estimated according to human resources, infrastructure, equipment and technology, capacity development, and operational costs, through the application of various costing methodologies (e.g. bottom-up costing, top-down or parametric costing, analogic costing) to each action. The NCCAS has an initial cost of US$4.7 billion (R87.6 billion in 2019 values) to implement (Department of Environment Forestry and Fisheries, 2019). This is described as an initial cost estimate because the costing methodology was applied to a strategy rather than a tightly defined plan, and hence estimations had to be made to scope the strategic interventions. As a result, the total cost is likely to be an underestimate if the strategic interventions were envisaged to be nationally and universally achieved within the ten-year lifespan.

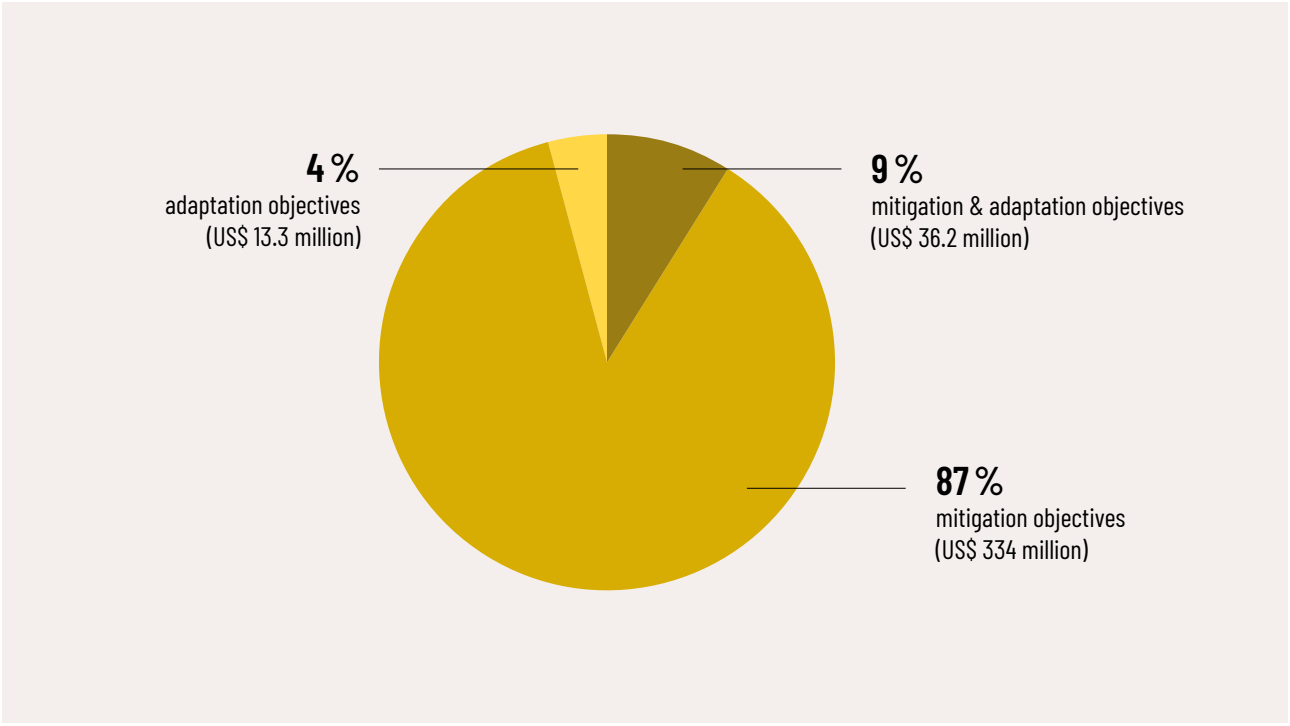
3.2.2 International climate finance flows for adaptation in South Africa

Mirroring international circumstances, and even though the cost estimate for implementing the NCCAS is less than the total adaptation cost, the receipt of climate finance for adaptation into South Africa means there is an adaptation finance deficit (Winkler, et al., 2021). Only 4% of the international development finance to South Africa (2014-2019) for climate objectives was for adaptation activities alone (Figure 2).

Investigation of this steep imbalance in international funding for adaptation versus mitigation suggests that the problem does not lie in implementation. Atteridge (2021) finds that the ratio for funding approved for South Africa (commitments by funders) and amounts actually paid out (disbursements) is high – 94% for adaptation – for 2014-2018, in comparison with the global average for development finance (84%). Project funds are generally disbursed in tranches over the course of a project, depending on project performance in prior phases of the project. A high disbursement ratio indicates that project implementation is meeting funder expectations (Savvidou et al., 2021).

Analysis of international development finance flows suggest some reasons, although they do not fully explain the imbalance in funding for adaptation seen in Figure 2.

Figure 2 International development finance disbursed to South Africa (2016-2019) for climate objectives is imbalanced in favour of mitigation objectives



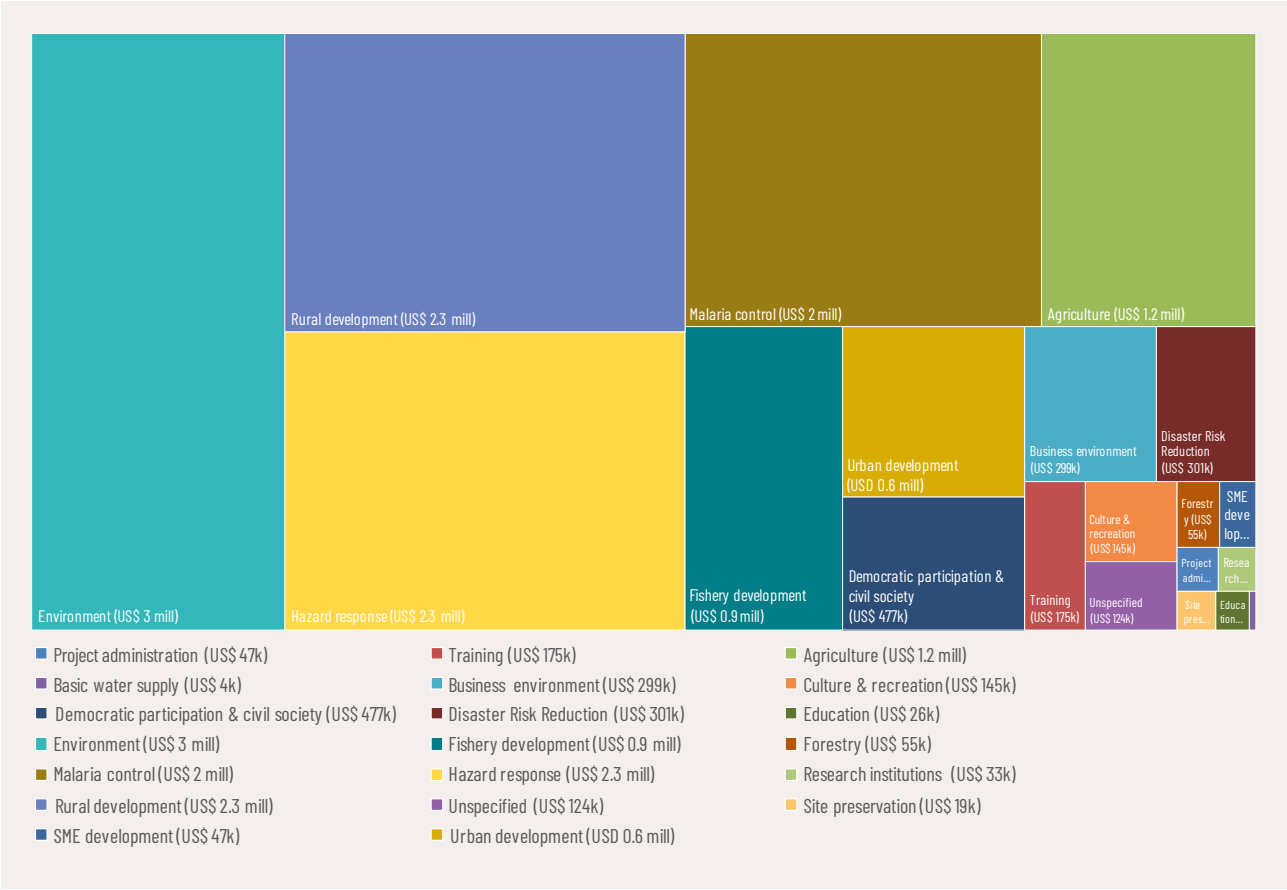
Source: authors' own based on data from Atteridge et al. 2019

Of the total amount of development finance targeting climate change objectives from 2014-2018, 81% are loans that need to be repaid – so proven returns on investment are needed to access these funds – and 12% are grants (Atteridge, 2021). Of the remainder, 3% were mezzanine finance instruments, which typically involve some debt and/or equity, and 3% were equity and shares in collective investment vehicles (ibid). The implication is that finance is available for interventions that yield direct profits in a timescale that is attractive for investors, and that a somewhat mature market is required to access these instruments.

Development finance institutions (DFIs) and climate funds offer highly concessional loans and/or blended finance to accommodate the longer term and indirect benefit nature of some adaptation investments. An example of this is a GCF-approved project for a venture capital firm based in New York for two multi-country projects that include South Africa (Green Climate Fund, 2022a, b). The projects target investors in commercial agriculture and investors in local government infrastructure, respectively. The "Catalytic Capital for First Private Investment Fund for Adaptation Technologies in Developing Countries" Project (CRAFT) is an equity instrument that aims to catalyse private sector capital to support investment in commercial agriculture technologies, including in South Africa (Green Climate Fund, 2021). The project is scaled-up from a smaller project funded under the Global Environment Facility and it aims to make investments available over the first five years of the 10-year project, to be repaid over the remaining five years (ibid). The project proposal suggests that equity investors can expect a return of two to three times the initial investment over the fund's life (Green Climate Fund, 2021). Implementation began at the start of 2022 and it is not unexpected that we failed to find publicly available information about project progress within the first year. The "Global Subnational Climate Fund" (SnCF GLOBAL) is also a blended finance project that seeks equity investments for which a GCF investment provides first-loss coverage to crowd in private institutional investors, to on-lend to subnational government for infrastructure projects (Green Climate Fund, 2022c). The project launched in April 2021, however there is no evidence of uptake in South Africa, where implementation has been delayed. This indicates that there may be an effectiveness trade-off in using international, rather than domestic, accredited organisations.

There is no agreed normative guidance for determining what 'fair share' of costs should be met by developed country party finance obligations under the UNFCCC in line with the principle of 'Common but Differentiated Responsibilities and Respective Capabilities', nor how global international climate finance might be shared between recipient Parties. However, it is evident that there is no upward trend in international climate finance over time to South Africa (Atteridge, 2021), which is in contrast with the global trend (Climate Policy Initiative, 2019). If international finance flows for 2016-2019 to South Africa are not increased, but remain constant in later years (allowing for inflation), then international climate and development finance – equivalent to the finance support and finance mobilised in terms of the Paris Agreement – will meet only 4% of the estimated costs of the NCCAS to 2030. Assessment of disbursed funds – monies paid, rather than monies offered – since ratification of the Paris Agreement also reveals that some key priorities for South Africa, like water supply, were ignored, and that rural development attracted more investment than urban (see Figure 3 and Table 2).

Figure 3 International development finance disbursed to South Africa (2016-2019) for adaptation showed preference for environmental, rural development and multi-hazard response preparedness activities



Source: authors' own based on data from Atteridge et al. 2019

Table 2 International development finance targeting adaptation objectives to South Africa, as self-reported by funders to the OECD

Sum of usd_disbursement	2015	2016	2017	2018	2019	Grand Total
Administrative costs (non-sector allocable)				37,088		**37,088**
Advanced technical and managerial training		174,587				**174,587**
Agricultural co-operatives					300,695	**300,695**
Agricultural development					145,053	**145,053**
Agricultural land resources					368,682	**368,682**
Agricultural research				0		**0**
Agricultural services	176,641					**176,641**
Agricultural water resources					243,188	**243,188**
Basic drinking water supply					4,161	**4,161**
Business policy and administration					398,965	**398,965**
Culture and recreation			144,559			**144,559**
Democratic participation and civil society	162,032	164,867	150,341			**477,240**
Disaster Risk Reduction					301,027	**301,027**
Environmental education/training				238,703	219,456	**458,159**
Environmental policy and administrative management	57989	68374		794,717	0	**921,080**
Environmental research	42,515	379,734	625,620		540147	**1,588,016**
Fishery development					941804	**941,804**
Forestry policy and administrative management			54,984			**54,984**
Higher education			21,346		4,604	**25,950**
Malaria control	655,110	416,745	378,297	376,512	230,748	**2,057,412**
Multi-hazard response preparedness		116,391		0	2,224,331	**2,340,722**
Primary education	0					**0**
Research/scientific institutions				32,570		**32,570**
Rural development				218,791	2,124,834	**2,343,625**
Sectors not specified				41,225	82,763	**123,988**
Site preservation		28,774				**28,774**
Small and medium-sized enterprises (SME) development				42,086	4,600	**46,686**
Urban development and management			281,645	288,572	40,501	**610,718**
Water supply - large systems				0		**0**
Grand Total	**1,094,287**	**1,349,472**	**1,656,792**	**2,070,264**	**8,175,559**	**14,346,374**

Source: authors' own based on data from Atteridge et al. 2019

3.2.3 Domestic finance flows for adaptation in South Africa

The assessment of domestic public finance flows for adaptation is partial because the way that finance flows and is currently recorded in the government finance system does not enable disaggregation of amounts for adaptation (Interview 2). Resilience premiums tend to be integrated within the budgets of different local government departments, and the adaptation 'additionality' cost is not captured (ibid). In their assessment of domestic government budget expenditure on climate objectives for 2017 and 2018, Cassim et al. (2021) tracked R4.6 billion per year equivalent to US$ 0.35 billion at the time), of which 80% targeted adaptation and dual mitigation and adaptation benefit activities and 20% targeted mitigation. They report that government spent the most on dual benefit activities, then adaptation and the least on mitigation (Cassim et al., 2021 p.9). However, the category 'dual benefit' hides the effective balance in funding[4].

In the absence of data for public expenditure on adaptation, the National Treasury Department has used proxies 'water and wastewater management' and 'environmental protection' to report on expenditure on climate resilience and adaptation (National Treasury Department, 2021, Pillay & Pillay, 2018). Knowledge about domestic investment in adaptation will be improved if a tracking system like those being piloted in National Treasury's current climate budget tagging project (See Section 4.1.5), or in C40's pilot in the City of Tshwane, are adopted.

The market for private domestic investment in adaptation is not yet defined. A recent assessment of finance flows for adaptation in 2017-2018 tracked R4.3 billion per year (equivalent to US$0.32 billion[6] at the time) (Cassim et al., 2021): Approximately 90% was from domestic public sources and the remaining 10% was blended finance[5]. Private sector finance flows for adaptation is, in theory, possible through grants, loans, debt and equity, but the assessment failed to track any such flows in South Africa (Cassim et al., 2021). In contrast, an annual R35.3 billion worth, (equivalent to US$2.7 billion at the time[6]), of private finance flows targeted mitigation (Cassim et al., 2021); Two reasons are advanced for this: First, the characterisation of adaptation and resilience as public goods align them to public rather than private financing (Persson, 2011; Khan and Munira, 2021). Second, finance tracking methodologies may be inadequate to capture evidence of investment by some private sector actors, for example for agriculture to transition to a state of resilience in the face of projected climate impacts (Archer et al.2019).

Of the combined domestic and international climate finance tracked for 2017 and 2018, adaptation activities accounted for R4.3 billion per year (equivalent to US$325 million at the time) or 7% of the total for mitigation and adaptation (Cassim et al., 2021). The relatively small amount of share for adaptation warrants investigation of the possible routes through which local government implementers could access funding.

4 The 'general ecosystem' category of activities receives the most funding and includes "projects focused on the reduction of Green House Gasses (GHGs), reduction of climate change linked risk (storm hardening, crop resilience etc.), disaster response post-climate change linked impact and natural resource conservation and management" (Cassim et al., 2021 p.6), so putting values to adaptation and mitigation would require information and budgets by activities for dual benefit projects.

5 Blended finance is the strategic use of development or climate finance to mobilise additional finance from the private sector; blended finance typically addresses risk of unattractive returns (OECD, 2018).

6 Our currency conversion calculation use South African Revenue Service published 'Average Exchange Rates', available at https://www.sars.gov.za/legal-counsel/legal-counsel-publications/average-exchange-rates/.

3.3 Multiple finance and funding sources for adaptation by local governments

Resch et al.(2017) suggest that in order to close the gap between adaptation needs and available funding, governments will need to tap an array of financial sources, including reshuffling existing public resources and seeking new sources for financing for adaptation. There are advantages and associated costs and risks associated with each of these potential sources for meeting climate objectives, and as a result, the options are differentially suitable for cities and municipalities of different sizes and socio-economic profiles (Table 3).

Table 3 Sources of climate finance, summarised from the DFFE's Training Manual for Climate Finance

Ways to finance	Examples of sources	Examples of using this mechanism for local climate action	Benefits	Barriers
Municipal rates, tariffs and taxes	Property rates; sale of water and electricity; development contributions; sale of sewage and waste collection services	Can use finance incentives and disincentive to influence behaviour of constituents.	Within the municipal council's control. Improving revenue collection can help fund larger climate action and municipal service delivery projects. No significant capital outlay is required.	Consider possible economic impacts of a deduction or increase in rates. Must not impact negatively on lower income families and households. Build broad political support from citizens.
Policies and by-laws	Spatial Development Framework; land use management; building control; water and electricity policies	Can help municipalities implement minimum standards for resource use, building and infrastructure design and placement through compliance, such as delineating 'no development zones' in 100-year flood zones or outlining restrictions for the use of potable water thereby encouraging the use of non-potable water.	Within the municipal council's control. No significant capital outlay is required. Can provide longer- term policy certainty and therefore support investment for climate action. Demonstrates political support to local climate action.	May require awareness raising and training for residents and businesses. Training may be required for municipal officials to undertake compliance checks, designation of peace officers, etc. May need to take a phased approach to implementation.
Sustainable public procurement	"a process whereby organisations meet their needs for goods, services, works, and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment"	Climate change considerations, such as resource efficiency and carbon emissions associated with the production and operation of what is procured, can be included in the technical specifications, functionality, eligibility criteria and/or the contract conditions for goods, construction or services.	Within the control of the municipality to implement. There are known solutions for climate mitigation that can already be included in procurement decisions, such as energy efficiency technologies. Co-benefits can be realised such as increased operational cost saving when considering resource efficiency interventions.	Need to overcome the perceptions of increased cost and that this is not required by legislation. When doing this for the first time, may take longer than simply following business-as-usual or taking the same approach as previously done. Data on local climate impacts is needed to make informed decisions.
Inter- governmental grants	Equitable share; conditional grants e.g. the municipal infrastructure grant	Municipalities can be proactive in utilising grants for local climate action through policies and by-laws and sustainable public procurement of infrastructure for service delivery using these grants.	More systematic and widespread inclusion of climate change. No restriction on municipalities including climate change considerations in projects designed for these grants.	Grants are mainly directed to capital expenditure, but this is changing to include operational considerations too. Climate change is a cross-cutting issue, but grants are still sector specific. Training may be required.

Public international funding	National governments of countries (taxes) across the world that have designated funds for climate action.	Increasingly, national governments that release international public funding through agencies are including climate change criteria as a minimum compliance criterion and/or developing specific funds for climate action.	Grant funding and concessional loans could help to reduce implementation costs. Grants need not be repaid so they can be used for projects with little to no direct return on investment, e.g., capacity building, strategy and policy development, financial and technical feasibility studies, etc.	Preparing projects can be expensive. Grant funding is associated with project reporting requirements that can be burdensome at times. Increasingly, international funds require that grants and concessional loans be used to leverage additional funding from the public or private sector.
Private capital market	Institutional and commercial investors – pension funds, banks, the sale and delivery of private goods and services	Private financiers are increasingly including climate change criteria when evaluating investment opportunities and risk. Going further, many impact investors are specifically looking to invest in projects that derive direct social, environmental and economic benefits, rather than just profit. Requires a strong business case for investment, i.e., demonstrate attractive returns on investment.	Private capital markets have significantly larger resources than the public sector, therefore greater amounts of finance can be leveraged. Private capital markets can provide the necessary upfront capital costs for projects when local governments do not have the resources to do so.	Preparing projects can be expensive. Money received needs to be paid back. The private sector is risk averse and requires guarantees for certainty. Reporting requirements to funders can be burdensome at times.

Source: based on ICLEI Africa 2019

3.3.1 Domestic public funds for adaptation at subnational level

In South Africa, cities already rely on a mix of revenue sources and grants to fund constitutionally-mandated expenditure responsibilities (South African Cities Network, 2020). The same principle applies for all types and sizes of municipality.

The National Treasury provides national Medium-Term Strategic Framework[7] (MTSF) budgets to government departments to implement their mandates under the umbrella National Development Plan "Vision 2030" (which is being revised in 2021/2022). The MTSF (2020-2024) mandates consideration of adaptation in terms of finance risk and MTSF guidelines require provincial government to consider climate risks in their budgets and municipal government to audit their infrastructure for climate resilience (Department of Planning Monitoring and Evaluation, 2019). The National Treasury also offers disaster grants for the relief and reconstruction phase of the disaster risk management cycle, however there are no grants available for disaster risk mitigation or reduction. The implication is that multiple departments share responsibility for adaptation, but that it is an underfunded mandate.

Public sector finance is typically channelled through national and sometimes provincial government departments, inevitably eroding the amount finally delivered to local governments. The flow of public funds from national to subnational governments includes intergovernmental transfers, known

7 The MTSF (2020-2024) specifies four climate change key performance targets for municipal government, which are: Greenhouse gas (GHG) emission reduction, municipal preparedness to deal with climate change, a just transition to a low carbon economy, and improved ecological infrastructure (Department of Planning Monitoring and Evaluation, 2019).

as conditional grants and subsidies. In addition to the annual 'Local Government Equitable Share' intergovernmental grant that local governments receive to support the provision of basic services, sectoral departments such as COGTA and Human Settlements make available conditional grants for municipal infrastructure development, and grants to support municipal disaster relief among other objectives and these are administered by the National Treasury in terms of its fiscal mandate (National Treasury Department, 2021). In 2019/2020 the National Treasury introduced a new infrastructure grant – the Integrated Urban Development Grant, to fund long term (10 year) capital expenditure frameworks aligned to the Spatial Development Framework (South African Cities Network, 2018), however only capital costs are covered. While no intergovernmental grants explicitly target adaptation or resilience objectives, it is possible to integrate climate objectives (Petrie et al., 2018) and to use conditional grants to leverage co-finance for the additional cost of climate proofing infrastructure investments (Pegasys, 2018a).

Uneven and at times inadequate financial health and viability mean that municipalities struggle to raise debt finance (Meyer & Neethling, 2021). Of the 278 municipalities in South Africa, 174 are in financial distress (National Treasury, 2022), and this is a constraint on access to debt financing, especially for large-scale infrastructure projects (Whiley, 2017). However, there are other options to generate revenue. Cities can, in principal, borrow against project income streams, including through bond issuance (South African Cities Network, 2020), but finance legislation and regulation – specifically the Public Finance Management Act (PFMA), and the Municipal Finance Management Act (MFMA) – for supply chain management procedures are perceived to add bureaucracy that slows down innovation in the implementation of adaptation and resilience investments (South African Cities Network, 2018). Most commonly, municipalities generate own revenue through property rates and user charges for services and could fund adaptation interventions through levying specific taxes and levies (Figure 4). Of the categories of municipalities[8] in South Africa, metropolitan municipalities (known as metros) have the most scope to raise own revenue, due to higher average household incomes and levels of employment, more diverse business bases, and the presence of the offices of national and provincial government departments and other government institutions (South African Cities Network, 2020). District municipalities have a relatively small revenue base for the reason that their mandate excludes service delivery (Interview 11). The Department of Statistics South Africa recently assessed that metropolitan municipalities raise around 83% of their own income, while local and district municipalities generate around 64% and 18% respectively (StatsSA, 2019).

Municipalities in South Africa have limited scope for borrowing; a low percentage of local governments achieve clean audits[9] each financial year (16% in the 2020/21) (Auditor-General of South Africa, 2022) so local governments may struggle to meet financial performance requirements of lenders. Only the cities with robust financial management practices and the capacity to prepare and package bankable projects would be considered ready for private finance (White & Wahba, 2019). South Africa's national

8 South Africa's multi-level governance structure is relevant to understanding local government capability to resource adaptation. South Africa's governance structure has three spheres, not levels: the national, regional (provincial) and local (municipal), each with distinct rather than cascading mandates. Each sphere has their own functions and powers and cannot transgress on the jurisdiction of another sphere. Municipal sub-categories are as follows: district municipalities include a number of individual municipalities; municipalities with more than 1 million inhabitants are termed metropolitan municipalities (or metro's); intermediate municipalities are large, but less than 1 million inhabitants; then there are small municipalities, which may be urban or rural. Duminy et al. (2020) explain that metropolitan municipalities are unique in that the South African Constitution defines them as having 'exclusive municipal executive and legislative authority' within their area. Smaller cities, towns and rural areas are governed by local and district municipalities and have overlapping spatial and shared service delivery functions (ibid). These distinctions are relevant to their respective capabilities to generate revenue.

9 Clean audits mean that the municipality complied with legislation governing finance management.

climate fund, the Green Fund, offers loans to municipalities through a 'Green Cities and Towns' funding window (Development Bank of Southern Africa, 2022). However, Green Fund loan rates are reportedly not competitive (City of Johannesburg, 2021) and SALGA reports that less than 4% of Green Fund finance reported landed in municipalities (Interview 8). The Fund is managed by the Development Bank of Southern Africa (DBSA) on behalf of DFFE, and DBSA is known to be oriented towards mitigation rather than adaptation (Schaeffer et al., 2015).

3.3.2 Local government capacity to mobilise private finance

Local governments can create private sector revenue sources through land value capture instruments (LVC), borrowing, and public private partnerships (PPP) (Junghans & Dorsch, 2015, White & Wahba, 2019). Development charges and impact fees, and tax increment financing are examples of LVC whereby governments create income on the basis of appreciation in the value of urban land, directly or indirectly related to investment in infrastructure adjacent to or linked to that site (Junghans & Dorsch, 2015, White & Wahba, 2019). An example of an impact fee is a levy on commercial developers that is used to fund affordable housing to meet demand that is in part stimulated by the commercial development (Junghans & Dorsch, 2015). A development charge is levied on private developers to contribute to the municipal costs of building or upgrading the necessary service delivery infrastructure (Junghans & Dorsch, 2015, White & Wahba, 2019). Tax increment financing aims to stimulate private investment by leveraging capital for public infrastructure investment on the basis of future increases in property tax revenues (Tänzler et al., 2017, White & Wahba, 2019).

Some of the larger municipalities have issued bonds and used the proceeds to fund climate objectives. The City of Johannesburg's 2014 green bond issuance proceeds were allocated to mitigation focused project such as waste-to-energy, low-carbon transport (hybrid buses) and solar water heating in for local residents (Climate Bonds Initiative, 2015). Proceeds from the City of Cape Town's 2017 issuance were allocated to adaptation objectives, including water management and coastal structures (Climate Bonds Initiative, 2022). Cape Town was at the time experiencing a multi-year drought associated with climate change (World Weather Attribution, 2018) and the City of Cape Town was working to avoid 'Day Zero', on which water restrictions would be ramped up to limit water supply to daily rations of 25 litres per person, to be collected from public taps only (Department of Water and Sanitation City of Cape Town, 2018). The drought drove an extensive capital expenditure programme to diversify water supply and at the same time the water restrictions threatened the cost-recovery design of funding for municipal water by rationing water (Simpson et al., 2019).

An assessment of the 200 largest developing country cities in the world scores Johannesburg among the top 10 'private investment ready' on the basis of nationally controlled regulations and systems, city financial management and reporting performance and project bankability (White & Wahba, 2019). However, South African municipalities are not permitted to take on foreign currency liabilities because of the risk of unfavourable currency fluctuation increasing the debt at the time of repayment (White & Wahba, 2019).

In public-private partnership arrangements either (a) private funds are secured as equity contributions and/or debt for infrastructure projects and the returns paid from future revenue streams directly

attached to those projects, or (b) funds are indirectly borrowed for projects and repaid from the general revenues of the city government/utility through dedicated fee arrangements. Public-private partnerships may also prove a way to improve the financial sustainability of climate change adaptation investments, although this may require a greater level of trust for government to be willing to hand over public funds to private enterprises for adaptation implementation (Interview 6).

Innovations in finance instruments, albeit tested by provincial rather than municipal government, include an insurance mechanism piloted by the Western Cape Province to transfer risk at the community level in that province for events such as flooding (Mohanlal, 2019). Municipalities rely on intergovernmental transfers and own budgets to pay damage costs arising from floods, making a self-insurance risk pool worth exploring (Pillay, 2020). Initial scoping of the potential for risk pooling across municipalities found that subsidisation may be required on an ongoing basis in the context of the most vulnerable communities lacking financial resources to participate, even via microinsurance schemes. Piloting the risk pooling mechanism in the Western Cape was facilitated by political stability – political control of both the province and many local municipalities rests with the same political party – as well as due to the geographical spread of the municipalities across different climate change hazards (Interview 6). However, an increasing frequency of floods may make risk pooling unviable, even for reinsurance.

The possibility of using insurance risk pooling as a finance mechanism in relatively frequent hazard-disaster risk regions like the KwaZulu-Natal Province (KZN), which experiences seasonal tropical cyclones, is to our knowledge unexplored. KZN has high rainfall variability and is subject to torrential downpours and flash flooding, however the frequency of extreme rainfall events in KZN has increased in recent decades (Ndlovu et al., 2021). In 2022, two floods, in April and again in May displaced more than 40 000 people, caused 459 deaths and left 88 people missing (Premier Sihle Zikalala, 2022); resulting damage costs to public infrastructure, including the washing away of roads, bridges and schools is estimated at R25 billion (equivalent to US$1.6 billion6 at the time). Damage to businesses is estimated at R7 billion (around US$0.4 billion6 at the time) and more than 45 000 people were left temporarily unable to work because their places of work were left unable to operate (ibid).

A proposed private sector financing instrument that would be relevant for subnational government is an innovation called Climate Adaptation Notes (CANs) (The Lab, 2020). CANS offer to fund water- and waste-related adaptation infrastructure projects in Southern Africa by combining short-term construction finance from commercial banks with long-term post-construction refinancing from institutional investors and impact investment funds (ibid). The commercial banks' construction project expertise reduces the technology and project performance risk for the long term investments (Amirali, 2020, The Lab, 2020). Packaging the short- and (pre-agreed in principle) long-term finance in one instrument aims to streamline time and costs involved in financing (The Lab, 2020), and promote rollout of technology innovation. There is, however, in general a lack of evidence on the effectiveness of blended finance solutions in this context (Amirali, 2020).

3.3.3 International climate finance flows to subnational level

Cities are advised to seek international public funding only after exhausting other possible sources, having looked first to their own budget, including intergovernmental transfers and own revenues and then to private sector finance where there are proven returns on investment (ICLEI Africa, 2019a). International climate finance can be accessed by local governments if they coordinate with national `accredited entities, although this commonly requires co-funding, which is a deterrent for municipal officials (Petrie et al., 2018). Co-funding requirements create challenges of matching complementary finance instruments, and because accessing international climate finance is a multi-year process from the point of concept development and approval to disbursement, in comparison with commonly shorter timelines for private finance (ibid). City officials report that inadequate technical capacity, insufficient resources (time), inadequate profile of climate change staff to influence large municipal programmes, and insufficient support and diversity in type of accredited entities has prevented progress applying to climate funds (Pegasys, 2018b).

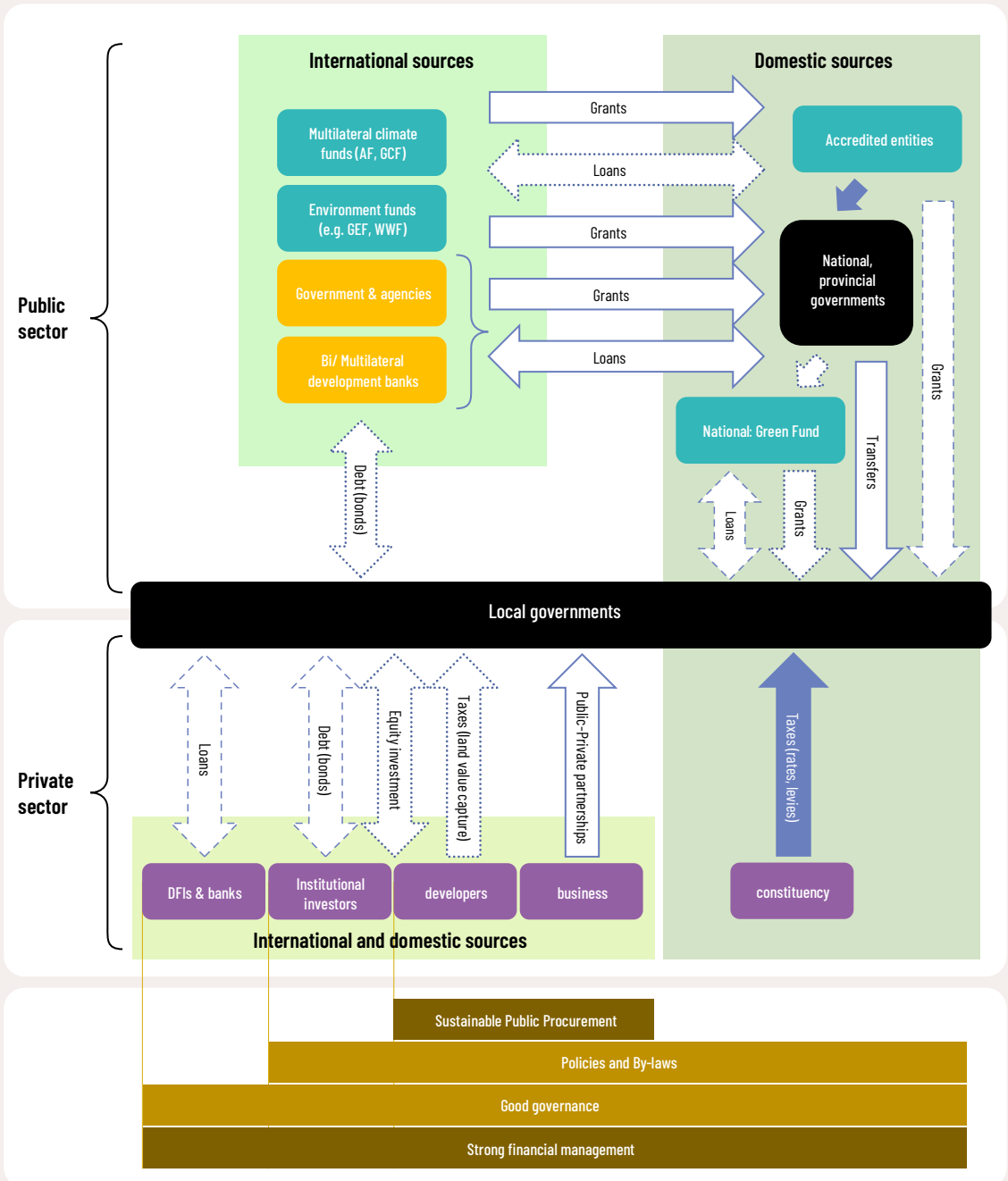
The uMgungundlovu District Municipality is a current example of district municipality that has accessed climate adaptation funding, as it has acted as the executing entity of the project "Building resilience in the Greater uMngeni Catchment, South Africa", known as the uMngeni Resilience Project. The project has a grant of US$7 495 055 which is funded by the Adaptation Fund via South African National Implementing Entity SANBI (South African National Biodiversity Institute, 2018). This project provided support to peri-urban and rural communities and small-scale farmers to reduce their vulnerability and increase their resilience to cope with extreme weather events through interventions at four pilot sites, which included establishing early warning systems, infrastructure investments to climate-proof settlements, supporting climate-smart farming techniques and a capacity building and learning component to share lessons, policy recommendation and support scale-up and replication. This 5-year planned project began implementation in December 2015, but experienced significant delays in implementation to component two that related to infrastructure interventions to climate-proof settlements and experienced further delays due to the impact of COVID-19 (South African National Biodiversity Institute, 2018).

The Adaptive Capacity Facility (ACF) is a current example of bilateral finance support to three municipalities over a five-year period (Garden Routh District Municipality, 2021), in which the funding offer was initiated by the Government of Flanders to the DFFE (Interview 11). The DFFE approached candidate municipalities and sought evidence of recent climate change activities, and project implementation and public participation performance. The Garden Route District Municipality (GRDM) submitted evidence collated from its local municipalities and DFFE consulted with GRDM and stakeholders in a process that included site visits and discussions about proposals to address key risks in the district (ibid). Risks associated with drought in the Klein Karoo inland area of the GRDM and air quality were considered, but fire risk was identified as the biggest risk in consultations that included the South African National Parks (SANParks). The area has vast tracts of commercial plantation and heritage natural forests and had experienced devastating wildfires in 2017/2018 (Garden Routh District Municipality, 2021). Stakeholders from the GRDM, the DFFE team leading the ACF and other critical stakeholders collaborated to develop the work programme. Interventions include: i.) Ecosystem-based fuel load management through firebreaks for forestry communities and alien vegetation clearing; ii.) fire early warning and monitoring cameras and towers; the provision of fire-fighting toolkits for communities living in fire hazard areas; and iv.) a training facility to train local communities how to

respond to wildfire (Garden Routh District Municipality, 2021). The main challenge within the project is financial administration because the funder specified that national government secure service providers, but procurement processes within national government have stalled for reasons of capacity within national government (Interview 11). Construction of the fire-preparedness training facility requires the usual environmental impact assessments and licencing and planning proposals before construction can start, and these processes typically take months to complete. GRDM was recruited into the ACF two years after the start of the project, which ends in 2024, so project outcomes are at risk unless the project itself is adapted to overcome bureaucratic hurdles.

The South African experience shows that for project concepts to be taken forward, they require both a champion and a budget (Interview 3). The level of seniority of the champion may also impact significantly on what they can achieve, as more senior staff are able to effect more change, more quickly, and bring together a wider range of stakeholders. In the city of Durban in eThekwini Municipality, an important element in the city's climate change adaptation interventions, despite the changing available resources and knowledge, was the cultivation of institutional champions who could identify points of integrative action and help cast climate change as a development issue. This enabled the implementation of responses even though adaptation was considered an unfunded mandate (Chu et al., 2017), as these were considered to be essential functions that affect development, although beyond the powers and functions of local government listed in Section 156 of the Constitution (South African Cities Network, 2018). Debra Roberts, as the head of the Environmental Planning and Climate Protection unit, became a key champion in making Durban a leader in climate change adaptation (Carmin et al., 2012). Similarly, the City of Johannesburg demonstrated greater progress in addressing climate change when Mayor Park Tau was the chair of the C40 Network (Interview 6). Cities such as Cape Town and Durban, which have dedicated departments driving this agenda at a more senior level, have demonstrated more progress in mainstreaming resilience and adaptation into their planning and budgeting; their Spatial Development Frameworks take into account climate vulnerabilities and risks and their Integrated Development Plans include climate-specific monitoring and evaluation indicators (Pegasys, 2018c).

Figure 4 Funding for adaptation can flow to local government from a range of sources; foundational public policy mechanisms underpin private sector flows



Blue solid arrows indicate flows that are well established in terms of funding adaptation.

Arrows with a dashed outline indicate finance flows that are less common, and those with a dotted outline were least common. The latter indicate finance flows for adaptation that are in theory possible but which we found no examples of in South Africa.

Turquoise for climate actors, black for domestic government, yellow for foreign government and agencies, purple for private sector actors.

Brown (imagine bricks) are the foundational local government policy mechanisms to support finance flows.

Source: authors' own based on figures in Pillay and Pillay 2018; ICLEI Africa 2019b

3.4 Barriers to accessing climate finance by subnational actors

Despite the array of potential climate finance sources, various barriers exist. This has led to a situation where less than ten percent of international public climate finance from international climate funds reaches the local level (Lewis et al., 2017). Most adaptation finance is managed by multilateral entities and national government, with only a small portion channelled to the local level, and fewer still to locally-designed and led initiatives, perpetuating existing inequalities within countries (Colenbrander et al., 2018).

3.4.1 Systemic barriers in the climate finance system

Many of these barriers to accessing climate finance lie upstream, such that only a small portion of climate finance reaches local governments, with even less reaching community organisations or small businesses, with vulnerable communities having little say in how such funding is spent (ibid). Common barriers to financing local adaptation initiatives include the exclusion of subnational entities from national and international decision-making; legal obstacles to local structures accessing climate finance; economic requirements from donors that often favour large infrastructure projects as smaller projects are thought to have higher transaction costs; and lack of technical capacity to navigate climate finance architecture, manage large funds or implement adaptation projects in local institutions. Shakya et al. (2019) suggest that climate finance is currently caught in a trap of short-term projects, rather than providing the long-term predictability required for institution-building and strategic climate action.

Access by subnational government entities to climate funds has likewise been limited by the set-up of the climate funds and the complexity of accessing these funds (Omari-Motsumi et al., 2019). The requirements of climate funds for applicants to show the additionality of investments – to ensure that the finance is not repurposed ODA – adds complexity to the application process and is essentially based on a false dichotomy being drawn between adaptation and development actions, preventing investments in resilience from addressing immediate adaptation needs (Patel et al., 2020) (more about this in Section 5). The Green Climate Fund's (GCF) ongoing effort to apply a complex incremental cost approach to financing adaptation, even though developing countries should be eligible for full-cost funding, is an additional barrier for local access to climate adaptation finance (Patel et al., 2020). In contrast, whilst the incremental costs of adaptation must be distinguished, the Adaptation Fund (AF) provides funding for projects and programmes "on a full adaptation cost basis to address the adverse effects of climate change", with no specific requirement for co-financing (Adaptation Fund Board Secretariat, 2010).

The cost of mobilising adaptation funding can be significant and must go hand-in-hand with sufficient implementation capabilities for institutional strengthening, project management, capacity building and monitoring and evaluation (Omari-Motsumi et al., 2019). Climate funds generally set a cap on project management fees to keep these as low as possible, which may not be sufficient to support direct access entities delivering adaptation projects at the small and micro levels (ibid). Donors target the scalability of projects and how they can contribute to long term transformation at country level,

as well as project sustainability and the ability of projects to be self-sustaining after funding ends, which may be enhanced by national ownership as well as clearly identifying and mitigating potential risks (Ellis & Pillay, 2017). Scalability and transformation at a national scale is not guaranteed because adaptation responses vary by location, and the preference for scalability is at odds with meeting these locally-specific adaptation needs.

Private sector investment in adaptation remains limited as there are no clear models around costs, returns, viability and timelines for such investments (Somorin et al., 2021). To boost private sector investment into the adaptation aspects of development, stronger public-private engagement is needed, including through cost-benefit analysis (of projects) that includes non-monetary costs and values (Somorin et al., 2021). This could be strengthened by the mainstreaming of climate change risks and vulnerabilities into sector policies and plans. Possible public policy interventions could include providing targeted financial incentives for private sector engagement in adaptation projects. For many adaptation projects it remains difficult to generate demonstrable returns on investment (Omari-Motsumi et al., 2019) with the implication that public sector grant finance will likely continue to play an important role in adaptation finance.

3.4.2 Weak capacity in subnational governments to access climate finance

Many local governments are limited by weak capacity for adaptation planning and appear to lack the technical capacity or political will to implement meaningful adaptation plans, including integrating climate finance into their planning and budgeting processes and accessing international climate finance (Susskind & Kim, 2021). Municipalities appear to struggle to relate risk reduction to policy messaging, both in the development of their adaptation strategies and later in translating the policy context into on-the-ground projects (Interview 1). Chu et al. (2017) suggest that a deliberate focus on integrating adaptation into development priorities is more likely to embed adaptation into local governments' programmes and practices, and can lead to greater local buy-in. However, this requires climate change technical capacity across departments, especially for planning and finance.

A significant barrier to local access to adaptation finance is that local actors frequently demonstrate an incomplete understanding of climate risks and uncertainties (Soanes et al., 2021). The mapping of needs against vulnerability assessments requires technical capacity and takes time, as does the process of translating vulnerability assessments into project plans. Locally-led adaptation interventions should ideally be planned from the bottom up, with climate risk assessments that build from local communities understanding of climate change risks and resilience pathways rather than relying solely on averages of downscaled projections, as local governments have frequently been seen to do (Soanes et al., 2021).

Both the AF and the GCF have made significant investments in capacity building and readiness support to developing countries seeking to access their resources. However such resources typically target national institutions, and there is limited support available to support subnational governments (Omari-Motsumi et al., 2019). Much of the GCF's funding support for climate finance readiness has gone into supporting national entities to develop strategic frameworks for investment and to build the

necessary institutional, technical and fiduciary capacities to manage climate funding, rather than how to make climate projects bankable (Ellis & Pillay, 2017). Ellis and Pillay (2017) note that the GCF has been constrained in the disbursement of funds due to the poor quality of projects submitted, the approval of projects with conditionalities which may make projects more difficult to implement and cause significant delays, and a long pipeline of concept notes. A critique of the model and requirements for finance delivery is that climate funds could improve their efforts to empower local institutions, rather than defining success as an accumulation of successful individual projects (Patel et al., 2020). Susskind and Kim (2021) note that short-term technical training tends to fall short of meeting capacity needs unless it is accompanied by a system to support long-term and sustainable support. This is particularly challenging in the context of climate change, as efforts to adapt to climate change require continuous adjustment, ongoing monitoring, testing of interventions and readjustments, and not a one-time commitment to building something. This is adaptive capacity, which the Intergovernmental Panel on Climate Change (Nicholls et al., 2007 Section 6.6.4) defines as the 'ability of a system to evolve in order to accommodate climate changes or to expand the range of variability with which it can cope'.

3.4.3 Structural issues affecting subnational government capacity

Capacity related to accessing climate finance is only one aspect of lack of capacity that most local governments in South Africa face, particularly outside of large metropolitan municipalities, and this is not necessarily specific to climate change. Municipalities across South Africa are underprepared for the impacts of climate change, and preliminary investigations reveal that the municipalities that are most vulnerable are the least prepared (South African Local Government Association, 2022). Poor budgeting and low expenditure on repairs and maintenance are blamed for failing municipal infrastructure (South African Local Government Association, 2022). The challenges identified in the Local Government Climate Change Support Programme suggest that weak capacity and systemic barriers are mutually reinforcing (Table 4).

Table 4 Challenges identified in the Local Government Climate Change Support Programme

Human resource	Finance	Mainstreaming
Municipalities are severely under-resourced	Climate change is an unfunded mandate	Climate change is a cross-cutting function – and coordinating other sector departments is a challenge
Lack of dedicated official to access climate change mandate / activities	Lack of finance hampers on implementation	Identified climate change projects often don't have budgets allocated to them
Lack of buy in from political / executive members	Difficulty in accessing climate finance e.g. donor funds	Understanding climate change projects vs. developmental / environmental mandates

Source: DFFE 2022a

Periods of political transition and instability result in shifts in policy mandates and barriers to decision-making in hung councils. Following local government elections that change the political governance, some metropolitan municipalities, including cities such as Johannesburg and Tshwane, have witnessed a diminished focus on climate change adaptation responses (Interview 6). There also tend to be blockages in implementation due to the different jurisdictions between provincial and local government, and understanding who is responsible for which actions, such as coastal and road management, which have both provincial and municipal jurisdictions (Interview 1). In the Western Cape, the fact that the same political party governs the provincial government and controls most municipalities means that there is more interest in cross-municipal projects such as insurance pooling (ibid).

SALGA encourages municipalities to leverage opportunities in the fiscal grant framework and lobbies for reform in the grant system to eradicate some of its systemic barriers. These barriers include that i.) the Municipal Finance Management Act works on a three-year cycle which can be enough time for feasibility and pilot studies but fail to cater for implementation; ii.) local government officials outside of finance departments carry the additional burden of investigating regulatory instrument conditions on conditional grants, equitable share of revenue etc., and iii.) capital grants are performance-based and in tranches, and do not include operational budget, so staff costs are not covered (Interview 8).

A longstanding problem is that municipalities underspend on grants, especially national grants for infrastructure, with an estimated 40-60% of Municipal Infrastructure Grants going unspent (Interview 8). Unspent grant monies are returned to the fiscus for reallocation, and underspending municipalities get reduced budgets in the subsequent year. Capital budgets unspent represent services not delivered (Wall et al., 2012). Reasons put forward to explain underspend in South Africa include project management problems such as a lack of project management expertise and failure to monitor and evaluate during the project life cycle and manage change in the projects (Kopung et al., 2016). Systemically, the National Treasury also identified inefficient supply-chain management as an issue, leading to proposals to separate processes and regulations for service delivery from those for the delivery and maintenance of public infrastructure (Wall et al., 2012).

Globally, investigations of local government capital underspend highlight poor financial autonomy (municipalities that can raise own revenue can better spend) (Anessi-Pessina et al., 2012, Mathew & Moore, 2011), relatively low expenditure on personnel and/or interest payments in relation to revenue (Anessi-Pessina et al., 2012), and that a high proportion of poor people in the demographic negatively impacts local government's ability to spend (Mathew & Moore, 2011). All these factors are present in the context of local government in South Africa, and where the municipalities most vulnerable to climate change are also the municipalities in poor financial health, the current fiscal system entrenches issues of unequal resources (Interview 8).

Chapter four

Enhancing finance for adaptation in South Africa

4. Enhancing finance for adaptation in South Africa

Based on the review of literature and interview data, and in light of the current situation of inadequate access (and availability), this section proposes various options that could increase the flows of adaptation finance to subnational level in South Africa.

4.1 Increasing capacity to access existing climate funds

As with other developing countries, South Africa has the potential to link climate finance costs with development actions, and identify and seek climate finance to meet the climate response-apportioned costs from either domestic or international sources (Resch et al., 2017). Many service delivery-oriented projects at municipal level could be suitable as adaptation projects if designed in terms of reducing vulnerability to climate risk and improving resilience to climate impacts, or municipalities could seek co-financing for the climate change aspects of these projects (Interview 2). In many cases, since the size of projects from smaller municipalities is too small for international public climate finance, this makes it even more important that they rely on existing domestic sources (Interview 4). Regardless, the type of capacity that needs to be built – to identify climate risk and adaptation options, then define bankable projects and be able to manage resources effectively for implementation – are common to subnational government, regardless of the source of finance.

4.1.1 Increasing efficiency of accessing domestic resources

SALGA expects that municipalities will resource most of their climate finance needs, and that the scale these needs necessitates that local governments mainstream adaptation into service delivery and infrastructure delivery and maintenance (Interview 8). SALGA's preliminary assessment of the climate readiness of municipal infrastructure is that key economic and social infrastructure remains highly exposed and at risk to the impacts of climate related hazards, especially in the most vulnerable municipalities, although noting that the range of the extent to which integration had been achieved between the most and the least climate-ready municipalities is relatively small (Chauke, 2022). Long-term maintenance budgets especially will need to be updated to provide for adaptation interventions like water reticulation and the resurfacing of roads in response to water availability and increasing temperatures (Interview 8).

Institutional leadership can be an important factor in determining how well climate change is integrated into budgetary processes, while having specific climate change champions within government can enable climate finance to be mainstreamed within government institutions, plans and budgets (Resch et al., 2017). Climate change adaptation in particular requires adaptive governance, with ongoing decision-making and learning processes involving key stakeholders in meaningful

ways in community-wide decision-making (Susskind & Kim, 2021). Intra-institutional coordination of support and capacity building may be needed; C40 addressed this by embedding City Advisors in member cities working on their climate action plans (Interview 4). C40's Cities Climate Action Planning program supports the preparation of bankable climate projects, develops the financial capacities of city administrations and initiates partnerships between cities and prospective financiers (including climate funds). The Climate Action Planning program in the African region provides expert technical assistance and capacity building and an embedded "city advisor" to provide coordinating capacity in each participating city (Interview 4). Processes to develop climate action plans are supporting municipalities to define priority actions and to identify activities and programmes that are already underway, that reduce vulnerabilities and improve resilience to climate change (Interview 10; City of Cape Town, 2021a).

4.1.2 Efforts to enhance private investment

To date, private sector engagement in adaptation has been very limited. The National Business Initiative (NBI) and SANBI partnered in 2019-2021 in a process of identifying and developing public-private partnership proposals for submission to the GCF (National Business Inititaive, 2020). The partnership uses GCF Readiness Programme support as part of SANBI's strategy to alleviate the acute shortage of domestic adaptation projects. The NBI-SANBI team held a series of workshops with climate finance and private sector stakeholders to identify existing private sector initiatives that could contribute to a national pipeline of adaptation, biodiversity and ecosystem-based adaptation actions. The workshops were rolled out in three phases to i.) build awareness of stakeholders about climate science, adaptation and finance, ii.) develop a community of practice of multiple stakeholders with an understanding of what projects are both suitable for adaptation finance and can be combined to provide impact at the necessary scale, and iii.) identify a few high promise projects for incubation and further development (National Business Inititaive, 2020). The last phase of the project involves NBI and SANBI supporting the development of at least three detailed project concepts which will need to be demonstrate sufficient 'adaptation rationale' and be sufficiently large scale or lend themselves to be aggregated with other activities to be bankable for the GCF (Tshindane, 2021).

4.1.3 Building capacity to access international public finance

For developing countries to access international climate finance, they need to be able to both identify suitable sources of funding and then to develop strong, fundable project proposals that meet the requirements of these funds including, the climate rationale (Ellis and Pillay, 2017; Somorin et al., 2021). One of the mechanisms with the potential to increase national agency in channelling climate funding is the use of direct access modalities, with national institutions accrediting to climate funds to access and programme funding at the local level. For developing countries, an important first step to accessing international climate finance through the major climate funds such as the Green Climate Fund and Adaptation Fund is therefore national accreditation.

South Africa has achieved national access through the accreditation of SANBI in 2011 to the Adaptation Fund as a National Implementing Entity. SANBI subsequently used the fast-track accreditation process to accredit with the GCF as a Direct Access Entity in 2016 with the ability to submit projects of up to US$50 million. SANBI has since developed mechanisms within their accreditation to provide access to support the subnational level. There remains the potential for additional national entities to follow in SANBIs footsteps and accredit to these funds and address adaptation needs across a wider range of sectors. Accreditation requires a track record of fiduciary, environmental and social standards equivalent to United Nations and multilateral development banks (Soanes, Bahadur, et al., 2021), and accreditation does not guarantee funding (UNFCCC Secretariat, 2020). If additional entities are able to attain accreditation, they may face the typical systemic upstream issues cited in Section 3.4.1.

SANBI's efforts to bridge the gap between international funders and local implementation are remarkable as an example of building sub-national ownership. SANBI's efforts have meant additional capacity building and hands-on support to local communities and civil society organisations, and the inclusion of sectoral and local governments and private sector actors in identifying project ideas with capacity to potentially meet the bankability requirements of the GCF, albeit at a much smaller scale. Work on SANBI's current project pipeline (summarised in Table 5) will take them until at least 2023-2024[10] with an anticipated intense workplan; SANBI will not have the capacity to consider any other proposals during that period and until further funding is available through the administration of projects under implementation (Interview 7). The current multilateral climate funding mechanisms mean that while assistance is available to national entities for project development, this is only available in the form of consulting fees, and not staff time to manage or conduct this work. Hence the bilateral funding support from the Government of Flanders to employ additional staff to manage this process and provide technical support has proven essential. SANBI's work and experiences offer learnings for further expanding and deepening subnational ownership and capacity building in more sectors.

10 Information about the process of developing the pipeline is available in Section A.3 annexed to this report.

Table 5 SANBI's GCF project pipeline has seven proposals and concepts

	Approach	Target group & locations	Lead & implementing partners	Planned submission & funding amount
1	Ecosystem based adaptation to manage disaster risks	District municipalities in regions vulnerable to flood, fire, drought 7 district municipalities in 5 provinces	Department of Forestry, Fisheries and the Environment, National Disaster Management Centre	Proposal March 2023 US$20-30 million
2	Ecosystem based adaptation for transforming smallholder farming systems, including EWS (building on URP)	Vulnerable smallholder farmers Kwa-Zulu Natal, Eastern Cape, Mpumalanga and Limpopo	Provincial governments (4) Department of Agriculture, UKZN (delivery partner)	June 2023 (tentative) US$10 million (GCF Simplified Approval Process)
3	Ecosystem based adaptation for water security	Strategic water areas 11 priority Strategic Water Source Areas, focusing particularly on the 3 largest (have the most downstream users and this the highest number of people at risk)	Department of Forestry, Fisheries and the Environment, Department of Water and Sanitation, SANBI	Funding proposal tentatively planned for submission November 2023 US$20 -30 million
4	Coastal EbA/Ecological Infrastructure	Coastal provinces & metros Coastal provinces (4) and metros	Department of Forestry, Fisheries and the Environment-Oceans and Coasts branch and Provincial lead agencies	Concept note mid-2022 Funding proposal to be confirmed US$ to be determined
5	Ecological Infrastructure: aquifer recharge	Water insecure provinces Western Cape Province, possibly North West Province	Western Cape Government Department of Environmental Affairs and Development Planning (DeA&DP)	Concept note mid-2022 Funding proposal to be confirmed US$ to be determined
6	Just Transition project in Mpumalanga that focusses on vulnerable communities affected by SA's energy transition	Vulnerable communities in coal region Mpumalanga Province, tentatively Nkangala District	Mpumalanga Province, WWF-SA	Concept note mid-2022 Funding proposal to be confirmed US$ to be determined
7	Enhancing South Africa's Community Adaptation Small Grants Facility (upscaling AF SGF)	Vulnerable rural communities	Civil society organisations	Concept note mid-2022 Funding proposal to be confirmed US$ to be determined

Source: adapted from information presented in Interview 7

Various support programmes have run in South Africa in an attempt to address the gap in capacity to identify projects suitable for climate finance, and to support the process of refining concepts and bankable projects (Table 6). These include the Local Government Climate Change Support Programme, various city-focused initiatives, for example by C40 Cities and the South African Cities Network, ICLEI's global Transformative Actions Programme, and SANBI's GCF pipeline development process, for which additional funding was sought to expand technical support (Table 5).

Table 6 Examples of support programmes for municipalities relating to climate change and finance

Programme	Activities	Key outputs	Key lessons
Local Government Climate Change Support Programme (LGCCSP)	Provided training and supported municipalities to conduct vulnerability assessments Provided training of provincial and municipality officials to conceptualise and package projects and proposals for climate finance	'Let's Respond' toolkit to integrate climate risks in planning (DEA, 2018b); Training manual on producing project proposals (ICLEI Africa, 2019a); Preconcepts developed and three were taken forward to proposals and submitted to the DFFE	The small number of projects developed highlights a need for further project development support
ICLEI Transformative Actions Programme	Provided short training to local and regional governments to develop bankable climate infrastructure projects, linking with investors and project preparation facilities	Five (energy and waste) projects from Africa have been funded (including one from Tshwane)	South African cities have taken advantage; projects from smaller municipalities are typically too small
C40 Cities Climate Action Planning Programme	Embeds and funds policy advisors in cities for 1-4 years	Has developed policy documents, e.g. Durban's Transformative River Management Programme	Reported outcomes suggest more success with policy development than with implementation (C40 Finance Facility, 2020)
C40 Climate Finance Facility	Supports cities to develop and source funding for climate change infrastructure projects	Convened municipal knowledge exchanges on care and restoration of riverine systems to protect against floods (C40 Finance Facility, 2020). Support for investment proposal development e.g., green infrastructure for flood alleviation and improved catchment management in Cape Town	
South African Cities Network (SACN) Sustainable and Resilient Cities programme	Promotes exchange of information, experience and best practices on urban development and city management; reports on city performance	Research reports on cities including the State of South African Cities Reports	
SANBI's GCF pipeline development capacity support	Supports pipeline of project development (locally led adaptation grant facility) in line with their Direct Access Entity accreditation for managing grant funding for micro and small adaptation projects (up to US$50 million), including through technical assistance	Call for EOIs has led to the submission of ideas generated by national and subnational entities. Three concepts submitted to GCF so far, and a further four for development. Some of these concepts include municipal implementation.	Time and effort to support concept development limits the number of efforts that can be taken forward

Source: authors' own

Capacity building has long been tied to development assistance through the provision of both financial and technical aid to developing countries and early development efforts illustrated that the provision of financial assistance alone, without improving management abilities was not sufficient to drive change (Susskind & Kim, 2021). For capacity to be built and for learning to happen, more predictable and flexible climate finance is needed over longer timeframes, including the provision of more accessible incubation finance to allow actors to fine-tune their approaches and build local capacity through learning by doing (M. Khan et al., 2019, Patel et al., 2020). Ziervogel et al. (2021) suggest that providing training only in the form of once-off training workshops is unlikely to mobilise capacity at the scale it is required to effectively address climate change adaptation, and suggest that the empowerment of actors to capacitate them to mobilize resources, and of institutions to achieve a goal, is also key for the second phase of capacity building, which is implementation. This was reiterated by interviewees who had been involved in capacity building efforts, who recognised that short duration workshops likely did not provide enough support to realistically enable subnational actors to be able to actually develop their own concept and proposal (Interviews 4, 8, 9). Capacity building is also often contingent upon a critical mass of staff within local government understanding climate change and the opportunities for projects that support adaptation, as well as the technical expertise to actually develop a concept and proposal.

4.2 Enabling more effective tracking of climate expenditure

As well as building capacity to better access funds, there is a need to be able to better monitor progress by tracking the extent to which subnational government spends on adaptation (from all sources). Efforts to track and enhance finance flows include climate budget tagging for the public sector and a national green taxonomy for the finance sector.

4.2.1 Piloting Climate Budget Tagging (CBT) methodologies

The National Treasury is piloting a system for public climate budget tagging (CBT). The pilot, funded by the World Bank, aims to improve government awareness and capacity to integrate climate risks into planning processes in all three tiers for government, to create incentives for government to improve the climate relevance of own-revenue flows and to improve the effectiveness of climate-related spending (National Treasury Department, 2022a). Climate budget tagging (CBT) is a system used to track climate finance and can be applied to budget allocations, expenditures, or revenues. CBT is applied to i.) influence budget and policy decisions in the direction of climate relevance; ii.) improve the effectiveness of climate-relevant budget and policy decisions; and iii.) enable accountability for climate change responsibilities and reporting on climate change strategies, plans and commitments (Interview 2).

It is unclear whether there is sufficient capacity in various tiers of government to implement a CBT system using the pilot's proposed budget tagging methodology, particularly at local government level (Interview 2). CBT requires additional effort from line departments in an already congested and demanding budget process, particularly as tagging would be done by the line departments themselves.

The process of doing the tagging would build awareness and capacity within departments, which would be lost if this was done externally and ex-post by the National Treasury for instance (ibid). National Treasury may choose to phase in a CBT approach before rolling it out further, starting with national government and the most relevant sector departments, or it may ultimately abandon the process and rely rather on periodic studies to gain this information.

4.2.2 South Africa's first Green Finance Taxonomy

National Treasury launched the first national Green Finance Taxonomy (GFT) on 1 April 2022. Development of the GFT included public consultation and a pilot test by seven volunteer financial institutions to produce a voluntary tool to track, monitor and demonstrate climate change mitigation and adaptation credentials of environmentally sustainable economic activities (National Treasury Department, 2022b). The GFT guides the assessment of adaptation activities in terms of whether they are i.) 'adapted' – identified through a vulnerability assessment of risks posed by current weather and forecast climate hazards – or ii.) enable adaptation by reducing risk to other activities or iii.) address systemic barriers to adaptation (ibid). The GFT is intended to encourage transparency through disclosure, and enhance credibility – for example it requires entities to disclose whether the vulnerability assessment was done by the reporting entity itself, or by an independent third party (National Treasury Department, 2022b).

The GFT offers a basis for a regulatory instrument (ibid) for the Financial Sector Conduct Authority to assess finance sector risk and uncertainty, for the South African Reserve Bank (SARB) to assess risk related to monetary policy, or for the Prudential Authority to encourage the provision of funding for green investments. Future editions of the GFT may include additional benchmarks, for example for biodiversity. The GFT may be relevant for how private investment might be tracked in future.

4.2.3 Articulating and prioritising local adaptation needs

Municipal climate response priorities are related to their service delivery mandate. City's climate action plans are useful informants of their most pressing priorities. Three metros – the Cities of eThekwini, Johannesburg and Cape Town – have produced climate action plans[11] (CAPs) and the City of Tshwane's action plan is expected in 2022. These municipalities are relatively better resourced (have environmental sustainability staff and options to raise income by taxes and levies) and received external support for the preparation of the plans (C40 Cities, no date; Steenkamp et al., 2020). Johannesburg's CAP adaptation themes include water security, resilient human settlements, flood and drought management, resilient infrastructure (municipal and green spaces), and healthy communities (City of Johannesburg, 2021); the CAP forecasts R1.3 billion capital expenditure costs and R650 million operation costs per year for prioritised adaptation actions. The City estimates that it can source 60% of the required finance from existing budget and by applying a climate lens to resilience building and critical basic service provision (City of Johannesburg, 2021).

11 A summary of published climate action plans and their costing estimates can be found in Table 7, annexed to this report.

The City of Cape Town's Climate Action Plan defines six strategic focus areas for adaptation and gives a range of costs of R386 million to more than R2 billion for proposed interventions (according to our calculation using estimates in City of Cape Town, 2021). The strategic focus areas address urban cooling and heat responsiveness, water security and drought readiness, water sensitivity, flood readiness and storm management, coastal management and resilience, fire risk and responsiveness and the spatial and resource inclusivity of its settlements (City of Cape Town, 2021a). The high-cost projects aim to augment Cape Town's water supply to ensure the long-term sustainability of supply and for coastal and sea-defence (both more than R100 million in cost). Whilst the better-resourced metros are able to design such plans, these are still lacking among the bulk of municipalities, despite good anecdotal knowledge of priorities (Figure 6). Their absence needs to be addressed to have the prerequisite framework for accessing adaptation finance.

Figure 5 Adaptation funding priorities identified by 13 municipalities in a national webinar for municipalities on 24 March 2022

Source: authors' own

Chapter five

Discussion

5. Discussion

5.1 Despite efforts to build technical capacity in local governments to access climate finance for adaptation, significant systemic barriers remain

Local governments are currently accessing very little adaptation funding – from international and domestic; public and private sources. What we have found in the South African context is very similar to the well-known challenges: that adaptation finance procedures are cumbersome and often inaccessible to national governments, yet alone local governments, and that limitations in capacity to manage, spend and account for funds at local level under existing mechanisms makes it even harder to access adaptation finance.

Whilst adaptation needs can be articulated through local plans informed by vulnerability assessments, they are rarely costed, which impedes them being financed. Climate adaptation plans include either a broad cost bracket – in the example of the City of Cape Town (City of Cape Town, 2021a) – or aggregate costing – done by the City of Johannesburg (City of Johannesburg, 2021). These are useful to understand the general scale of the planned interventions, but not sufficient for motivating for external funding. Although methodological approaches to defining adaptation costs vary, a common characteristic is that they implicitly include investments that could also be described as development. This commonality emphasises the intrinsic overlap of adaptation and development activities (Omari-Motsumi et al., 2019). However, it also poses challenges when additionality reasoning is required.

The level of access of local governments to adaptation finance (public and private) reflects the strength of their financial management. Local governments with strong financial management performance are testing innovative finance mechanisms, for example green bonds and risk pooling. Accessing the fuller benefit of public and private sources relies on strong public finance management practices. Potential for self-generated revenues relies on good governance through by-laws and partnerships, and on the characteristics of the local economy. Key elements to support cities to develop a robust funding base do exist in the intergovernmental fiscal system. These include that municipalities are enabled to build own revenue streams (taxes and service charges), borrow and engage in land value capture transactions, that they can pledge revenues in the issue of bonds[12] and that the National Treasury mandates good practice municipal accounting standards (White and Wahba 2019).

Targeting support for accessing adaptation finance to underperforming and/or excluded municipalities is essential to avoid reinforcing differential vulnerability and inequality. Even of the small amount received relative to needs, adaptation funding does not reach those who need it most, which entrenches subnational inequalities, especially for highly vulnerably municipalities that have

12 'Pledged revenue' means that revenue generated by the bond investment are used to service the debt costs once the necessary expenses for operation and maintenance have been covered, and before the revenue can be used for other purposes, making the investment a less risky investment for bondholders.

a weak revenue base and thus limited capacity to raise their own funds. International and national funders of adaptation demonstrate a preference for funding municipalities with a track record for climate project delivery. Municipalities with a weak revenue base and no historic finance support are not likely to secure funding in future. In the words of one District Municipal manager, "The less you have, the less you get." (Interview 11). Municipalities that have their finances in order and good audit outcomes attract partnerships and endowments, are able to leverage additional finance, remain more attractive to funders, and are more likely to have access to additional support through city support networks.

The current best option for subnational governments is to mainstream climate into their development plans and use domestic finance to fund their adaptation interventions. Risk abatement is reportedly a positive driver of municipal appetite for adaptation interventions and to fund the incremental adaptation costs of development (Interview 8). While integrating or "mainstreaming" adaptation considerations into local government development policy is encouraged in South Africa, the lack of inclusion of climate change expertise across departments or sectors remains a barrier to this. However, the onus is on the subnational government to ensure that climate risk is considered in their planned projects to avoid a lack of adaptation or even maladaptation.

Even where sub-national capacity exists, international climate finance is set up to preference national institutions. The financial and administrative capacities that have to be proved for accreditation to international climate funds means that subnational government is largely excluded. National Designated Authorities are typically national government departments, and thus they also have to endorse applications for accreditation. In South Africa, SANBI has successfully achieved accreditation with the Adaptation Fund and GCF. SANBI has a pipeline of US$100-120 million (Table 5), but reflecting their own capacity and institutional mandate, their focus is on biodiversity-related adaptation projects, which may inadvertently exclude other adaptation ideas at subnational level. While the DBSA is a local regional institution accredited to the GCF and houses the national Green Fund which can fund mitigation and adaptation, the DBSA does not have a specific focus on adaptation funding; the question arises of whether other international accredited institutions can provide access and effective implementation, or whether there is need for additional domestic accreditation.

Unlocking bottlenecks that limit international climate finance for adaptation implementation in local government may require systemic change in the multilateral climate finance system. Bilateral and GCF Readiness Programme support is helping to build national and subnational capacity to access and implement climate finance, however upstream multilateral climate funding barriers persist nearly eight years after accreditation to the GCF. Choosing domestic delivery channels is necessary to build the expertise to access, manage and implement climate finance. However, local government and other local scale implementers require finance support in smaller amounts than are available from climate funds and they cannot match fiduciary requirements typical of development banks. SANBI's recognition of this reality is reflected in their piloting the Enhanced Direct Access Mechanism to vulnerable communities that would otherwise not be able to access climate finance to build adaptive capacity. SANBI's efforts to bridge the gap between international funders and local implementation are remarkable as an example of building sub-national ownership. SANBI's efforts have meant additional capacity building and hands-on support, but is nevertheless still limited by the institution's own lack of capacity to manage more than the currently pipeline of projects. Some of the barriers to access that SANBI addresses through enhanced direct access are similar to those identified for local governments.

Exploring the use of a similar mechanism for local governments may be warranted – recognising that if it is to be managed by an existing accredited entity, they also require support to be able to manage the process and effectively work to build capacity.

5.2 Building technical capacity to access funding yields some success and needs to be complemented by a range of interventions to build capabilities

Processes to build a pipeline of potential climate change projects (including in the LGCCSP, the GCF pipeline process and TAP, among others that target mitigation) **have revealed good appetite among subnational actors including local government and some sectoral departments like water and sanitation** (Annex B). **However, municipal officials are discouraged by the low likelihood of success and the overly complex process.** Training of municipal staff to access climate finance is successful in building awareness of where and how to look for opportunities to apply for funding among the staff that attend the training – although capacity to use this information is limited by the structural barriers identified above. There remains a shortage of resources (time, staff, expertise) to pursue opportunities and within municipalities there is the perception that funding application processes are slow and cumbersome, with small chances of success. Extensive delays in giving municipalities feedback on ideas for funding proposals may have a negative impact on institutional capacity where there are staff changes in the interim, and on the motivation to apply for funds. Even when municipality officials have experience implementing and administering and reporting international grant funding for adaptation, municipal officials expressed the perception that their municipalities are not equipped to pursue and secure external funding for adaptation.

Further institutional capacity support is required for both national and subnational government entities to improve access climate funds. This support by readiness programmes needs to go beyond short-term technical training, and should be accompanied by a system of long-term, sustainable institutional capacity building, including around financial management. A few key interventions appear to be linked to greater progress in implementing adaptation actions at municipal levels, particularly in large metros. These include having an institutional champion of climate change adaptation, particularly at more senior levels of administration, who can ensure that adaptation concepts are taken forward; and membership of transnational municipal climate change networks. Such networks provide a range of planning and capacity building support to members, including support to access climate finance for some metropolitan municipalities, and membership of multiple networks is associated with higher levels of adaptation planning. However, there is still need for more support for intermediate-sized metropolitan municipalities to benefit from peer learning. Without addressing these underlying factors, adaptation needs at sub-national level will remain unfunded and hence unmet.

5.3 Policy interventions may address significant remaining gaps in funding adaptation

Resourcing the local government adaptation response may be institutionalised by making the allocation of finance for adaptation the responsibility of municipal finance departments. Finance flowing from national to subnational government is not ring-fenced for purpose and expenditure allocation is subject to priorities favoured by senior management in municipalities. Self-generated revenue, for example from bonds can be ring-fenced for specific projects. Climate action plans show evidence of alignment with plans and programmes budgeted and sometimes already underway in other departments. Implementing climate budget tagging will enable monitoring of expenditure against adaptation plans and assessment of which finance sources meet which costs.

Differentiating the size and fiduciary and administrative requirements of finance availability to meet levels of local government capacity to manage and implement, and their level of finance needs would help address some of the shortfall in adaptation finance. Since many of the projects that municipalities would like to fund are too small for the international climate finance sources, more appropriately-sized funds, such as through small(er) grants administered by SANBI under the Adaptation Fund would help fill the gap. These are typically more appropriate for the technical and financial capacity of municipalities that are excluded from access to climate funds, and would help to build the very track record for successful management and delivery that is ultimately essential for eligibility for larger amounts from the bigger funds. SANBI's project proposal pipeline to the GCF includes an Enhanced Direct Access Pilot Programme, using the GCF's Simplified Approval Process (which offers funding up to US$10 million for low-risk projects) to offer a range of modalities at different scales by using the existing systems of established grant makers in South Africa.

Developing a national climate finance strategy could help coordinate adaptation priorities and guide a more strategic aggregate approach to funding. Process to develop this strategy would ideally include stakeholder consultation including local government inputs. Understanding the type of costs that can reasonably be expected to be met by domestic public finance, which are suitable for private sector investment, and what priority finance needs are not met through existing finance flows would be useful informants for developing this strategy. Such improved coordination could facilitate the identification of sectoral gaps in climate finance access and inform a process to identify suitable institutions for possible further accreditation with international climate funds

A decision to seek an additional accredited entity is relevant to operationalising the NCCAS and it has bearing on what role international climate funds might play in reducing the shortfall in funding adaptation. This question is also relevant to South Africa's national climate finance strategy. Further accreditation could help increase the sectoral reach of adaptation finance, but it is a costly and uncertain investment. A strategic national conversation seems needed among relevant policymakers and finance and implementation practitioners, among others in the landscape of actors that need funding to implement the NCCAS. Key questions prompting a discussion could be: "What other existing institutions might be suitable for accreditation for adaptation?" and, "What are possible options to create access?". A process to select a further national entity is likely in itself to prove an important capacity building process for the nominated national institutions. This opportunity is further supported

by the possibility of now accrediting a second national institution to the Adaptation Fund, which has proven a useful gateway to later accrediting to larger funds such as the GCF for SANBI in South Africa and in other developing countries.

Bilateral support plays a significant role in strengthening institutional capacity through funding adaptation projects and supporting SANBI with resources to upscale its efforts. Bilateral support may also be an effective route for project implementation by local governments if it can be sufficiently nimble and adaptive, to address delays associated with bureaucracy whilst maintaining standards for accountability. Local government implementation of ICF such as in the uMgungundlovu District Municipality may offer learnings in this regard.

Chapter six

Conclusion

6. Conclusion

The internationally observed adaptation finance gap is evident in South Africa and particularly evident in the quantities of finance flows to the subnational level. We argue that in the light of the immediacy of finance needs (2020-2030 for initial implementation of the NCCAS) attention needs to be paid to ensuring better availability and accessibility of finance for adaptation – from multiple sources – at subnational level. This is critical as this is the level where the majority of implementation takes place in order to unlock bottlenecks and barriers to finance flows. Hence, without adaptation at this level, South Africa's national adaptation commitments will not be met.

In order to close the gap between adaptation needs and available funding, subnational governments will need to tap an array of financial sources, which is already in evidence in some South African cities and metros. However, even large cities find it hard to access finance for adaptation, despite evidence that investing in adaptation and resilience could avert the vast majority of their forecast economic losses from extreme weather events. Challenges are even greater for the more resource-constrained, smaller municipalities, many of which have high levels of vulnerability to climate change.

Domestic public and private finance for adaptation may be enhanced through conventional and novel mechanisms. Generating municipal revenues for adaptation through taxes, user charges and more novel approaches like land value capture and public-private partnerships may be required to ring-fence finance for adaptation. However, funding adaptation through revenue-generation assumes that local populations are economically active and pay taxes, which is not the case for some municipalities that are most vulnerable to climate change impacts. Large cities with robust financial management practices are best placed to access private finance and make use of public-private partnerships, provided higher levels of trust are built between public and private actors. Institutionalising adaptation cost across local government departments requires good integration of adaptation in service delivery and development activities. Climate champions in senior staff positions play a key role in this. Developing concrete climate action plans and making this a responsibility in public finance departments are two possible ways to do this.

Subnational vulnerability assessments and emerging adaptation plans, together with efforts to build capacity to develop adaptation projects and apply for financing do seem to have translated into the development of some concrete project ideas. Capacity related to accessing climate finance is only one aspect of lack of capacity that most local governments in South Africa face around climate change, particularly outside of large metropolitan municipalities, and these are not necessarily specific to climate change. Despite various efforts to increase the capacity of sub-government entities to access climate finance, city officials report that inadequate technical capacity, insufficient resources (time), an inadequate profile of climate change staff to influence large municipal programmes, and insufficient support and diversity in type of accredited entities has prevented progress applying to climate funds.

Exploring novel mechanisms for the delivery of adaptation funding seems warranted in order to define an institutional route for the delivery of funding to support adaptation goals. South Africa's accredited entity for adaptation to the GCF has planned activities to its full capacity over the next three years, so

enhancing or diversifying delivery channels will be needed to access GCF and AF funding. However, learnings from SANBI's Enhanced Direct Access pilot project seem especially relevant to the need to deliver funding in different scales to meet absorptive capacity, financial performance capability and to target needs at the locally-relevant scale. Increasing the availability of adaptation funding through small granting programmes is important to make available smaller amounts of money than is typical with international adaptation finance, but suits the current fiduciary capacity of municipalities and enables them to develop a track record of effective implementation in the process.

In terms of international climate finance, a strong bias towards mitigation activities suggests that opportunities exist for South Africa to radically enhance funding for adaptation. Despite a strong implementation track record suggested by a high disbursement ratio for adaptation activities funded by international development finance, key national adaptation priorities are ignored by international funders. The false distinction made between development and climate activities in international climate finance policy, together with the need for co-finance, is a constraint. In the example of local governments in South Africa implementing climate action, these requirements compel climate fund applicants to articulate a strong climate rationale to apply for funding for adaptation, and align implementation timing with the integration of most other costs into service delivery and development budgets across departments.

In the domestic context more broadly, given the range of potential options, a national climate finance strategy would have a useful role to direct finance where it is needed, in alignment with national adaptation needs and priorities as outlined in the NCCAS, and the localisation of these through municipal adaptation plans. The first five-year review of the NCCAS is due in 2025, which could inform the development of a costed implementation plan which could link to the national climate finance strategy and serve also as a piece of an implementation plan for the NDC. Together with the forthcoming climate budget tagging, this would enable better tracking of existing adaptation finance and better identification of priority gaps to address.

Chapter seven

References

7. References

Adaptation Fund Board Secretariat. (2010) Accessing resources from the Adaptation Fund: The Handbook. Adaptation Fund.

Amirali, A. (2020) Financing for climate adaptation – an overview of current regimes. Brighton, UK: Institute of Development Studies.

Anessi-Pessina, E., Sicilia, M. & Steccolini, I. (2012) Budgeting and rebudgeting in local governments: siamese twins? Public Adm. Rev. 72(6), 875–884.

Archer, E., Landman, W., Malherbe, J., Tadross, M. & Simone Pretorius. (2019) South Africa's winter rainfall region drought: A region in transition? Clim. Risk Manag. 25. doi:100188

Atteridge, A. (2021) Mapping international financial flows to South Africa in support of climate change action. Input to case study, SNAPFI project. Preprint: https://doi.org/10.6084/m9.figshare.14528910.v1 . Dataset: https://doi.org/10.6084/m9.figshare.14528922.v2. Cape Town: University of Cape Town.

Atteridge, A., Savvidou, G., Sadowski, S., Gortana, F., Meintrup, L. & Dzebo, A. (2019) Aid Atlas. Aid Atlas. Retrieved April 1, 2022, from https//:aid-atlas.org.

Auditor-General of South Africa. (2022) Consolidated general report on local government audit outcomes MFMA 2020-21. Pretoria, South Africa. Retrieved from https://mfma-2021.agsareports.co.za/downloads/agsa-mfma-general-report-2021

C40. (2021) C40 Cities Finance Facility: Developing projects to address climate change in cities.

C40 Cities. (n.d.) C40 South Africa. Retrieved August 5, 2022, from https://www.c40.org/c40-south-africa/

C40 Finance Facility. (2020) Learnings from knowledge exchanges in South Africa's KwaZulu Natal province. Retrieved June 20, 2022, from https://www.c40cff.org/news-and-events/learnings-from-knowledge-exchanges-in-south-africas-kwazulu-natal-province

Carmin, J., Anguelovski, I. & Roberts, D. (2012) Urban climate adaptation in the Global South: Planning in an emerging policy domain. J. Plan. Educ. Res. 32(1), 18–32.

Cassim, A., Radmore, J.-V., Dinham, N. & McCallum, S. (2021) South African climate finance landscape 2020. Cape Town, South Africa: Climate Policy Initiative, GreenCape and Bertha Centre for Social Innovation and Entrepreneurship and Climate Policy Initiative. Retrieved from https://www.green-cape.co.za/assets/South-African-Climate-Finance-Landscape-2020-January-2021.pdf

Chapagain, D., Baarsch, F., Schaeffer, M. & D'haen, S. (2020) Climate change adaptation costs in developing countries: Insights from existing estimates. Clim. Dev. 12(10), 934–942. doi:10.1080/17565529.2020.1711698

Chauke, I. (2022) Profiling of climate change integration in municpal infrastructure [Presentation at Municipal Webinar on 24 March 2022].

Chu, E., Anguelovski, I. & Roberts, D. (2017) Climate adaptation as strategic urbanism: assessing opportunities and uncertainties for equity and inclusive development in cities. Cities (60), 378–387.

City of Cape Town. (2021) City of Cape Town Climate Change Action Plan. Cape Town: City of Cape Town.

City of Cape Town. (2021) Climate Change Action Plan.

City of eThekwini. (2019) Durban Climate Action Plan 2019.

City of Johannesburg. (2021) Climate Action Plan. Johannesburg, South Africa: EISD, City of Johannesburg. Retrieved from https://www.joburg.org.za/departments_/Documents/EISD/City of Johannesburg - Climate Action Plan %28CAP%29.pdf

Climate Bonds Initiative. (2015) Scaling up green bond markets for sustainable development. Climate Bonds Initiative. Retrieved from https://www.climatebonds.net/files/files/GB-Public_Sector_Guide-Final-1A.pdf

Climate Bonds Initiative. (2022) Certification: City of Cape Town. Retrieved August 14, 2022, from https://www.climatebonds.net/2014/06/just-out-first-emerging-market-green-city-bond-city- ohannesburg-green-bond-approx-r15bn

Climate Policy Initiative. (2019) Global landscape of climate finance 2019. [Barbara Buchner, Alex Clark, Angela Falconer, Rob Macquarie, Chavi Meattle, Rowena Tolentino, Cooper Wetherbee]. London, United Kingdom: Climate Policy Initiative. Retrieved from https://climatepolicyinitiative.org/publication/ global-climate-finance-2019/

Climate Policy Initiative. (2021) Global Landscape of Climate Finance 2021.

Colenbrander, S., Dodman, D. & Mitlin, D. (2018) Using climate finance to advance climate justice: the politics and practice of channelling resources to the local level. Clim. policy 18(7), 902-915.

Council for Scientific and Industrial Research. (2021) Nationally Determined Contribution Update: Adaptation Component. Report Prepared for the Department of Environment, Forestry and Fisheries, South Africa. Tshwane. Retrieved from https://www.csir.co.za/sites/default/files/Documents/Adaptation technical report-online.pdf

Department of Environment, Forestry and Fisheries. (2019) The cost estimate for implementation of the National Climate Change Adaptation Strategy. Final Report.

Department of Environmental Affairs. (2015) South Africa's Intended Nationally Determined Contribution (INDC). Department of Environmental Affairs. Retrieved from http://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/South Africa First/South Africa.pdf

Department of Environmental Affairs. (2018) Draft Climate Change Bill. Pretoria, South Africa: Department of Environmental Affairs (South Africa).

Department of Environmental Affairs. (2018) Let's Respond Toolkit. Retrieved January 15, 2022, from https://letsrespondtoolkit.org/resources/downloads/lets-respond-toolkit/

Department of Fisheries, Forestry and the Environment). (2022) Presentation in 'Profiling of climate change integration in municpal infrastructure' Municipal webinar on 24 March 2022. Online.

Department of Planning, Monitoring and Evaluation. (2019) Medium Term Strategic Framework (2019-2024). Tshwane: Department of Planning, Monitoring and Evaluation.

Department of Water and Sanitation, City of Cape Town. (2018) Water outlook 2018 report, revision 24. Cape Town, South Africa: City of Cape Town. Retrieved from https://resource.capetown.gov.za/documentcentre/Documents/City research reports and review/Water Outlook 2018_Rev 30_31 December 2018.pdf

Development Bank of Southern Africa. (2022) Green Fund. Retrieved August 12, 2022, from https://www.dbsa.org/solutions/climate-financing/green-fund

Dougherty-Choux, L. (2015) The costs of climate adaptation, explained in 4 infographics. World Resour. Inst. Washington DC: World Resources Institute. Retrieved from https://www.wri.org/insights/costs-climate-adaptation-explained-4-infographics

Ellis, B. C. & Pillay, K. (2017) Leveraging private sector finance for climate compatible developmen: Lessons from CDKN.

Fankhauser, S. (2009) The costs of adaptation, 19–28. Centre for Climate Change Economics and Policy Working Paper No. 8 and Grantham Research Institute on Climate Change and the Environment Working Paper No. 7.

Garden Routh District Municipality. (2021, April 30) Media Release: Adaptive Capacity Facility Climate Resilient Human Settlements Pilot Programme to be project managed by the GRDM. Retrieved April 27, 2022, from http://www.gardenroute.gov.za/category/garden-route/page/4/

Green Climate Fund. (2021) Funding Proposal: FP181: CRAFT - Catalytic Capital for First Private Investment Fund for Adaptation Technologies in Developing Countries. Green Climate Fund Board. Retrieved from https://www.greenclimate.fund/sites/default/files/document/funding-proposal-fp181.pdf

Green Climate Fund. (2022) Global Subnational Climate Fund (SnCF Global) – Equity. Retrieved August 4, 2022, from https://www.greenclimate.fund/project/fp152

Green Climate Fund. (2022) CRAFT - Catalytic Capital for First Private Investment Fund for Adaptation Technologies in Developing Countries. Retrieved August 4, 2022, from https://www.greenclimate.fund/project/fp181

Green Climate Fund. (2022) The Global Subnational Climate Fund (SnCF GLOBAL). Retrieved from https://www.greenclimate.fund/sites/default/files/document/sncf-case-study.pdf

Heikkinen, M., Karimo, A., Klein, J., Juhola, S. & Ylä-Anttila, T. (2020) Transnational municipal networks and climate change adaptation: A study of 377 cities. J. Clean. Prod. (257), 120474.

ICLEI. (2022) Transformative Actions Program. Retrieved May 6, 2022, from https://tap-potential.org

ICLEI Africa. (2019) A practical systematic guide towards unlocking municipal climate finance. Pretoria, South Africa: Department of Environment, Forestry and Fisheries (DEFF).

ICLEI Africa. (2019) Financing local climate action in South Africa: Introductory training manual.

Junghans, L. & Dorsch, L. (2015) Finding the finance: Financing climate compatible development in cities. Bonn, Germany.

Khan, M. R. & Munira, S. (2021) Climate change adaptation as a global public good: implications for financing. Clim. Change 167(50). doi:10.1007/s10584-021-03195-w

Khan, M., Robinson, S. ann, Weikmans, R., Ciplet, D. & Roberts, J. T. (2019) Twenty-five years of adaptation finance through a climate justice lens. Clim. Change 251–269. doi:10.1007/s10584-019-02563-x

Kopung, S., Meyer, J., Lubbe, S. & Klopper, R. (2016) Operational framework for municipal infrastructure grant spending in the North-West. J. Public Adm. 51(1), 115–135.

Lewis, S., Shakya, C. & Steele, P. (2017) Money where it matters: financing the Sustainable Development Goals and Paris Agreement through local finance. London, United Kingdom.

Mathew, S. & Moore, M. (2011) State incapacity by design: Understanding the Bihar story. IDS Working Paper 366. Vancouver.

Meyer, D. F. & Neethling, J. R. (2021) An assessment of the financial health of the South African metropolitan municipal regions. Forum Sci. Oeconomia 9(4), 59–77. doi:10.23762/FSO_VOL9_NO4_3

Mohanlal, S. (2019) Investigating the feasibility of municipal risk pooling as a climate change adaptation finance measure. October.

National Business Inititaive. (2020) Unlocking Private Sector Involvement in The Green Climate Fund Projects in South Africa: Building an Adaptation Project Pipeline. Retrieved April 20, 2022, from https://www.nbi.org.za/event/unlocking-private-sector-involvement-in-the-green-climate-fund-projects-in-south-africa-phase-2-launch/

National Planning Commission. (2011) National Development Plan 2030. Pretoria, South Africa: Republic of South Africa.

National Treasury. (2022) Budget Review 2021. Pretoria: National Treasury, Republic of South Africa.

National Treasury Department. (2021) 2020/21 National Treasury Annual Report. National Treasury. Retrieved from http://www.treasury.gov.za/publications/annual reports/national treasury/2021 NT Annual Report.pdf

National Treasury Department. (2022) Medium Term Expenditure Framework: |Technical Guidelines. Pretoria, South Africa: National Treasury.

National Treasury Department. (2022) South African Green Finance Taxonomy. First Edition. Pretoria, South Africa: National Treasury.

Ndlovu, M., Clulow, A. D., Savage, M. J., Nhamo, L., Magidi, J. & Mabhaudhi, T. (2021) An Assessment of the Impacts of Climate Variability and Change in KwaZulu-Natal Province, South Africa. Atmosphere (Basel). 12(4), 427.

Nelson Mandela Bay Municipality. (2015) Climate Change and Green Economy Action Plan.

Nicholls, R. J., Wong, P. P., Burkett, V. R., Codignotto, J., Hay, J., McLean, R., Ragoonaden, S., et al. (2007) Coastal systems and low-lying areas, in Parry, ML, Canziani, OF, Palutikof, JP, van der Linden, PJ, and Hanson, CE (ed) Climate change: impacts, adaptation and vulnerability. Contribution of Working Group II to the fourth assessment report of the Internat. Cambridge, UK.

OECD. (2018) Making blended finance work for the Sustainable Development Goals. doi:10.1787/9789264288768-en

Omari-Motsumi, K., Barnett, M. & Schalatek, L. (2019) Background Paper Broken Connections and Systemic Barriers : Overcoming the Challenge of the ' Missing Middle ' in Adaptation Finance.

Parry, M., Arnell, N., Berry, P., Dodman, D., Fankhauser, S., Hope, C., Kovats, S., et al. (2009) Assessing the costs of adaptation to climate change: a review of the UNFCCC and other recent estimates. London, United Kingdom.

Patel, S., Soanes, M., Rahman, F., Smith, B. & Steinbach, D. . (2020) Good climate finance guide: lessons for strengthening devolved climate finance. London, United Kingdom.

Pegasys. (2018) Mainstreaming climate responsiveness into city plans, budgets and grant conditions. Report 3a-Phase 3. Climate mainstreaming in South African Cities: A review of Infrastructure Grant conditions, outputs and outcomes. Executive Summary.

Pegasys. (2018) Climate Mainstreaming in South African Cities: Opportunities for Strengthening Cities' Access to Climate Finance. Report 3b.

Pegasys. (2018) The provision of technical and strategic recommendations to mainstream climate responsiveness into city plans, budgets and grant conditions. Report – Phase 1b. Cities' capital expenditure and alternative financing analysis.

Persson. Å. (2011) Institutionalizing climate adaptation finance under the UNFCCC and beyond: Could an adaptation 'market' emerge? Sweden.

Petrie, B., Wolpe, P., Reddy, Y., Adriázola, P., Gerhard, M., Landesman, T., Strauch, L., et al. (2018) Multi-level climate governance in South Africa. Catalysing finance for local climate action. Berlin / Cape Town: OneWorld, Sustainable Energy Africa, adelphi.

Pillay, K. (2020) Extending coverage to the most vulnerable by integrating risk pooling schemes and microinsurance products.

Pillay, K. & Pillay, S. (2018) Financing climate change adaptation and resilience in South Africa cities. In: SACN, 2018. State of City Finances 2018. Johannesburg, South Africa. Retrieved from https://www.sacities.net/wp-content/uploads/2020/07/State-of-City-Finances-Report-2018.pdf

Premier Sihle Zikalala. (2022) Remarks by KwaZulu-Natal Premier Sihle Zikalala on the occasion of receiving humanitarian aid from the Embassy of Qatar, King Shaka International Airport. Retrieved from https://www.gov.za/speeches/premier-sihle-zikalala-receiving-humanitarian-aid-embassy-qatar-29-may-2022-0000

Reddy, Y., Pather-Elias, S., Keusen, L., Adriázola, P., Wolpe, P., Sithole, M., Nkohla, F., et al. (2021) The local government climate change support programme in South Africa. Real P. Berlin / Cape Town.

Republic of South Africa. (2011) National Climate Change Response White Paper. Pretoria, South Africa: Republic of South Africa.

Republic of South Africa. (2019) National Climate Change Adaptation Strategy. Pretoria, South Africa, Republic of South Arica: Republic of South Arica.

Republic of South Africa. (2020) South Africa's Low Emission Development Strategy 2050. Republic of South Africa.

Republic of South Africa. (2021) South Africa: First Nationally Determine d Contribution under the Paris Agreement, updated September 2021. UNFCCC.

Republic of South Africa. (2021) Proposed updated Nationally Determined Contribution: South Africa's First Nationally Determined Contribution under the Paris Agreement Updated in 2021.

Resch, E., Allan, S., Giles Alvarez, L. & Bisht, H. (2017) Mainstreaming, Accessing and Institutionalising Finance for Climate Change Adaptation. Oxford, United Kingdom: Action on Climate Today.

Savvidou, G., Atteridge, A., Omari-Motsumi, K. & Trisos, C. H. (2021) Quantifying international public finance for climate change adaptation in Africa. Clim. Policy 21(8), 1020–1036. Taylor and Francis Ltd. doi:10.1080/14693062.2021.1978053

Schaeffer, M., Balo, G., Melkie, M. E., Fallasch, F., Calland, R., Hare, B., Marez, L. D., et al. (2015) Africa's adaptation gap 2: bridging the gap: mobilising sources. Vancouver, Canada.

Shakya, C., Soanes, M. & Smith, B. (2019) Calling business unusual: reforming climate finance. London, United Kingdom. Retrieved from https://pubs.iied.org/17736IIED/

Simpson, N. P., Simpson, K. J., Shearing, C. D. & Cirolia, L. R. (2019) Municipal finance and resilience lessons for urban infrastructure management: a case study from the Cape Town drought. Int. J. Urban Sustain. Dev. 11(3), 257–276. doi:10.1080/19463138.2019.1642203

Soanes, M., Bahadur, A., Shakya, C., Smith, B., Patel, S., Rumbaitis, C., Rio, D., et al. (2021) Principles for locally led adaptation: A call to action. Retrieved from http://www.icccad.net/our-team/saleemul-huq/

Soanes, M., Shakya, C., Barrett, S., Steinbach, D., Nisi, N., Smith, B. & Murdoch, J. (2021) Follow the money Tracking Least Developed Countries 'adaptation finance to the local level. London, United Kingdom: IIED.

Somorin, O., Nduhiu, M. & Ochieng, R. (2021) Financing Adaptation in Africa: The Key to Sustainable Development? South African Inst. Int. Aff. Retrieved from https://www.jstor.org/stable/resrep37458

South African Cities Network. (2018) State of City Finances Report 2018. Johannesburg. Retrieved from http://eolstoragewe.blob.core.windows.net/wm-566841-cmsimages/WEB_SACNSoCFIV.pdf

South African Cities Network. (2020) State of City Finances Report 2020. Johannesburg: South African Cities Network. Retrieved from https://www.sacities.net/wp-content/uploads/2021/06/WEB_SACN-SOCF-V-2020-v2_144dpi.pdf

South African Local Government Association. (2022) Presentation at Municipal Webinar on integration of climate in municipal infrastructure and planning, and climate finance on 24 March 2022, online.

South African National Biodiversity Institute. (2018) Project Proposal to the Adaptation Fund: Building Resilience in the Greater uMngeni Catchment. SANBI. Retrieved from https://www.sanbi.org/wp-content/uploads/2018/03/sa-nie-umngeni-resilience-projectfull-project-proposalapproved-oct-14-2.pdf

South African National Biodiversity Institute. (2021) SANBI's Green Climate Fund project development processes. Clim. funds Green Clim. Fund.

South African National Biodiversity Institute. (2021) A blueprint for Enhanced Direct Access in South Africa. Draft document November 2021. Cape Town, South Africa: South African National Biodiversity Institute.

StatsSA. (2019) How financially independent are municpalities? Econ. Growth. Retrieved August 18, 2022, from https://www.statssa.gov.za/?p=12033

Steenkamp, M., Steyn, N. & Anthony, B. (2020) Case Study Compendium: Local climate change action in 10 South African cities.

Susskind, L. & Kim, A. (2021) Building local capacity to adapt to climate change. Clim. Policy 1–14 . doi:10.1080/14693062.2021.1874860

Tänzler, D., Cochu, A. & Agster, R. (2017) Challenges and Opportunities for Urban Climate Finance-Lessons Learned from eThekwini, Santiago de Chile and Chennai: cities fit for climate change.

The Lab. (2020) Climate Adaptation Notes. Glob. Innov. Lab Clim. Financ. | Driv. Sustain. Dev. The Global Innovation Lab for Climate Finance | Driving Sustainable Development. Retrieved from https://www.climatefinancelab.org/project/climate-adaptation-notes/

Tshindane, M. (2021, April 9) Update on Unlocking Private Sector Involvement for South Africa's Green Climate Fund Project Development. Department of Forestry, Fisheries and the Environment, SANBI. Retrieved from https://www.sanbi.org/wp-content/uploads/2022/01/May-2021.pdf

UNEP. (2016) Adaptation Finance Gap Report. Nairobi, Kenya.

UNFCCC Secretariat. (2020) Opportunities and options for adaptation finance, including the private sector. UNFCCC secretariat.

UNFCCC Standing Committee on Finance. (2021) First report on the determination of the needs of developing country Parties related to the implementing the Convention and the Paris Agreement.

Wall, K., Watermeyer, R. & Pirie, G. (2012) 'Wagging the dog': How service delivery can lose its way in the procurement maze — and could find it again. In: Institution of Municipal Engineering of Southern Africa Conference, George, South Africa, 3 September 2012. Retrieved from https://researchspace.csir.co.za/dspace/bitstream/handle/10204/6687/Wall7_2012.pdf?sequence=3&isAllowed=y

Whiley, A. (2017) Green City Bonds: Opportunities for cities to fund climate-resilient infrastructure. Blogpost 6 October 2017. in SACN (2018) State of City Finances Report 2018. Johannesburg. Available at: http://eolstoragewe.blob.core.windows.net/wm-566841-cmsimages/WEB_. Retrieved from https://www.climatebonds.net/2017/10/green-city-bonds-opportunities- cities-fund-climate-resilient-infrastructu

White, R. & Wahba, S. (2019) Addressing constraints to private fincing of urban (climate) infrastructure in developing countries. Int. J. Urban Sustain. Dev. 11(3), 245–256.

Winkler, H., Keen, S. & Marquard, A. (2021) Policy approaches to guide finance flows for more effective climate action in South Africa.

World Weather Attribution. (2018) Likelihood of Cape Town water crisis tripled by climate change. Retrieved from https://www.worldweatherattribution.org/the-role-of-climate-change-in-the-2015-2017-drought-in-the-western-cape-of-south-africa/

Ziervogel, G., Enqvist, J., Metelerkamp, L. & Breda, J. van. (2021) Supporting transformative climate adaptation: community-level capacity building and knowledge co-creation in South Africa. Clim. Policy 1–16.

Chapter eight

Annex A:

Support programmes for adaptation and adaptation finance

8. Annex A: Support programmes for adaptation and adaptation finance

A.1. The Local Government Climate Change Support Programme (LGCCSP)

National government's training of municipality officials to conceptualise and package climate project proposals ready for funding is funded under the Local Government Climate Change Support Programme (LGCCSP). LGCCSP is led by the Department of Forestry, Fisheries and Environment (DFFE) with funding from the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) and technical support from the South African Local Government Association (SALGA) (Reddy et al., 2021).

The LGCCSP has produced a toolkit and guidance documents; the "Let's Respond Toolkit" developed in the programme's pilot phase in 2012, aims to integrate climate change risks into municipal planning processes (Department of Environmental Affairs, 2018b). Launched in 2014, early phases of LGCCSP assisted all district and some local municipalities to conduct vulnerability assessments, identify emissions sources and develop climate change response plans. Since 2018, LGCCSP focused on providing support to local government in preparing climate change project proposals and produced a training manual used in three-day trainings for municipal staff (ICLEI Africa, 2019a). The manual guides conceptualisation and costing of climate change adaptation, mitigation and the green economy theme project proposals. The training targeted officials in intermediary city municipalities, as well as small and rural municipalities, first in municipalities in Limpopo, Mpumalanga, North West, Gauteng and Western Cape provinces, and since 2021 in municipalities in Eastern Cape, Free State, KwaZulu-Natal and Northern Cape (Interview 9).

The training manual encourages municipalities to look to own budget first – conditional grants such as Municipal Infrastructure Grants (MIGs) and other "own revenue" income streams such as taxes and surcharges – and afterwards to a range of sources of finance including international climate finance and private sector finance (ICLEI Africa, 2019a). Outside of finance departments, municipal officials have low levels of awareness of intergovernmental sources of finance such as conditional grants and the system to access such grants, likely due to a lack of communication between line departments (Interview 3).

The training programme led participant in a process of developing example project ideas or "pre-concept notes". These project ideas, rather than necessarily being based on local government climate change vulnerability priorities, appeared to be influenced by the examples given in the training and the sectoral service delivery responsibilities of staff in attendance (Interview 3). Additional support was given to three municipalities to develop the pre-concept notes into full project proposals taken forward by DFFE to support for funding (Interview 9). Some municipalities would require support after the workshop to finalise their pre-concept ideas (Interview 9). In theory, ongoing support is available to from national government through the DFFE's Adaptation Department to develop full concept notes and proposals and looking out for appropriate calls for proposals; in practice the DFFE has itself limited capacity to mentor proposal developers and the offer does not appear to be utilised (Interview 3).

The small number fully developed pre-proposals and proposals indicates a need for further project development support to municipalities after trainings (Interview 3), and the absence of submission of adaptation proposals from the LGCCSP to funders suggests that awareness of funding sources is only one of multiple barriers to accessing finance. Maintaining technical capacity and institutional memory in local government emerged as a challenge – knowledge and use of the municipal vulnerability assessments and climate change response plans varied (Interview 3) – highlighting need for sustained and predictable resources to support this. The training was available to only one or two staff members from each municipality on a once-off basis, meaning that the full range of relevant sectors were not represented.

A.2 City networks' support for climate finance access

City networks for collaboration and peer learning have a good track record for fostering support and implementation (Colenbrander et al., 2018). Members of transnational municipal climate change networks are more likely to have started the adaptation process, while membership of multiple networks is associated with higher levels of adaptation planning (Heikkinen et al., 2020). Memberships with organisations like C40, ICLEI, the Global Covenant of Mayors (GCoM) for Climate and Energy, and the 100 Resilient Cities programme inform climate change action planning (Steenkamp et al., 2020) and build capacity for reporting on climate activities. The networks can be mutually supporting, for example ICLEI Africa seconded staff to work on indicators for the global "Cities Race to Resilience"[13] which is an initiative of the GCoM and aims to strengthen the resilience of at a global level.

Some of these networks provide support member cities to access to climate finance, including to some of South Africa's metropolitan municipalities. However, such initiatives typically target the largest municipalities; there is still need for more support to intermediate-sized metropolitan municipalities, and for more opportunities for small cities and large towns to benefit from peer learning (Interview 8).

The ICLEI – Local Governments for Sustainability network's Transformative Actions Programme (TAP)[14] aims to support local and regional governments to transform their low emission and resilient infrastructure concepts into bankable projects for financing and implementation. TAP aims to address a shortage of bankable projects, by highlighting climate infrastructure projects, linking them to potential investors and project preparation facilities and supporting project preparation, selecting projects through annual global calls. Trainings under the TAP are short, comprising two-day online trainings, which may be too short for participants to get to grips with the number of funds available (Interview 4). Within TAP, South African cities appear to have understood and taken more advantage of the available opportunities than ICLEI Africa members from other countries (ibid), and report being supported to take advantage of innovative steps in their climate change response (KwaDukuza 2020).

However, a prevailing problem is that the projects put forward by smaller municipalities are of too small a ticket size, and ICLEI is trying to address this by pooling projects from the smaller metropolitan municipalities. By April 2022, of more than 300 projects submitted globally to TAP, five from Africa – all

13 https://citiesracetoresilience.org/
14 https://iclei.org/en/TAP.html

energy or waste focused – have successfully accessed finance or been implemented, of which one is from South Africa from the City of Tshwane, with a focus on renewable energy and food security[15].

The C40 network aims to halve the emissions of its member cities by 2030 and offers its members policy support and technical assistance for mitigation and adaptation. South African member cities include Cape Town, Durban, Johannesburg and Tshwane. C40's Cities Climate Action Planning program supports the preparation of bankable climate projects, develops the financial capacities of city administrations and initiates partnerships between cities and prospective financiers (including climate funds). The Climate Action Planning program in the African region is funded by the International Climate Initiative (IKI) and German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), the Danish Ministry of Foreign Affairs (DMFA), the Cities Alliance, and Children's Investment Fund Foundation and provides expert technical assistance and capacity building and an embedded "city advisor" to provide coordinating capacity in each participating city (Interview 4).

The C40 Climate Finance Facility (CFF) provides cities with technical assistance and support to develop and source funding for climate change infrastructure projects, with a focus on both mitigation and resilience (C40, 2021). The technical assistance includes project preparation, capacity development on mobilising and accessing financing instruments, knowledge-sharing and partnerships between cities, practitioners, financiers and policymakers. The CFF embeds local support by funding climate action policy advisors in cities for a period of one to four years to act as climate champions and take ownership of projects (Interview 6). This model has had some success, but has been used to develop policy documents rather than for project implementation as intended, for example the City of Durban used the CFF support CFF to develop a Transformative River Management Programme (TRMP) to address the issues of water quality, climate change and flooding (C40, 2021).

The South African Cities Network (SACN) is a national network established in 2002 aimed at encouraging the exchange of information, experience and best practices on urban development and city management. The network includes the largest eight (of a total of nine) metropolitan municipalities. The SACN includes a sustainable and resilient cities programme, with a focus area on climate change and the current and anticipated impacts of climate change experienced by cities. The SACN encourages cities to respond to climate change, including through peer learning and information sharing. The SACN reports on the state of finance for municipalities, including in relation to funding climate change.

A.3 SANBI's GCF pipeline development capacity support

SANBI, South Africa's national Accredited Entity to the GCF for adaptation, is currently building a pipeline of project proposals for submission to the GCF in the next 3-year period. SANBI was accredited to the GCF in 2016 as a Direct Access Entity for managing grant funding for micro and small adaptation projects (up to US$50 million) in South Africa (South African National Biodiversity Institute, 2021a). As the sole AE for adaptation, SANBI's pipeline development process supports the drafting of proposals from a range of institutions. SANBI sourced bilateral funding support from the Government of Flanders

15 https://tap-potential.org/tap-projects/#tapped-prj

to employ additional staff and technical specialists to support their GCF pipeline project development and implementation process (Interview 7) to overcome institutional capacity barriers.

In 2018 SANBI issued a national call for Expressions of Interest (EoIs) and from this call has submitted three concept notes to the GCF to date. The initial call elicited 126 responses, of which two fully met SANBI's requirements to develop into full proposals; 64 EoIs partially met SANBI's criteria and 60 were unsuitable (Interview 7).

SANBI, in consultation with the DFFE, further reviewed the 64 EoIs that partially met the requirements and selected 11 for further refinement and consultation with the relevant sector departments. The reformulation of these 11 concepts, along with the initial two selected, resulted in 6 project proposals in SANBI's GCF pipeline (Table 5). A proposal to scale up a previous small granting pilot project funded under the Adaptation Fund adds a seventh project (ibid).

SANBI's pipeline development process entailed extensive reworking of initial concepts; one EoI idea was split into two concepts, other concepts now include elements from various originally submitted EoIs. SANBI intends to continue sifting through the project ideas submitted and consulting with the relevant sector departments to see if other elements can be included in some of the current pipeline projects (Interview 7).

Of SANBI's pipeline, three proposal may prove directly important for locally led adaptation: One is a pilot for district municipalities' adopting ecosystem based adaptation (EbA) practices to manage disaster risks in regions vulnerable to climate change hazards, a second focuses on coastal EbA and ecological infrastructure restoration, and the third scales up SANBI's small granting facility (the "Enhancing South Africa's Community Adaptation Small Grants Facility" project, also known as the SGF) and aims to increase the agency of local actors (South African National Biodiversity Institute, 2021b). As part of the learning process for SGF, SANBI developed a "Blueprint for Enhanced Direct Access in South Africa", which outlines the framework for the establishment of a new "Locally Led Adaptation (LLA) Grant Facility (South African National Biodiversity Institute, 2021b).

Work on SANBI's current project pipeline will take them until at least 2023-2024 with an anticipated intense workplan, and they will not have the capacity to consider any other proposals during that period and until further funding is available through the administration of projects under implementation (Interview 7). The current multilateral climate funding mechanisms mean that while assistance is available to national entities for project development, this is only available in the form of consulting fees, and not staff time to manage or conduct this work. Hence the bilateral funding support from the Government of Flanders to employ an additional staff to manage this process and provide technical support has proven essential.

Chapter nine

Annex B:

What adaptation needs are identified in adaptation funding proposals?

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The NCCAS identifies nine strategic interventions, of which municipal government has an implementation role to play within the first four: i.) to reduce human and economic vulnerability, ensure resilience of physical capital and ecological infrastructure and build adaptive capacity (through ten of the priority activities); ii.) develop a municipal early warning system for vulnerable geographic areas; iii.) apply the national adaptation, vulnerability and resilience frameworks to guide local assessments; and iv.) integrate adaptation considerations in development planning and public infrastructure.

B.1 Needs expressed in SANBI's pipeline of project proposals for the GCF

SANBI's pipeline of seven project proposals and concepts for the GCF are adaptation priorities with sufficient scale of finance and impact to be considered for submission to this fund. The list is not exhaustive in terms of priority needs; it is indicative of where domestic networks are being strengthened for implementation. SANBI's GCF pipeline includes projects to strengthen water security, protect and restore coasts, mitigate hazards for vulnerable communities, and build resilience for smallholder farmers, poor rural communities, and poor communities negatively affected by decarbonising the electricity sector. The project's leads include national and provincial government departments; one project partners with target municipalities, one with a university as delivery partner, and the project that scales up SANBI's SGF project is led by civil society organisations (CSOs). The pipeline is valued at US$100 to 120 million (Interview 7); this is a significant increase from SANBI's initial managed climate funding of US$10 million under the Adaptation Fund.

The target foci of SANBI's GCF pipeline are: EbA and ecological infrastructure strengthening approaches to disaster risk management, water security and coasts (projects 1, 3, 4, 5), and vulnerable rural and smallholder communities and communities affected by SA's energy transition. The sectoral foci are environment, water and human settlements (rural and small). SANBI's core mandate relating to biodiversity does not include: urban settlements and especially vulnerable informal communities, economic sectors including agriculture (commercial), hard infrastructure: basic services and transport. Funding for loss and damage from the GCF should be accessed as part of project proposals for adaptation funding, however loss and damage is outside if SANBI's expertise and there is not another entity in South Africa with the required accreditation.

B.2 Needs expressed by municipalities in climate action plans and funding proposals

Municipal climate action plans are a useful entry point to understand climate response priorities (especially for adaptation) and initial estimates of costs (where available). Three metro's – the Cities of eThekwini, Johannesburg and Cape Town – have produce climate action plans, and the City of Tshwane's action plan (with metrics) is expected in 2022. These municipalities are relatively better resourced (have environmental sustainability staff and options to raise income by taxes and levies) and received external support for the preparation of the plans.

We consulted ten municipal officials that had been involved in applying for adaptation funding; the activities included in their proposals were for planning and visioning (in four proposals) and training and skills development (in one), for infrastructure and assets (four) and behaviour and communications (one). Despite having experience implementing and administering and reporting international grant monies for adaptation, their perception was that their municipality is not equipped to pursue and secure external funding for adaptation. The priority themes identified were water supply and sanitation, transport (including roads), energy efficiency, stormwater management, biodiversity and ecosystems, waste management, disaster risk reduction, and heat island effects. Prioritised activities were vulnerability assessments and people involvement.

B.3 Needs expressed in proposals submitted to ICLEI's Transformative Actions Program

Of the seven project proposals submissions accepted from local governments in South Africa to the TAP (ICLEI, 2022), five are adaptation proposals and describe interventions to channel extreme event rainfall and store water for urban agriculture, to restore ecological function and biodiversity of wetlands, riverine environment and areas of high biodiversity, and to beneficiate biomass through control of invasive alien plants. One proposal targets dual benefits by reducing energy and water consumption municipal buildings. The one successful (financed and implemented) proposal established a demonstration livestock farm with a solar power plant and biogas production using the livestock' organic waste. Two of the seven proposals will have direct disaster risk benefits and two provide direct livelihood opportunities for poor.

Table 7 Analysis of adaptation needs and their themes and costs where available in SANBI's GCF proposal pipeline, through ICLEI's Transformative Action Programme and in city climate action plans

	SANBI's GCF pipeline of proposals	ICLEI's Transformation Action Programme	City of Cape Town Climate Action Plan	City of eThekwini Climate Action Plan	City of Johannesburg Climate Action Plan	Nelson Mandela Bay Municipality Climate Change and Green Economy Action Plan
Water security and sanitation	Ecosystem based adaptation for water security Strategic water areas (11) US$20 -30 million Ecological Infrastructure: aquifer recharge Water insecure provinces (2) US$to be determined	Reduce (energy and) water consumption in 20% by 2030 (municipal buildings). KwaDukuza Formalize value chains to beneficiate biomass from invasive alien plants (IAP). Overberg – Restore ecological infrastructure to enhance water security in the Overberg region	Reduce demand for water to protect water resources and ensure sustainability of supply R10 - R100 million Work to augment and increase water supplies to achieve 99.5% assurance of supply R110+ million	Alternative water supply Reduce water demand Improve the quality of effluent Protect infrastructure at risk from flooding Support ecological infrastructure that protects against climate change impacts Implement a transformative urban riverine corridor management program	Water conservation and demand management Establish recycled water schemes Decentralised water supply systems Water-sensitive urban design Water pollution monitoring and management programme	Water augmentation R580 million over 4 years Water conservation: Regulation R15 million over 3 years Water conservation: Rainwater harvesting R243 million over 10 years Water Demand Management
Flood risk		Rehabilitate and restore ecological infrastructure and improve climate and risk resilience. KwaDukuza – River Health Programme Wetlands mapping, restoration and future preservation measures. iLembe District – Wetlands Restoration Project	Proactively reduce flood risk through the implementation of a water-sensitive city strategy or plan R20 - R200 million Take action to reduce flooding and storm damage through disaster mitigation approaches R10 - R100 million	Vulnerable communities: Informal settlements made climate resilient Transition all previously disadvantaged communities towards climate resilience Integrate and align disaster management with climate change resilience	Flood response and resilience: Flood response and improved resilience programme Drought response and improved resilience programme	Improved stormwater and roads infrastructure R4 800 million over 20 years Relocation of Infrastructure & Communities R252 million over 30
Health			Reduce immediate risks to health during heatwaves and high-heat days R20 - R200 million Proactively reduce heat impacts on the city through urban greening R20 - R200 million	Heat mitigation measures to maintain urban heat levels at average 2005-2015 Achieve WHO standards for air quality Achieve a 100% reduction in water and vector- borne diseases linked to climate change impacts	Protection from heat-related health effects Optimal air quality under a changing climate Disease prevention: Increasing resilience against disease	
Food and agriculture	Vulnerable smallholder farmers Kwa-Zulu Natal, Eastern Cape, Mpumalanga and Limpopo US$10 million (GCF Simplified Approval Process)	Support urban agriculture: Restructure infrastructure to channel extreme event rainfall, storing water for dry periods. Ekurhuleni – Community Driven Urban Agriculture		Achieve a 50% increase in locally produced food Reduce the volume of good quality leftover food waste by 80%	Sustainable agriculture programme Green spaces, biodiversity and buildings: Expansion of green spaces and habitat restoration	Agriculture revitalisation R40 million for 3 years Catchment restoration R50 million for 10 years Urban open space management R90 million for 10 years
Coast protection	Coastal EbA/Ecological Infrastructure Coastal provinces & metro's US$to be determined		Promote coastal resilience R220+ million Put in place effective cooperative, empowering mechanisms to address complex coastal management issues related to climate change <R10 million	Establish protection measures, where possible, for existing and new at-risk coastal development and infrastructure		Coastal management R100 million over 50 years

Disaster risk	Ecosystem based adaptation to manage disaster risks District municipalities (7) in regions vulnerable to flood, fire, drought US$20-30 million		Proactively reduce fire risk and the impact of fires on communities and natural areas R30-R300 million		Disaster risk reduction and recovery: Early warning systems (floods, droughts, storms, heatwaves, disease)	Disaster Risk Management
Infrastructure		Restore ecological function & biodiversity: large scale erosion control, invasive alien species control, restore degraded areas to reconnect fragments into viable landscape units. Cape Town – Restoration of ecological resilience and biodiversity in the Cape Floristic Region Global Biodiversity Hotspot			Municipal infrastructure: Infrastructure protection	Green Buildings and Infrastructure R5 million over 2 years (Decentralised) renewable energy R350 million
Transport			Densify mass transit routes through mixed-use developments that supports public transport and include social housing R20 -R10 million			Public transportation system R3 600 million over 10 years
Vulnerable livelihoods	Enhancing South Africa's Community Adaptation Small Grants Facility (upscaling AF SGF) Vulnerable rural communities US$to be determined Just Transition project in Mpumalanga that focusses on vulnerable communities affected by SA's energy transition Coal region US$to be determined					
Capital cost	R100 – 120 million	costs not published	R460 million - R1.44 billion	costs not published	R1.96 billion 2021-2050, of which 60% can be sourced from own budget	R1,9125 billion capital cost