PEAK Urban

LOCAL EVIDENCE
SYNTHESIS REPORT

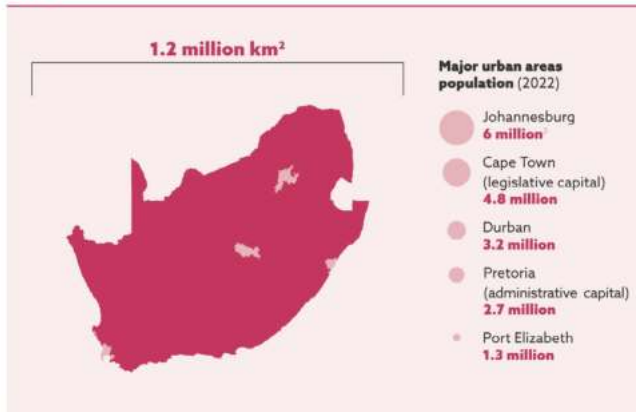## Africa's Urban Boom: Harnessing The Potential

With the right development approaches, African cities can become hubs that relieve poverty and drive regional growth.

PEAK Urban investigates the proactive policies and interventions that can produce efficient, productive, inclusive and sustainable urban futures.
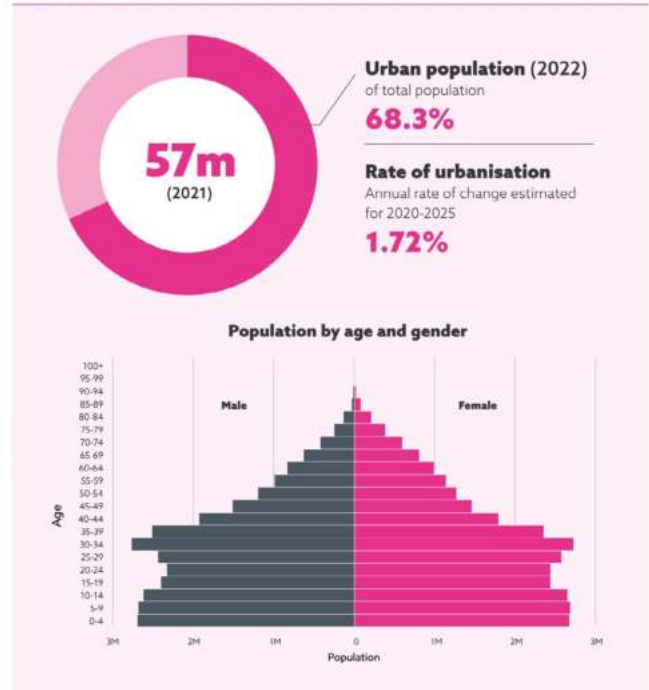
The research was guided by the PEAK Urban approach to urban inquiry and action, shaped by four key pillars:

P **Prediction** – what new approaches can we take to accurately forecast cities' futures?

E **Emergence** – What types of urban structures and systems are emerging?

A **Adoption** – How do cities adopt new ideas and technologies?

K **Knowledge** – How, and with whom, can we best share knowledge globally?
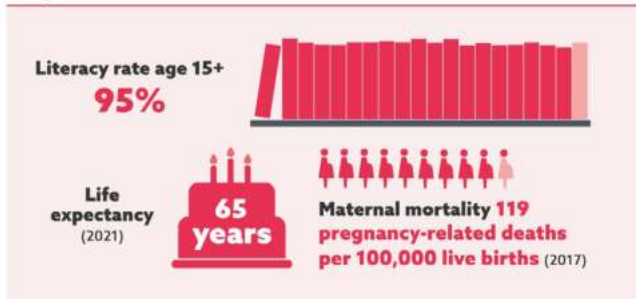
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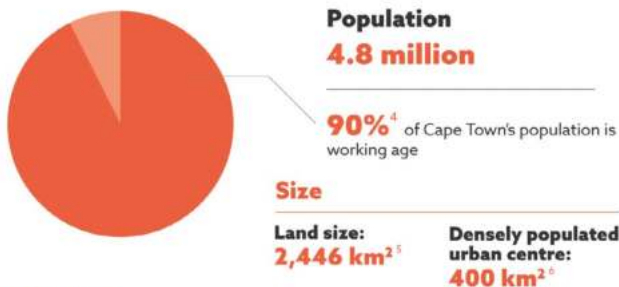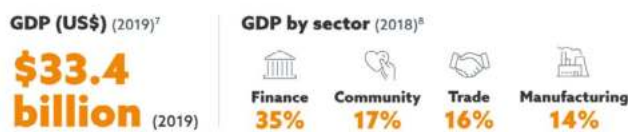SYNTHESIS REPORT

Area

1.2 million km²

Major urban areas population (2022)

Johannesburg
6 million

Cape Town
(legislative capital)
4.8 million

Durban
3.2 million

Pretoria
(administrative capital)
2.7 million

Port Elizabeth
1.3 million

People

Literacy rate age 15+
95%

Life expectancy (2021)
65 years

Maternal mortality 119 pregnancy-related deaths per 100,000 live births (2017)

Economy

Nominal GDP

$680 billion (2020)

Per capita GDP **$11,500** (2020)

Population

57m (2021)

Urban population (2022)
of total population
68.3%

Rate of urbanisation
Annual rate of change estimated for 2020-2025
1.72%

Population by age and gender

Male   Female

Age: 100+, 95-99, 90-94, 85-89, 80-84, 75-79, 70-74, 65-69, 60-64, 55-59, 50-54, 45-49, 40-44, 35-39, 30-34, 25-29, 20-24, 15-19, 10-14, 5-9, 0-4

Population: 3M 2M 1M 0 1M 2M 3M

Equality

Gini Index coefficient
Gini coefficient of 0 = perfect equality
63 (2014)

0   20   40   60   80   100

Annual household (disposable) income
$2,258

Lowest 10% households consume **1.2%**

Highest 10% households consume **51.3%** (2011)

Cape Town (Legislative capital)

Population
4.8 million

90%[4] of Cape Town's population is working age

Size

Land size: 2,446 km²[5]

Densely populated urban centre: 400 km²[6]

Economy

GDP (US$) (2019)[7]
$33.4 billion (2019)

GDP by sector (2018)[8]

Finance **35%**   Community **17%**   Trade **16%**   Manufacturing **14%**

Transit passengers (2019)[15]

Rail **129,000 trips per day**   Bus and tram **250,000 trips per day**

City Life

Population density
1,840 people per km²[9]

Flush toilet and sewerage
88.2%[13]

Weekly refuse removal
94.3%[14]

Natural green space
1,350 hectares[10]

Green space (per person)
289m²[11]

Average annual concentration of particulate matter
13.4 micrograms per m³[12]

Healthcare[16]

Medical practitioners (2020)
47.6 per 100,000 people

Hospital beds (2020)
20.4 per 100,000 people

Leading causes of death (2011)[17]

6.7% Diabetes
6.6% Tuberculosis
6% Heart disease
5.7% HIV
5.4% Cerebrovascular disease

See Footnotes on pg 6

Executive Summary

As cities take on an unprecedented and newly recognised role as drivers of sustainable development, findings from PEAK Urban research in Africa suggest clear principles to support optimum urban management. The PEAK approach offers an important new method to help urban actors **Predict** and project aspects of city life, understand the interaction of **Emerging** systems, consider **Adoption** of appropriate technology and interventions, and facilitate **Knowledge** exchange to support urban inquiry and action (see Box 1).

Based on research from four regional hubs – in China, Colombia, India and South Africa – the PEAK approach yields valuable insights that can inform more effective urban policymaking in highly diverse contexts worldwide.

One of four regional reports, this paper presents key findings from PEAK research based in South Africa, as the focal country for regional development. Centred on Cape Town, the research covers four broad categories – health and wellbeing, governance, housing and finance. It offers insights to help government and non-state actors at city, national and international levels address some of the most pressing developmental challenges in the urban global South, and shape stable, equitable cities that deliver decent lives for all residents:

• **A city is an overarching system of interactions between individual systems**

Cities are the complex product of many interactions between systems – an overarching "system of systems". PEAK research shows that they can be best governed by understanding how these interactions shape emerging urban forms, in order to predict cities' needs, adopt the right solutions and technologies, and create knowledge to share, combine and feed back into the system of systems.

• **Policy should respond to cities' dynamism and embrace informality**

PEAK research reveals the way cities emerge, understanding this as a dynamic, ongoing, multi-layered process, in which the driving forces behind urbanisation change and new technologies shape urban life. Interactions between these dynamic factors mean the futures of cities will always be open and uncertain. This calls for a transition in urban planning philosophy, from rigid regulation and top-down management, to flexible guidance and participatory coordination. PEAK's African research in areas including housing, transport, food supplies and financial remittances illustrates urban informality as a cross-cutting and enduring feature of emerging cities in the global South. Policy should embrace the opportunities inherent in the ways cities emerge, rather than seek to formalise the informal.

• **Effective prediction is based on understanding**

PEAK research in South Africa reveals emerging urban patterns and suggests how this understanding can inform the detailed prediction most useful to urban planning. When planners understand the mechanisms underlying cities' emerging characteristics – such as the impact of Covid-19 on migration – they can choose the right angles to analyse data, predict future trends and shape policy, allowing governments to manage processes of change. Maintaining understanding requires ongoing reinvestigation, as African society is changing dramatically, transforming urban drivers such as informal settlements.

• **A wide lens offers the most effective solutions**

Research across the PEAK African portfolio repeatedly shows the need to adopt urban planning approaches that draw on knowledge from different sectors and systems, and apply joint solutions in each. No aspect of sustainable urban development can be successfully planned in isolation from other aspects. Urban health, for example, depends on psychological and social factors affecting how people engage with the built environment.

• **Context-specific approaches maximise impact at all levels**

PEAK findings in South Africa highlight that urban policies need tailoring if they are to best support each city. This requires national urban strategies to accommodate governance that cuts across spheres in multi-level, decentralised cities. PEAK's research into South Africa's national Cities Support Programme illustrates how collaboration between different spheres of government can improve cities' capacity, while analysis of Cape Town's localisation of the UN Sustainable Development Goals (SDGs) identified specific requirements to integrate city strategies with international targets. Each city needs a bespoke approach to best meet national and international urban development goals.

• Knowledge exchange feeds sustainable nnovations

Spotting the links between sectors and creating knowledge to nurture the "system of systems" is vital for effective urban management. In South Africa, knowledge on informal food production can support health planning, for example, while legislation on workplace diversity affects children's education. At regional and global levels, greater knowledge exchange between cities is also highly valuable for national governments and global policymakers, to promote equitable, sustainable urban development.

As urbanisation expands and cities become increasingly critical to our planet's future, PEAK's collaborative approach gives policymakers a more powerful lens through which to see the interactions that generate new urban characteristics. It also provides new tools to optimise urbanisation processes, helping cities deliver their explicit role in achieving the SDGs.

Image credit: Adobe Stock

By creating interconnected networks of knowledge and action, these policy approaches can deliver cities that are environmentally, economically, institutionally and socially sustainable, and inclusive of all their people.

PEAK's collaborative approach gives policymakers a more powerful lens to see the interactions that generate new urban characteristics.

Image credit: Adobe Stock

Introduction

African cities present vital opportunities for positive development in a fast-changing world. They are at the epicentre of rapid global change, with 95 per cent of all urban growth in the next four decades taking place in Africa and Asia.[1] Within this context, South African cities are a focal point for regional development, with potential to drive economic growth and address poverty and inequality. However, realising this potential requires proactive policies and interventions to produce efficient, productive, inclusive and sustainable urban societies.[2]

South African cities: the engine room of the regional economy

South Africa has seen rapid urbanisation in recent decades, particularly since 1994, as post-apartheid reforms lifted the controls that had previously restricted how people moved and where they could live or work.[3] Today, according to the United Nations Development Programme, 66 per cent of South Africans live in towns and cities, a figure expected to grow to 80 per cent by mid-century.

The forces driving global urbanisation are also behind the rural-urban flow in South Africa. People move to cities in search of better social and material opportunities, job prospects and access to amenities such as housing, electricity, education and healthcare. This urban growth makes cities the engine rooms not just of their own local economies, but also of linked rural areas.

South Africa's colonial and apartheid history, and subsequent post-apartheid nation-building efforts, are stamped into the country's urban form. Its cities are among the most inequitable in the world, characterised by formal and informal neighbourhoods and networks for accessing basic services such as water and electricity – and hybrid forms spanning formal and informal approaches. Their fragmented geographic footprints reflect their inequality, from exclusive suburbs to sprawling low-density communities. These cities now face the challenge of restructuring to become inclusive, integrated, compact and sustainable hubs.

This need for urban transformation in post-apartheid South Africa extends beyond the physical form, to include the institutions and governance structures that oversee cities. South Africa's post-apartheid Constitution decentralised government across three spheres, sharing various responsibilities between national, regional and local authorities. This prompted new and amended policies, reshaped institutions and the civil service, and required capacity building within institutions.

Yet South African cities have not fully realised the anticipated urban dividend. Many face increasing inequality. Economic growth and job creation have not kept pace with population growth. Cities' spatial forms remain stubbornly fragmented, and the devolution of governance has not delivered adequate institutional reforms.[4]

PEAK in South Africa

PEAK's African research was based in South Africa, as the focal point for regional development. Centred on Cape Town, it shared the programme's global mandate to better understand the complexities and specifics of rapidly evolving urban forms, to inform effective policymaking for sustainable, inclusive cities of the future.

The research was not based on "traditional" theories of urban scholarship centred on the global North. Deeply rooted in the realities of African urbanisation, it was designed to uncover and understand the unique urbanisation processes, forms of momentum and challenges in cities in South Africa and across the African continent.

Image credits: Adobe Stock

The PEAK Urban Approach

An innovative approach to urban inquiry and action guided the research that informs this report. It defines a way of asking questions, employing methods for inquiry, gathering and analysing data and reflecting or acting on the implications of findings. Organised into the acronym PEAK – Prediction, Emergence, Adoption and Knowledge – and underpinned by principles that apply to all urban contexts globally, the approach is useful in guiding urban interventions, including policymaking, placemaking and investments.[11] The research considered the four constituent elements of PEAK together, leveraging each as required. This report demonstrates how use of these elements supports urban inquiry and intervention.

P – Prediction and projection
PEAK emphasises interdisciplinary inquiry into city futures, based on urban sciences that use new sources of urban data, providing unprecedented – often real-time – information on urban dwellers' activities. This includes tracking telecoms data, satellite imagery and street photography; personal and environmental statistics from mobile apps and fixed sensors, and social networks via online platforms. However, the increasing pace of urban change limits the accuracy of longer-term predictions from new data and methods. Predicting urban futures also requires other forms of understanding the city, including institutional analysis and ethnography.

E – Emergence
Cities are constantly evolving and building on what already exists. They are never finished. The concept of emergence rests on the understanding that city systems are rarely in equilibrium. The urban health system, for example, is made up of components including individuals, collective actions, technologies, markets and infrastructure. As the system and its parts change, interactions with other city systems result in newness emerging. In particular, technological changes within systems can reconfigure city economic and social life. Even minor changes at the interface of different systems can generate major changes in the complex system of the whole city.

A – Adoption
Histories and geographies matter in understanding how city systems work and evolve, shaping the ideas and technologies a city adopts. Complex systems display characteristics of "lock in" and "path dependency", with the city's past and its geography shaping but not necessarily determining its future. As a result, knowledge and technologies are taken up, valued and captured differently by cities. Residents may use and be affected by technologies in ways different from other cities or neighbourhoods. The future city is shaped by the needs of both present and future generations.

K - Knowledge
Different approaches to understanding and alternative models of scientific knowledge are rooted in diverse moral values and valuation scales, which can at times be competing, contested and not directly comparable. For example, the values informing an economist's analysis of developing housing in a forested area may clash with those of an environmentalist. These values influence how the city is understood from alternative vantage points. However, different perspectives – including those of urban actors such as elected officials, appointed professionals or community groups – have merit. Through dialogue between these perspectives, policymakers can avoid sub-optimal interventions that affect parts of the city, rather than the city as a whole. Urban futures are shaped by balancing often competing elements, and power structures affect how loudly different voices are heard. This demands an ability to see the city from different perspectives, to recognise structures of power and influence, and to mediate, evaluate and understand such trade-offs.

Footnotes to accompany visual on page 2:

1 Source unless otherwise indicated: CIA World Factbook. 2021. **https://www.cia.gov/the-world-factbook/countries/south-africa/#introduction**

2 World Population Review. **https://worldpopulationreview.com/world-cities/johannesburg-population**

3 Department of Statistics, South Africa. **https://www.statista.com/statistics/874035/household-disposable-income-in-south-africa/**

4 Ministry of Cooperative Governance and Traditional Affairs, South Africa. **https://www.cogta.gov.za/ddm/wp-content/uploads/2020/11/City-of-CT-September-2020.pdf**

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6 CIA World Factbook. **https://www.cia.gov/the-world-factbook/countries/south-africa/#introduction**

7 City of Cape Town. State of Cape Town Report 2020. **https://resource.capetown.gov.za/documentcentre/Documents/City%20research%20reports%20and%20review/State_of_Cape_Town_2020_Visual_Summary.pdf**

8 Ministry of Cooperative Governance and Traditional Affairs, South Africa. **https://www.cogta.gov.za/ddm/wp-content/uploads/2020/11/City-of-CT-September-2020.pdf**

9 City of Cape Town. State of Cape Town Report 2020. **https://resource.capetown.gov.za/documentcentre/Documents/City%20research%20reports%20and%20review/State_of_Cape_Town_2020_Visual_Summary.pdf**

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11 Siemens African Green City Index. 2021. **https://assets.new.siemens.com/siemens/assets/api/uuid:cf26889b-3254-4dcb-bc50-fef7e99cb3c7/gci-report-summary.pdf**

12 J. Williams, L. Petrik and J. Wichmann. PM2.5 chemical composition and geographical origin of air masses in Cape Town, South Africa. Air Quality Atmosphere & Health. March 2021. **https://www.researchgate.net/publication/346131624_PM25_chemical_composition_and_geographical_origin_of_air_masses_in_Cape_Town_South_Africa**

13 Department of Statistics, South Africa. **https://www.statssa.gov.za/?page_id=1021&id=city-of-cape-town-municipality**

14 Department of Statistics, South Africa. **https://www.statssa.gov.za/?page_id=1021&id=city-of-cape-town-municipality**

15 Cape Town Transport 2019. **https://tdacontenthubstore.blob.core.windows.net/resources/756c7e76-1ab5-45a9-9e97-ecee4e150e79.pdf**

16 Health Systems Trust, District Health Barometer 2019/2020 report. **https://www.hst.org.za/publications/Pages/DHB2019-20.aspx**

17 Department of Statistics, South Africa. **http://www.statssa.gov.za/publications/Report-03-09-08/Report-03-09-082011.pdf**

PEAK Urban

The **PEAK** approach helps urban actors **PREDICT** aspects of city life, understand **EMERGENCE**, **ADOPT** appropriate interventions, and facilitate **KNOWLEDGE** exchange to support urban inquiry and action.

in SOUTH AFRICA

PREDICTION
Look ahead through a powerful lens, using data and new analytics

Example of PEAK in action:

Transdisciplinary research approach:

Pooling together different knowledge sectors (health, sanitation, urban planning, housing, and other urban-relevant departments)

v

Combine data and inform new urban health knowledge

v

Leading to localised urban health profiles that inform sustainable and healthy development

See p. 8

EMERGENCE
Understand how different systems interact to create new consequences

Example of PEAK in action:

Goal: Treat and prevent HIV/AIDS in urban South Africa

Local organisations + International donor support

Safe spaces for men who have sex with men (MSM)

Through community development MSM spaces have evolved beyond treatment and prevention

Responding to social, economic, spatial challenges

> Which may not always fit neatly into current international HIV and MSM donor mandate

See p. 8

ADOPTION
Use the right technologies and solutions for each urban context

Example of PEAK in action:

Migrants harness new technology...

...to enable formal and informal financial flows...

...disrupting traditional money-transfer systems.

See p. 14

KNOWLEDGE
Value and combine different stakeholders' knowledge to co-create new learning

Example of PEAK in action:

Goal: Optimise urban health

150 cross-sectoral participants in PEAK's seminar series, who co-created new knowledge on aligning Cape Town's urban strategy with the Sustainable Development Goals
See p. 10

Policymakers + Communities

Policy:
- Noise reduction
- Access to nature
- Cut overcrowding

See p. 8

PEAK research and findings in Africa

1. Reframing urban health

The immediate link between health and the physical urban space is clear: poor built infrastructure, homes and services increase risks of infectious diseases, chronic respiratory diseases, accidents and injuries, and mental health disorders. Informal urban settlements are generally associated with inadequate housing, overcrowding and a lack of basic services, and the associated harm to residents' health can entrench socio-economic inequalities.

Addressing the many factors influencing urban health requires interventions that exceed the mandate of health departments alone. PEAK researchers expanded the urban health lens to consider other equally urgent factors, stressing the importance of collaborative partnerships and co-produced knowledge to refine urban policies for improved health.

Shaping healthy homes in informal settlements

Research found that urban policy should consider how people's interaction with the built environment affects their health and wellbeing.[6,7] Measures to upgrade South Africa's informal settlements have focused on service delivery and infrastructure, such as water or electricity provision. Yet wellbeing is also influenced by how people interact with their homes and the wider built environment through psycho-social factors such as noise, overcrowding, personal safety in the home and public spaces, and access to nature and places to exercise. These impact physical and mental wellbeing in the same way as having clean water to prevent water-borne disease, or domestic electricity to prevent air-polluting cooking methods from harming respiratory health. This makes it vital that policymakers bring a wide array of stakeholders together to optimise health in urban settlements by looking beyond service delivery or infrastructure – a process that must include incorporating community voices into collaborative decision-making.[8,9]

Inclusive policy processes for improved sexual health

Often called "Africa's gay capital", Cape Town is regarded as progressive in embracing a community often stigmatised and excluded. Yet male same-sex communities still experience high levels of HIV infection and sexuality-based violence and discrimination, especially in informal and economically marginalised spaces. These problems can be exacerbated by internationally driven HIV programmes, which are often based on a one-dimensional view of male same-sex communities, regarding them as relatively passive recipients of support. This means initiatives can fail to align with community needs, undermining the long-term sustainability of these vital programmes.

Such initiatives include the development of "safe spaces" in Cape Town's economically marginalised urban communities. Situated in people's homes or local halls, these initiatives promote HIV prevention and encourage treatment, with an emphasis on testing men for HIV and initiating anti-retroviral treatment when needed.[10] However, this approach can ignore the wider material and aspirational needs of these communities, including strategies to build resilience, address socio-economic inequalities and enable wider skills training. This risks fracturing the relationship between international donor aid and male same-sex groups, potentially depriving this community of support and funding. In response, donors should base programmes on participatory designs, to ensure they align with community needs and take more inclusive approaches to delivering health-related support.[11]

Strong urban governance to boost post-pandemic resilience

The United Nations estimates that 95 per cent of Covid-19 cases occurred within cities. PEAK research shows that to cope with future public health emergencies on a similar scale, cities need urgently to upgrade informal settlements and redress urban inequality.[12] Virus containment measures influenced how people moved within and between cities,[13] and the continued economic slow-down is likely to impact cities' revenues. The World Bank anticipates that the pandemic will create a "wave of 49 million new urban poor, affecting millions of rural-urban migrants". This will add to the pressure of the one billion people already living in informal urban settlements globally.[14]
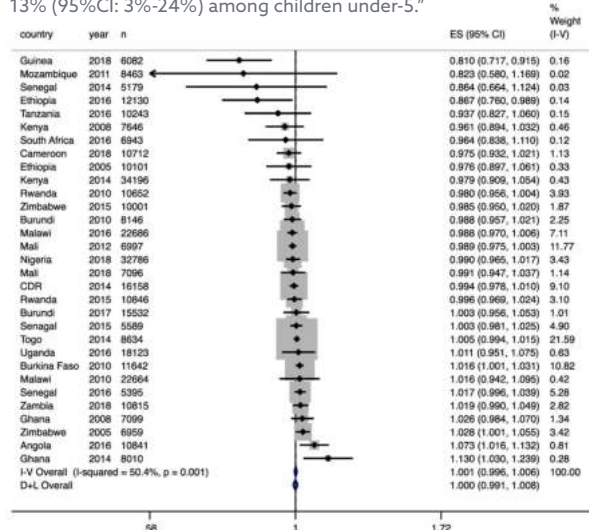
Image credit: Gina Ziervogel

In African cities the pandemic is likely to result in residents' relocation from informal settlements to the urban periphery, increasing social exclusion. To reduce infection risk and social inequality, urban policy must aim to upgrade informal settlements. This requires strong governance processes, such as setting up collaborative partnerships between informal settlement communities, non-governmental organisations and local government.[15]

Supporting the continuum between formal and informal food networks

Food systems in African cities include formal and informal markets, and non-market-based sources, such as own-production and food transfers. People draw their nutrition – a critical aspect of urban health – from a complex network of sources, including supermarkets, informal markets, small shops, self-production (such as vegetable-growing), sharing or borrowing food, food remittances,

community kitchens and food aid. This spectrum implies policymakers and planners should accept formality and informality in the food system as a continuum, rather than a dichotomy for which the only solution is to formalise the informal.[16] In this way, the PEAK approach addresses the emergence of urban forms – including by embracing different types of knowledge, generated by stakeholders ranging from planning experts to local residents.

Gaps in knowledge: the impact of air pollution on African children

Upgrading the urban environment to improve residents' health requires understanding not only of the impacts of the built environment, but also of the health risks from air pollution. PEAK researchers analysed health and air pollution data from 21 countries in Sub-Saharan Africa for possible correlations between ambient air pollution and the prevalence of coughs or acute lower respiratory infection in children under the age of five. Although they found no overall correlation, there were significant correlations between pollution and cough in several countries, highlighting the urgent need for further investigation into the concentration, distribution and toxicity of ambient air pollution across Africa, and its impact on children's developing lungs.[17] This is especially important given that Africa's rapid urbanisation means that air pollution is likely to emerge as a major environmental health risk in the near future.

Figure 1: Associations between prior-month PM2.5 concentration (per 1 µg/m3 higher) and prevalence of cough (in the past two weeks across Demographic Health Survey in sub-Saharan Africa.

Note: ES=effect size. ES>1 indicated a positive relationship (i.e. higher risk) in that given surveyed population, and if the 95% confidence interval (CI) has excluded 1, it indicated that this positive relationship was statistically significant. For example, in Ghana 2014 survey, we observed that for every 1 µg/m3 higher of recent PM2.5 exposure, the prevalence of cough was higher by 13% (95%CI: 3%-24%) among children under-5."

Source: Cai Y.S., Gibson H., Ramakrishnan R., Mamouei M. & Rahimi K. Ambient Air Pollution and Respiratory Health in Sub-Saharan African Children: A Cross-Sectional Analysis.

> PEAK's approach challenges prevailing attitudes and invites policymakers to consider new ways to embrace informal urban systems.

2. Cross-sector, multi-level governance

Post-democratisation in 1994, South Africa adopted a decentralised governance model, dividing administrative, political and fiscal responsibilities between different spheres of government across national, regional and local levels. However, this can mean that urbanisation processes present development challenges that fall outside a municipality's legal or financial jurisdiction, even though they unfold within its geographical footprint. The budgets and mandate for various elements of urbanisation might instead fall within the remit of provincial or national government. PEAK researchers explored the implications of this complexity for sustainable, inclusive urban development.

Translating global policy to city scale

Goal 11 of the UN Sustainable Development Goals (SDGs) recognises the central role of inclusive, safe, resilient cities for a sustainable global future. While national governments are the coordinating and decision-making authorities for implementing international policies, urban authorities are key to realising them at city level. To explore how global policies are translated within the city, PEAK researchers examined how the SDGs are being realised in Cape Town. The PEAK focus on adoption highlighted the need for policymakers and governance officials to consider whether and how international policy directives are taken up by municipal governments, which may not be aware of what is required or fiscally empowered to deliver it.

The research examined the complexities of localising international agreements, the need to work across levels of government, the limitations of pre-existing data, the importance of improved reporting systems, and the need to work collectively with other cities. It found that successful localising of the SDGs requires awareness-raising and advocacy with a wide range of local governance officials and other key stakeholders, to align strategic city-level aims and investment to the SDGs. The goals' cross-cutting nature requires increased cross-sectoral, intra-departmental collaboration – echoing PEAK's emphasis on the co-production of new knowledge by a range of stakeholders. Officials should align city monitoring and evaluation systems to SDG indicators, reporting on progress internally, as well as participating in official SDG local reviews.

The research also explored how the internal workings of city structures can complicate implementing international agreements at city level, given different, sometimes conflicting, development agendas.[18,19,20,21] A city's programme to deliver adequate housing might conflict with the sustainable, low-carbon development encouraged by the SDGs or the Paris Agreement, if it uses conventional construction methods. Implementing such agreements therefore requires trade-offs between different levels of government to accommodate competing demands.

Cape Town seminar series: co-creating new knowledge

Implementing the SDGs at city level requires policymakers to align the goals with existing local development agendas, mandates, resources and monitoring frameworks. This results in gaps, tensions and trade-offs. Navigating these complexities requires extensive collaboration between different stakeholders.

In exploring how to localise the SDGs in Cape Town, researchers built on an existing partnership between the city authorities and the University of Cape Town. For a year, PEAK researchers held monthly seminars allowing different actors to exchange thoughts and experiences related to local SDG implementation.[22] Topics included local financing for the goals, citizen-centric approaches to achieving them, and the need to improve data for monitoring and reporting on progress.

The seminars brought together around 150 participants from diverse backgrounds, including city, provincial and national government, the private sector, NGOs, urban planning and different academic disciplines. Their exchanges enabled the co-production of knowledge that underpins the PEAK approach, helping align Cape Town's Resilience Strategy with the SDGs, and develop a UN Voluntary Local Review on the goals. Participants also fed into a growing global community of practice relating to SDG localisation, and built new and strong connections to strengthen Cape Town's progress towards the goals.

Strengthening capacity for strategic urban governance reform

To deliver sustainable, inclusive urban cities, South Africa needs to transform its largely fragmented, sprawling and often exclusive urban areas into compact, integrated forms. In response, the country's National Treasury set up the Cities Support Programme (CSP) in 2011 as an inter-governmental unit, working across departments to strengthen cities' governance capacity, support fiscal and policy reform, and catalyse spatial transformation.

The CSP offers a national strategic umbrella for urban reform, yet is explicitly responsive to a city's particular experiences and context, eschewing a "one-size-fits-all" approach. To identify lessons learned through this innovative framework, PEAK researchers collaborated with the programme to document its experiences and develop new knowledge, capturing examples of innovation across sectors and scales of governance.[23,24] They also examined the country's history of national-level urban reform, to understand the big picture of South Africa's evolving urban policy and practice, and the factors that created the need for the CSP. Their results documented how people tasked with governing cities exchange knowledge and adopt solutions to promote effective governance, and identified opportunities to strengthen the reform process.

3. Embracing informal housing solutions

South Africa has a housing shortage in both the private and state-subsided sectors, leading to occupations of vacant or underutilised land and buildings, and overcrowded, often under-serviced informal communities. Cities also need to redress the unequal apartheid-era spatial divisions cemented into their middle-class suburbs, lower-income state-subsidised neighbourhoods, and informal settlements. PEAK research documents how these factors shape localised and city-wide policies and practices relating to spatial transformation and public investment.

Claiming a home: competing interests between state and people

Examining informal occupations of land or buildings in Cape Town, PEAK researchers confirmed that communities and the authorities can have competing interests and intentions.[25] The state can see occupiers as "bad citizens" who disregard the rule of law and the state's formal housing programme, particularly when occupations involve property intended for other developmental priorities. From this perspective, occupiers should "wait their turn" for subsidised housing, rather than bypass established allocation systems. Conversely, occupiers believe they are realising their constitutional right to adequate housing and basic services, correcting the shortcomings of an unfair, capitalist housing market. They view their occupations as a profoundly political and democratic act, holding the government to account over housing, which has become increasingly unaffordable as it is incorporated into global markets.

Image credit: Barry Christianson

People who informally occupy vacant buildings believe they are realising their constitutional right to adequate housing and basic services.

These competing approaches to housing shortages complicate city officials' decision-making over issues such as whether to evict occupiers or compensate owners. Yet acknowledgement of such opposing rationales also helps highlight that informal urban settlements and systems are here to stay, and should therefore be viewed as legitimate elements of functioning cities. The government's inability to meet housing needs means informal "self-provision" will find ways to outstrip formal provision. Policymakers must acknowledge this and create systems that support rather than persecute self-provision, to address housing shortages in the city.

Building occupations: property hijacking or constructive retrofitting?

Informal occupations of existing buildings are mostly by people seeking a foothold in the city, who usually target abandoned, privately-owned residential buildings. Yet Cissie Gool House has been occupied by people who work in its rapidly gentrifying neighbourhood, or who used to live locally but can no longer afford to do so. The building is in a semi-vacant, state-owned hospital complex about a kilometre from Cape Town's centre. Many of the occupiers were evicted from their previous homes – for example, through gentrification processes.

Image credit: Barry Christianson

Residents occupying Cissie Gool House in Cape Town have reworked the interior for residential purposes, including a communal area hosting public meetings, classes and events.

Although the government is seeking to evict them again, labelling them as criminals for occupying a state-owned building, Cissie Gool's residents are deeply engaged with shaping their new home. They have retrofitted existing infrastructure by connecting the building to outdoor utility points, improvising access to water, electricity and other services. They have also reworked the interior for residential purposes, creating individual living quarters by dividing larger rooms and designating areas for common use. A former staff dining room is now a communal area hosting weddings, community feeding schemes, yoga classes, public meetings and church services.

Viewing the occupiers' experience though the PEAK lens highlights informal housing as a vital aspect of emergence within evolving cities. As cities become more densely built and vacant land scarcer and more peripheral, retrofitting underutilised buildings – particularly through bottom-up actions such as occupations – will become an increasingly important mode of urban development throughout the global South.[26]

Embracing informality as a legitimate city form

Urban informality is here for the longer term, and needs to be seen as a valid part of the city form. Viewing settlements or systems as "informal" suggests the need to improve and formalise them, along a linear development route on which the ideal modern African city has eradicated informality. While there is need to improve the built environment and services to communities, the reality is that the future of cities in the global South is a hybrid of formal and informal.

Research into mothers' mobility in Abidjan, Cote d'Ivoire, shows how women use informal transport to carry out their vital roles generating income, providing care and running households. This usage is a critical part of urban infrastructure, including supply chains.[27] Transport planning traditionally prioritises male commuting over other types of travel – undermining women's mobility and deepening gender-based exclusions – yet cities adapt to meet such challenges.

In 2019, several privately imported motorised rickshaws began operating in Abidjan's informal neighbourhoods. Perceived by passengers as providing an important last-mile service connecting them with onward transport networks, the service expanded rapidly, but the authorities soon banned it as unregulated. Its clandestine continuation shows the vital links informal transport provides in daily urban life, and calls for policy support for the popular transport networks which women rely on to perform their essential roles.[28]

PEAK's approach to understanding such emergence in cities can help urban stakeholders to reframe their view of informality and encourage processes that embrace it constructively.[29] These could include creative models of granting tenure or permits, decentralising service provision, or co-designing informal infrastructure with users or residents.

4. Financial flows in the evolving city

From how companies structure wages, to the design of national fiscal transfer systems, money circulates through cities in complex ways that are fundamental to how a city emerges. PEAK research explored these financial flows and systems to understand ways in which money actively produces and sustains the city through a variety of entry points. Some originate from the state, such as infrastructure investment and tax systems. Others emerge from city residents adopting new technologies, such as money transfers via mobile phone.

Spreading the load: Africa's decentralised service delivery

PEAK research understands urban service delivery as involving a constant state of "fractured" fiscal authority. A city's capacity for service delivery results from many different actors and infrastructural arrangements, which might not have direct lines of communication or collaboration.[30,31] City governments are increasingly positioned as key actors in global and local development programmes, but in reality, they face significant limits to their control in these processes. Constraints on their mandates and budgets often require them to work with other spheres of government, the private sector and communities. A mayor, for instance, might be aware of a city's need to respond to climate change through reducing pollution or offsetting its likely impacts, but the city administration may have no control over policies or spending relating to industries or the transport sector within the city boundaries, even though these contribute to emissions or are vulnerable to extreme weather events. Understanding these "fractures" can help policymakers create the necessary structures and lines of communication to alleviate financial constraints and close gaps in service delivery.

Water and revenue during severe drought

Moments of crisis expose tensions often implicit yet hidden within cities' fiscal models. Cape Town's record-breaking drought of 2018 illustrates an external crisis colliding with the city's internal fiscal contradictions. The city is unusual in having greater control over its service delivery infrastructure and fiscal base than many other African cities. Its government controls water delivery, which provides an important source of revenue via a progressive tariff system. Low-income users pay less per litre than higher-income and non-residential consumers, with this cross-subsidisation between income levels key to the city's functioning.

During the drought, the city encouraged residents and businesses to reduce water consumption, and enforced limitations through meters that rationed supplies each day. Many middle-class residents and higher-income businesses left the centralised network, using a range of emergent and decentralised technologies to maintain consumption, such as borehole water, recycling household grey water and own-water catchment. However, this had acute implications for the city's budget, dramatically lowering overall revenue. This tension highlights competing demands often faced by cities, which must balance divergent needs. It also exposes important contradictions between green policy responses at household level and fiscal management at city level.[32]

Image credit: Gina Ziervogel

Cities face competing demands and must balance divergent needs, such as green policy responses at household level and fiscal management at city level.

Remittances: how micro-money flows feed into the wider economy

Remittances shared by migrants across Africa are central to development, raising questions about how to make remittance systems cheaper for users, while managing the regulatory and financial risks for states and companies. Examining remittance service providers to Cape Town's Congolese community, PEAK researchers found that the legacy systems which have cornered the market for transnational money transfer for decades are being disrupted. This change comes from several sources, including informal providers (such as logistics companies), tech companies and retail outlets. The research also found that remittances move in a circular fashion, as opposed to linear and binary ways, with a blurred overlap between formal and informal money flows. Digital technologies such as cellphones and platforms are central to remittance infrastructures, and migrants themselves make up the fabric of remittance networks, with their movements defining the networks' shape and reach.

Communities are constantly adopting new technologies and harnessing them to address their needs, whether connected to migration, cross-border movements of people and money, or formal and informal financial flows.[33] City planners also need to understand how demand for remittance services is manifested in the physical fabric of the city – for example, many remittance services use the infrastructure of supermarkets. These factors suggest that financing for sustainable urban development could maximise effectiveness by building on existing fiscal and financial systems which reflect cities' governance and physical configurations on the ground. [34]

Employment equity law boosts women in the workplace

South Africa's 1998 Employment Equity Act aimed to restructure the labour market to be more accessible to women and people most affected by apartheid discrimination. PEAK research explored how the Act has influenced women's movement between industrial sectors, and whether it has changed the gender wage gap. It found that firms that became compliant with the Act hired new female workers from a greater diversity of sectors, and that this increased a company's average female wage. They also found that the more male-dominated an industry was, the higher the diversity of its female inflow, and the smaller its gender wage gap.[35] This has positive ripple effects across the city. A more inclusive, gender-representative labour force, with more equitable wages, puts more money in women's pockets, enhancing their domestic and social autonomy, boosting household food security and improving children's education.

Recommendations

PEAK research findings highlight the value of a systematic, wide-angled approach to urban policymaking at all levels. This entails using innovative prediction tools, understanding the interactions that shape how cities emerge and the ideas they adopt, and targeting knowledge exchange across sectors.

These recommendations apply to all actors who shape the urban ambit at all levels and from different angles. In particular, they are aimed at Africa-focused international agencies and donors, development banks and investors, central and city government planners and departments, urban practitioners, academic and research institutes, and international and non-governmental organisations.

Each should interpret and apply these recommendations according to their role and context, and encourage colleagues and partners at all levels to adopt these approaches. This will create the coordination needed to optimise policy for sustainable, equitable cities in Africa and similar rapidly urbanising contexts.

Reform planning philosophies to guide and coordinate, and embrace informality

PEAK research shows cities as constantly dynamic – in terms of population movement, governance, technology use or the underlying forces driving urbanisation. Despite increasingly advanced data-led prediction, the futures of cities can never be fully known. This means policymakers can best achieve sustainable, equitable cities by replacing urban planning philosophies of rigid regulation and top-down control with flexible guidance and participatory coordination. PEAK research in areas including housing, food supply and transport shows that embracing informality will be key to maximising efficiency in urban futures.

Govern across sectors and levels to address urban complexity

Governing the city as a "system of systems" extends beyond the creation of the physical urban

form. Effective urban development must embrace capacity building among policy officials and city institutions, engagement with citizens, rethinking service delivery systems, and designing appropriate funding mechanisms. This is an iterative, collaborative process, involving multiple actors, including different spheres of government, citizens, civil society, the private sector and development organisations. Participatory city-making requires actively working across silos, institutions, departments and sectors, underpinned by critical thinking and evidence-based research.

Acknowledge and support urban residents' role in shaping cities

Urban residents make the city on a daily basis, through their everyday decisions, actions and practices. Progressive city governance must acknowledge this and draw people into shaping the city. Although South Africa's democratic process is designed for public participation, policymaking may not always sufficiently include citizens' voices. Urban policy should foster an active civil society to help shape policy and hold the state accountable, embracing citizens' valuable knowledge on adapting to and managing urban challenges. Stakeholders must think creatively about how to bring urban residents and civil society groups into discussion with other urban governance actors, and work hard to foster persistent engagement with a city's people.

Provide multi-stakeholder forums to manage contradictions

PEAK's research exposed the regular need for urban governance to address and manage contradictions, such as those between housing construction and emissions reduction; limiting water supplies and raising city revenue, or private property rights and the right to decent accommodation. By exposing conflicting rationalities, PEAK research helped highlight the different priorities shaping actors' values and the types of knowledge they adopt. To align these different values and perspectives, policymakers should create constructive forums allowing diverse stakeholder engagement. These support the vital role of collaboration, network-building and critical thinking, allowing actors to step back from intense, day-to-day city life and management, to think strategically about how to realise a just, sustainable future.

Promote cross-sectoral knowledge exchange and solutions

By embracing and developing knowledge from different sectors and disciplines, policymakers can better understand the challenges they need to address and develop solutions that can be applied across different sectors for maximum effect. Targeted knowledge exchange on people's engagement with the built environment or how they procure their food can promote urban health, for example. Documenting what is emerging in today's city allows for better forecasting and planning, to build the city of tomorrow. PEAK demonstrates the huge potential for different stakeholders to engage with urban governance and knowledge co-production that captures and analyses the details of reform and innovation as they unfold.

Establish frameworks to implement global policies at local level

Urban frameworks that allow for multi-level governance may not be robust enough for the collaboration and coordination needed between levels of government and different urban actors to localise international agreements such as the SDGs. Policymakers must establish governance mechanisms with institutional, technical and financial capacity to strengthen the interplay between international and local approaches, and support effective implementation and monitoring of regional and global development targets.

Use the PEAK framework to investigate complex urban issues

The PEAK framework is particularly useful to underpin planning on complex, multi-faceted urban issues. It can be used to diagnose barriers and enablers to inclusive, sustainable development at city, regional and national levels (such as rigid, top-down planning approaches) and design integrated development programmes which draw on various knowledge sources, including local communities. International, regional and national investment partnerships and coordination mechanisms should support such programmes, to optimise development of sustainable cities, inclusive of all their people.

Conclusion

To meet the SDGs by the 2030 deadline, policymakers must achieve dramatic transformations in existing cities and create sustainable new urban spaces. In this context, the PEAK framework offers specific insights for

policymakers to act on, while also showing the value of a cross-sectoral, collaborative approach to urban policymaking. By revealing how different urban systems interact to create the overarching city system, PEAK allows policymakers to respond to the realities of cities as they emerge, rather than trying to mould them into forms that could potentially ignore the underlying drivers of urbanisation.

Building on the PEAK approach in Africa

This report highlights leading insights from PEAK's new understanding of the city as an emerging system of interacting systems. Given the speed and deep uncertainties of rapid urbanisation across Africa, planners need advanced understanding to predict urban futures – from patterns in people's daily lives, to how cities as a whole emerge. This allows policymakers to see how Africa's cities challenge traditional concepts in urban research and brings new insights to support sustainable urban futures. The PEAK framework offers an important new approach to underpin this process and guide prediction, understand emergence, inform adoption and share knowledge which can inform policies to transform African cities.

From individual lives to global sustainability

As urbanisation increases and cities become critical to our planet's future, PEAK's collaborative approach gives international institutions, donors and investors a more powerful lens through which to see the interactions that generate new urban characteristics. Its interconnected networks of knowledge and action provide the global policymaking community with new approaches to harness and optimise urbanisation processes, helping cities fulfil their central role in achieving the SDGs.

Resources

For a wide range of project overviews, journal articles, policy and research briefings, and blog discussions, visit our Africa research pages, including:

National urban reform in South Africa

https://www.peak-urban.org/project/national-urban-reform-south-africa

Everyday mobilities in African transport systems

https://www.peak-urban.org/project/everyday-mobilities-african-urban-transport-systems

Analysing human settlements transformation in Cape Town

https://www.peak-urban.org/project/analysing-human-settlements-transformation-cape-town

Assessing SDG localisation in Cape Town

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Linking the environment and risk of respiratory infection in children in Sub-Saharan Africa

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Health and sexuality in Cape Town

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To find out more, visit the PEAK website or contact **peakurban.director@compas.ox.ac.uk** or **andrew.tucker@uct.ac.za**.

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About us

The PEAK Urban programme aims to aid decision-making on urban futures by:

1. Generating new research grounded in the logic of urban complexity;

2. Fostering the next generation of leaders that draw on different perspectives and backgrounds to address the greatest urban challenges of the 21st century;

3. Growing the capacity of cities to understand and plan their own futures.

In PEAK Urban, cities are recognised as complex, evolving systems that are characterised by their propensity for innovation and change. Big data and mathematical models will be combined with insights from the social sciences and humanities to analyse three key arenas of metropolitan intervention: city morphologies (built forms and infrastructures) and resilience; city flux (mobility and dynamics) and technological change; as well as health and wellbeing.

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Our framework

P Prediction — What can we now predict and project about cities?

E Emergence — What types of urban structures and systems are emerging?

A Adoption

K Knowledge Exchange — How can we maximize this knowledge globally?

The PEAK Urban programme uses a framework with four inter-related components to guide its work.

First, the sciences of **Prediction** are employed to understand how cities evolve using data from often unconventional sources.

Second, **Emergence** captures the essence of the outcome from the confluence of dynamics, peoples, interests and tools that characterise cities, which lead to change.

Third, **Adoption** signals to the choices made by states, citizens and companies, given the specificities of their places, their resources and the interplay of urban dynamics, resulting in changing local power and influencing dynamics.

Finally, the **Knowledge** component accounts for the way in which knowledge is exchanged or shared and how it shapes the future of the city.

PEAK Urban is a partnership between: