water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

NATIONAL SANITATION INTEGRATED PLAN

VERSION 5
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Contents

Preamble

The Department of Water and Sanitation (DWS) developed the National Sanitation Integrated Plan (NSIP) to help coordinate and improve the delivery of sanitation services in South Africa.

The NSIP is a 10-year roadmap to accelerate the provision of adequate, equitable and safely managed sanitation services, thereby eradicating sanitation backlogs and improving performance, whilst creating pathways to generate economic opportunities in the sanitation sector. It guides the sector in responding to the 2016 National Sanitation Policy to ensure the sustainable management of sanitation services across all the components of the sanitation service chain and the strengthening of institutional aspects that impact the provision of sanitation services.

The NSIP sets strategic direction by identifying short-, medium- and long-term actions. These actions are a roadmap for the sanitation sector to coordinate efforts to:

- achieve universal access to sanitation and hygiene that are managed safely
- turn around the current decline in performance in the delivery of sanitation services
- strengthen the regulatory framework for on-site and non-sewered sanitation
- respond to climate change and improve the climate resilience of the sanitation sector
- create economic opportunities along the sanitation service chain
- find innovative ways to deliver sanitation services and use alternative sanitation technologies
- address key sector challenges such as:
  - the practice of open defecation
  - the use of bucket toilets and unsafe pit latrines
  - the rise in the use of chemical toilets

Since 1994, South Africa has made progress in delivering sanitation services, but the country must still find ways to deliver sanitation services to all households in South Africa – and to do so in a way that is safe for all people and the environment.

The purpose of this plan is, amongst other things, to help strengthen the status of institutional aspects across the sanitation sector and to promote sanitation services that are efficient, sustainable and accessible to all.

Safe and efficient sanitation and hygiene improve people's quality of life, thus contributing to positive public health outcomes by lowering the risk of disease, and they stimulate economic growth and protect the environment for future generations.

Message from the Minister

Access to safe and hygienic sanitation is a human right enshrined in the Constitution of the Republic of South Africa and contributes to improved public health, dignity, and a clean environment. In an endeavour to execute the Constitutional mandate, the government of South Africa has committed to achieve the vision and objectives of the National Development Plan (NDP), which set the target that all South Africans should have access to affordable, reliable, and hygienic sanitation by 2030. The NDP coincides with Sustainable Development Goal (SDG) Target 6.2 on sanitation and hygiene.

The government has made significant progress in ensuring universal access to improved sanitation. Households with access to improved sanitation increased from 61.7% in 2002 to 84.1% in 2021. Despite this, the recent Green Drop report indicates that sanitation services continue to decline and that fundamental reform is required to arrest and turn around the decline in municipal sanitation services. Furthermore, although the government started a bucket eradication programme in 2012, the programme has been unsuccessful because municipalities keep initiating new bucket systems in informal settlements. These and other challenges limit the government's ability to ensure universal sanitation access to all households, including the safe management of each component of the sanitation service chain. There is an urgent need to focus on sustaining existing sanitation infrastructure whilst investing in new infrastructure to respond to rapid urbanisation. The implementation of sanitation is currently fragmented in South Africa and an integrated plan and a coordinated effort are required to turn this situation around.

The National Sanitation Integrated Plan (NSIP) responds to these needs and seeks to prioritise and accelerate sanitation provision aligned to commitments of the NDP 2030, the National Water and Sanitation Master Plan (NWSMP), and the SDGs. The NSIP provides a 10-year roadmap for service delivery in the sanitation sector to guide the eradication of backlogs (inclusive of bucket systems and open defecation), ensure the provision of appropriate alternative sanitation, and create a pathway to generate economic opportunities. Furthermore, the NSIP seeks to strengthen sanitation-related regulation through the inclusion of new criteria in an expanded Green Drop certification process. The NSIP sets targets for the short, medium, and long term, and the implementation of these actions will grow competency and capability, thus enabling improved performance both now and in the future.

Achieving SDG Target 6.2 will require cross-sectoral partnerships and collaboration between the government, the private sector, academic institutions, research institutions, civil society organisations, communities and other sector partners at all levels. The Cabinet-approved National Sanitation Framework will assist the government in providing equitable and safe sanitation to all settlement types. In addition, the planned amendments to the Water Services Act will enable the Department of Water and Sanitation to regulate and ensure adherence to the revised norms and standards for sanitation services.

With less than seven years until 2030 and approximately 2.8 million households without appropriate sanitation, I implore all sanitation sector stakeholders to support our efforts and accelerate the rate of access to safely managed sanitation in South Africa to ensure that no one is left behind, regardless of where they stay.

Ms Pemmy Majodina
Minister of Water and Sanitation

Message from the Director General

Despite the government's good progress in the provision of universal access to sanitation services, there are still households without access to improved sanitation services. Furthermore, we need to pay particular attention to the appropriate operation and maintenance of existing sanitation infrastructure, and the recent Green Drop report highlighted significant deficiencies at many wastewater facilities in South Africa.

The National Sanitation Integrated Plan (NSIP) presents the sanitation status within South Africa and its provinces, and highlights key challenges at national, provincial and local level. Despite current data limitations, a holistic baseline has been developed, a first for South Africa. Appropriate sanitation services planning needs to consider the entire sanitation services chain, and we encourage the sector to enhance monitoring and data management practices to help improve understanding of the current circumstances. Developing excreta flow diagrams (SFDs) can help support this.

The NSIP recognises the commendable efforts already undertaken in the sector, such as research and development initiatives aimed at creating alternative and innovative sanitation systems, the revision of norms and standards, the establishment of SANS 30500 standards for non-sewered sanitation systems, the formulation of the National Faecal Sludge Management Strategy, and various projects related to wastewater reuse, the circular economy, and energy efficiency and recovery. The measures proposed in the NSIP encompass the improvement of the sanitation delivery model, the prohibition of bucket toilets, the mitigation of the proliferation of chemical toilets, the integration of climate change impacts and climate resilience considerations into sanitation planning, the addressing of open defecation in urban areas, the enhancement of the implementation of alternative and innovative sanitation technologies and approaches, financial and funding considerations, and the identification of economic opportunities in the sanitation service chain. Additionally, the NSIP suggests amendments to the existing Green Drop certification criteria to ensure comprehensive regulation of the entire sanitation service chain. Furthermore, the NSIP reaffirms the socio-economic value of sanitation, urging the sector to view sanitation as a resource rather than mere waste.

The sanitation sector needs to be transformed in various ways, and the NSIP's 10-year roadmap aims to guide our response to help turn around sanitation services provision in South Africa. The NSIP distinguishes short-, medium-, and long-term actions in line with the seven pillars of the National Sanitation Policy (2016), which are integrated planning, institutional arrangements, participation, capacity and resource development, financial requirements, sustainability, and regulation. A monitoring and evaluation tool will help the sanitation sector track progress in performance and the implementation of required actions.

Through the implementation of the NSIP actions, we will continue to shape and evolve the sanitation sector in South Africa. This will help make sanitation services more resilient to future shocks and stresses. We resolve to continue to collaborate with key sanitation sector stakeholders and various programmes will be initiated to support the sector to implement NSIP actions. For the NSIP to be successful, we must all do our part and work together to address sanitation shortcomings and help drive sanitation performance improvement. The challenges faced by the sector cannot be the sole responsibility of the Department, and we will lean on sector stakeholders to support this exciting journey and help us meet the government's sanitation goals for South Africa.

We thank you for your commitment and look forward to this exciting journey with you over the next 10 years.

Dr SD Phillips
Director-General

Glossary of key terms

Basic sanitation service	The provision of a basic sanitation facility that is environmentally sustainable, easily accessible to a household and a consumer, the sustainable operation and maintenance of the facility, including the safe removal of human waste, grey-water and wastewater from the premises where this is appropriate and necessary, and the communication and local monitoring of good sanitation, hygiene and related practices (*Revised National Water and Sanitation Services Norms and Standards*, 2023).
Co-treatment	A term that is used to describe the treatment of faecal sludge at a wastewater treatment works (WWTW). A WWTW can process a certain amount of faecal sludge, depending on the WWTW design and the nature of the faecal sludge (DWS, 2023a) .
Excreta flow diagram	An excreta flow diagram (or shit flow diagram, SFD) is a tool used to readily understand and communicate how excreta 'flow' through a city or town. It shows how all excreta generated in a city is or is not contained as it moves from defecation to disposal or end-use. An accompanying report describes the service delivery context of the city or town (WRC and WIN-SA, 2017).
Faecal sludge	The contents emptied from an on-site system, and not transported by sewers. It includes liquid and solid contents of on-site systems such as container-based vaults, pit latrines, septic tanks, community toilets, or mobile toilets. Faecal sludge differs from other sludges that are products of the wastewater treatment process (DWS, 2023a).
Faecal sludge management	The management of human excreta from on-site systems, excluding package plants along the sanitation service chain, which includes containment, collection, transportation, treatment and disposal (DWS, 2023a).
Faecal sludge treatment plant	A treatment plant designed specifically for receiving and processing sludge derived from on-site sanitation systems, as opposed to sewage from a conventional waterborne sanitation system (DWS, 2023a).
On-site sanitation	A sanitation system in which excreta and wastewater are collected and stored or treated near where they are generated (e.g. on the plot or in the household) (*Revised National Water and Sanitation Services Norms and Standards*, 2023).
Off-site sanitation	A sanitation system in which excreta and wastewater are collected and conveyed away from the plot where they are generated. Uses a sewer network to convey wastewater from the toilet to treatment elsewhere. Off-site sanitation may be an option where a piped water supply is available to the property (DWS, 2023a).
Non-sewered sanitation	A sanitation system that is not connected to a networked sewer and that collects, conveys and fully treats the specific input to allow for safe reuse or disposal of the generated solid output or effluent (*Revised National Water and Sanitation Services Norms and Standards*, 2023). **NOTE**: This is a broad term that refers to sanitation systems that are not connected to a centralised sewer network and may encompass on-site solutions and other decentralised options.
Safely managed sanitation services	A sanitation service delivery outcome which results in a combination of hazard (excreta in the environment) and population exposure which is likely to result in a low public health risk (SA-SFD, 2024).
Sanitation services	The collection, removal, disposal or treatment of human excreta and domestic wastewater, and the collection, treatment and disposal of industrial wastewater. This includes all the organisational arrangements necessary to ensure the provision of sanitation services, including, amongst other things, appropriate health-, hygiene- and sanitation-related awareness, the measurement of the quantity and quality of discharges where appropriate, and the associated billing, collection of revenue and consumer care. Water services authorities have a right but not an obligation to accept industrial wastewater from industries within their area of jurisdiction.

Sanitation service chain	All aspects of the sanitation system, including capture and containment (e.g. toilet, septic tank), emptying and transportation (e.g. pipes, vacuum truck), treatment (e.g. WWTW, faecal sludge treatment plant), reuse and/or safe disposal (e.g. sludge beneficial use, deep row entrenchment). For-on-site sanitation systems means human excreta capture, containment, emptying of the pit, containment or tank, transportation, treatment, beneficial use or safe disposal of faecal sludge (*Revised National Water and Sanitation Services Norms and Standards*, 2023).
Wastewater (or sewage)	Water containing waste or water that has been in contact with waste material (*Revised National Water and Sanitation Services Norms and Standards*, 2023).
Wastewater treatment works	A plant designed specifically or predominantly for the receiving and processing of sewage from a waterborne sewage system.

Abbreviations

AMCOW	African Ministers' Council on Water
BOT	Build Operate Transfer
CapEx	Capital Expenditure
CBD	Central Business District
CBO	Community-Based Organisation
CBS	Container-Based Sanitation
CE	Circular Economy
CSE	Circular Sanitation Economy
CHP	Combined Heat and Power
CMA	Catchment Management Agency
CoGTA	Cooperative Governance and Traditional Affairs
DBE	Department of Basic Education
DBSA	Development Bank of Southern Africa
DHS	Department of Human Settlements
DoH	Department of Health
DPR	Direct Potable Reuse
DPWI	Department of Public Works and Infrastructure
DSI	Department of Science and Innovation
DWS	Department of Water and Sanitation
FS	Faecal Sludge
FSM	Faecal Sludge Management
GIAMA	Government Immovable Asset Management Act
GLAAS	Global Analysis and Assessment of Sanitation and Drinking-Water
HH	Household
IDP	Integrated Development Plan

IPR	Indirect Potable Reuse
ISO	International Organization for Standardization
IWA	International Water Association
JMP	Joint Monitoring Programme for Water Supply, Sanitation and Hygiene
KPA	Key Performance Area
M&E	Monitoring and Evaluation
MFMA	Municipal Finance Management Act 56 of 2003
MISA	Municipal Infrastructure Support Agency
MTSF	Medium Term Strategic Framework
MWth	Megawatt Thermal
NDP	National Development Plan
NEIMS	National Education Infrastructure Management System
NSIP	National Sanitation Integrated Plan
NSP	National Sanitation Policy
NT	National Treasury
NGO	Non-Governmental Organisation
NPO	Non-Profit Organisation
NS	Non-Sewered
NSS	Non-Sewered Sanitation
NSSS	Non-Sewered Sanitation System
NWRS	National Water Resource Strategy
NWSA	National Water Services Act 108 of 1997
O&M	Operation and Maintenance
PPP	Public–Private Partnership
R&D	Research and Development

SAFE	Sanitation Appropriate for Education
SABS	South African Bureau of Standards
SALGA	South African Local Government Association
SANITI	Sanitation Transformation Initiative
SANS	South African National Standard
SASTEP	South African Sanitation Technology Enterprise Programme
SDG	Sustainable Development Goal
SE	Sanitation Economy
SFD	Excreta Flow Diagram (or Shit Flow Diagram)
SSP	Sanitation Safety Plan
SSS	Simplified Sewage System
STTCC	Sanitation Technology Technical Coordination Committee
SWOT	Strengths-Weaknesses-Opportunities-Threats
TIS	Technological Innovation System
TKC	Technology Knowledge Centre
TRL	Technology Readiness Level
UN	United Nations
UNICEF	United Nations Children's Fund (originally known as the United Nations International Children's Emergency Fund)
VIP	Ventilated Improved Pit
W_2RAP	Wastewater Risk Abatement Plan
WADER	Water Technologies Demonstration Programme
WHO	World Health Organization
WPO	Water Partnership Office
WRC	Water Research Commission
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSKS	Water Services Knowledge System
WSP	Water Safety Plan
WWTW	Wastewater Treatment Works

1 Introduction: Understanding the South African sanitation landscape

1.1 Background

Why is sanitation important?

Poor sanitation has a negative impact on public health and the environment. Safe and hygienic sanitation, together with potable water supply and good hygiene practices, plays an important role in preventing waterborne illnesses.

The 2016 National Sanitation Policy (NSP) defines sanitation services as the collection, treatment, removal and/or disposal of human excreta and domestic public institution wastewater. It includes the collection, treatment and/or disposal of municipal, mining, industrial and agricultural wastewater.

Good hygiene practices, safe sanitation and potable water supply play a significant role in preventing the spread of waterborne disease and in protecting the environment. As a member of the United Nations (UN), South Africa is committed to the Sustainable Development Goals (SDGs), and for water and sanitation, Goal 6 is particularly important (see box below). The South African National Development Plan (NDP) corresponds with the SDG target for the establishment of improved sanitation by 2030.

Notable targets under SDG 6 (for achievement by 2030) include the following:

- 6.1 Achieve universal and equitable access to safe and affordable drinking water for all.
- 6.2 Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.
- 6.3 Improve water quality by reducing pollution, eliminating dumping and minimising the release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
- 6.4 Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.
- 6.8 Support and strengthen the participation of local communities in improving water and sanitation management.

To help achieve these sanitation targets, the National Sanitation Integrated Plan (NSIP) was developed to guide the sanitation sector in the implementation and monitoring of sanitation services in South Africa.

In 2012, the World Health Organization (WHO) estimated that for every US$1 invested in sanitation, an average global economic return of US$5 could be anticipated. So investment in sanitation makes economic sense!

1.2 South African sanitation policy and legislative framework

What does the law say?

Access to sufficient water and decent sanitation is a basic human right in South Africa. However, despite constitutional and statutory provisions that guarantee the right to water and sanitation, much work remains to be done to ensure access to sufficient water and decent sanitation in many parts of South Africa.

Key relevant policies, legislation, frameworks, strategies and plans are noted below:

- White Paper on Water Supply and Sanitation (1994)
- **Constitution of the Republic of South Africa (1996)**
- Draft National Sanitation Policy (1996)
- White Paper on National Water Policy of South Africa (1997)
- **National Water Services Act (1997**)
- Housing Act (1997)
- **National Water Act (1998)**
- National Environmental Management Act (1998)
- Municipal Structures Act (1998)
- **Municipal Systems Act (2000)**
- **White Paper on Basic Household Sanitation (2001)**
- Strategic Framework for Water Services (2003)
- Municipal Finance Management Act (2003)
- National Sanitation Strategy (2005)
- Free Basic Sanitation Implementation Strategy (2009)
- **National Sanitation Policy (2016)**
- Draft National Norms and Standards (2017)
- **National Water and Sanitation Master Plan (2018)**
- Revised National Sanitation Framework (2022)
- Revised National Norms and Standards (2023)
- Faecal Sludge Management Strategy (2023)
- National Sanitation Integrated Plan (2024)

Key regional and international monitoring and reporting obligations are as follows:

- UN SDGs 2030
- N'gor commitments on sanitation and hygiene
- African Ministers' Council on Water (AMCOW) water and sanitation indicators
- UN/World Health Organization (WHO) Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) indicators
- WHO/United Nations Children's Fund (UNICEF) Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) indicators

The **Constitution of the Republic of South Africa (1996)** provides the right of all people in South Africa to dignity and access to an environment that is not harmful to health and well-being and that is sustainable and protected from pollution and degradation through legislative measures. Access to adequate sanitation services is important to achieve the government's goals of improved health, safety, environmental standards and dignity for all South Africans. Section 3(1) of the **National Water Services Act (Act 108 of 1997)** provides for a basic right of access to basic water supply and basic sanitation to everyone.

The Department of Water and Sanitation (DWS), as the sector leader, was at the forefront of reviewing the **White Paper on Basic Household Sanitation (2001)**, which resulted in the **National Sanitation Policy (NSP) (2016)**.

The **NSP (2016)** provides a suite of procedures, rules and allocation mechanisms for sanitation in the country that are implemented through the policy instruments of laws and regulations, economic measures, information and educational programmes, and the assignment of rights and responsibilities for providing services.

After the endorsement of the **NSP (2016)**, it became necessary to develop a plan that responds to the reviewed policy positions and new developments in sanitation locally and internationally. The **National Water and Sanitation Master Plan (2018)** calls for actions by DWS and sector partners to develop a turnaround long-term plan of sanitation services in the country.

Photo: Bernd Klutsch on Unsplash

1.3 Sanitation policy and legislation timeline

From past to present: Sanitation policy and legislation milestones

Since 1994, the sanitation landscape has changed significantly both in South Africa and internationally. The **National Water Services Act (Act 108 of 1997)** and the **National Water Act (Act 36 of 1998)** made important policy advances specifically with respect to the institutional framework, and the enactment of the **Municipal Systems Act (Act 32 of 2000)** made it possible for local government to assume full responsibility for ensuring water and sanitation services, as provided for in the Constitution.

The timeline in Figure 1-1 highlights key legislation, policies and strategies that have shaped sanitation in South Africa. Progressively, policies, strategies, plans and standards aim to create an enabling environment to drive the necessary changes within the sanitation sector.

FIGURE 1-1: KEY SANITATION POLICY AND LEGISLATION TIMELINE

The NSIP is the long-term turnaround plan of sanitation services in the country that responds to the sanitation policy positions and ongoing sanitation sector developments.

1.4 Sanitation planning in South Africa

Where does the NSIP fit in?

The implementation of sanitation is fragmented in South Africa. Hence an integrated plan and a coordinated effort are required. To meet those requirements, there is a need to understand how the NSIP fits in with other national plans, programmes and initiatives.

Plans can be distinguished from one another based on two characteristics, namely the date by which the plans' goals are to be achieved and the spheres of government that are applicable. Plans are typically underpinned by legislation. Nonetheless, they respond to external drivers that necessitate action, such as climate change.

Currently, sanitation planning is done at the level at which service provision is mandated, typically at local or district level for water services authorities (WSAs) and at provincial level for institutional service providers like the Department of Basic Education (DBE) and Department of Health (DoH).

The NSIP seeks to influence the current sanitation planning instruments, such as to achieve coordinated effort by different sanitation service providers across the spheres of government.

The NSIP provides a roadmap for the sector, firstly on actions required to address key sector challenges and secondly on actions appropriate for different sector participants. Each sector participant is called to adopt the actions that are applicable and to incorporate them into their current planning instruments.

To assess progress, the actions adopted and implemented by sector participants will be monitored.

Figure 1-2 illustrates how the NSIP seeks to influence the current sanitation planning instruments for WSAs.

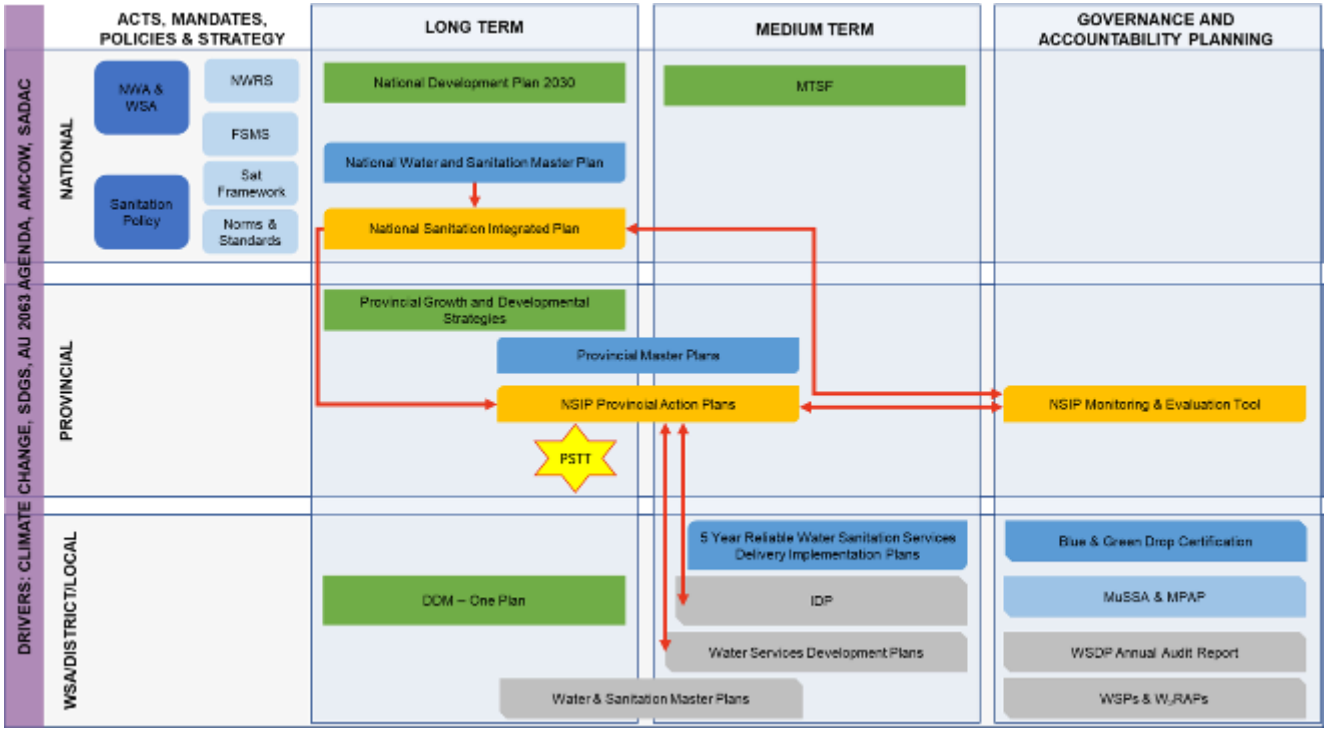


FIGURE 1-2: INTEGRATION OF THE NSIP WITH EXISTING SANITATION PLANNING INSTRUMENTS

1.5 Sanitation delivery

A high-level outline of the current sanitation delivery model

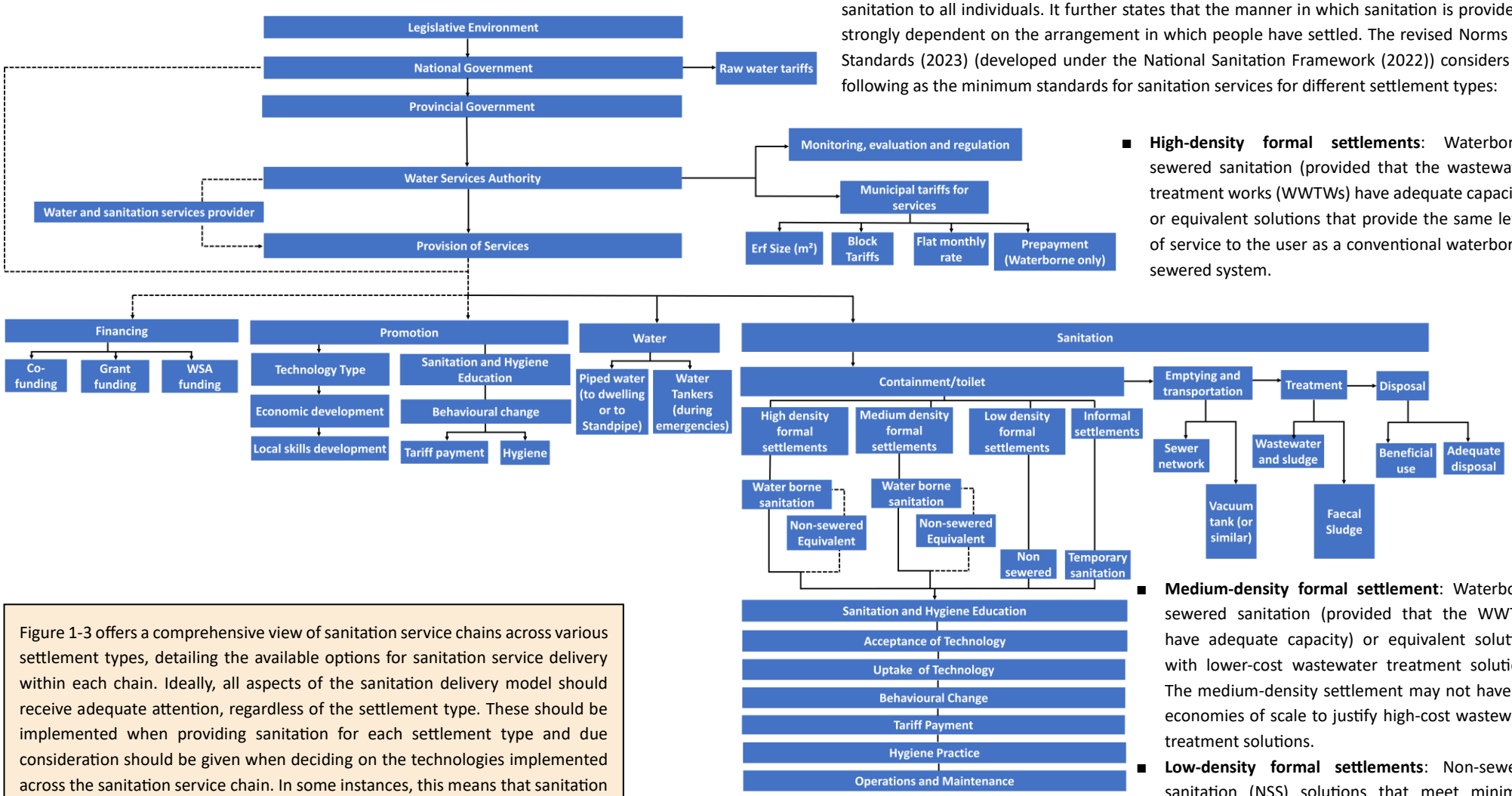


Figure 1-3 offers a comprehensive view of sanitation service chains across various settlement types, detailing the available options for sanitation service delivery within each chain. Ideally, all aspects of the sanitation delivery model should receive adequate attention, regardless of the settlement type. These should be implemented when providing sanitation for each settlement type and due consideration should be given when deciding on the technologies implemented across the sanitation service chain. In some instances, this means that sanitation may need to be provided as part of a package of municipal services associated with housing, including water and roads.

FIGURE 1-3: SANITATION SERVICE CHAINS ACROSS VARIOUS SETTLEMENT TYPES

The NSP of 2016 states that the government of South Africa intends to provide at least basic sanitation to all individuals. It further states that the manner in which sanitation is provided is strongly dependent on the arrangement in which people have settled. The revised Norms and Standards (2023) (developed under the National Sanitation Framework (2022)) considers the following as the minimum standards for sanitation services for different settlement types:

- **High-density formal settlements**: Waterborne sewered sanitation (provided that the wastewater treatment works (WWTWs) have adequate capacity) or equivalent solutions that provide the same level of service to the user as a conventional waterborne sewered system.
- **Medium-density formal settlement**: Waterborne sewered sanitation (provided that the WWTWs have adequate capacity) or equivalent solutions with lower-cost wastewater treatment solutions. The medium-density settlement may not have the economies of scale to justify high-cost wastewater treatment solutions.
- **Low-density formal settlements**: Non-sewered sanitation (NSS) solutions that meet minimum standards set by recognised institutions.
- **Informal settlements**: Interim sanitation services that meet minimum standards set by recognised institutions.

1.6 Sanitation service providers and responsibilities

Who is responsible for sanitation services?

Whilst WSAs (municipalities) provide sanitation at household level, other institutions are responsible for sanitation service delivery at hospitals, clinics, schools, correctional facilities, etc.

- **Department of Water and Sanitation (DWS)**: Responsible for overseeing the protection, management, use, development, conservation and control of the country's water resources by regulating and supporting the delivery of effective water supply and sanitation.
- **Department of Health (DoH)**: Responsible for developing health-related policies and strategies, establishing regulatory frameworks, monitoring health trends, and planning and providing adequate sanitation infrastructure for hospitals and clinics. DoH has also established the Ideal Clinic programme to evaluate the status of clinics, including the status of infrastructure, staff, administrative processes, etc. The Ideal Clinic programme is a good monitoring and evaluation platform that could be expanded to include additional sanitation-related criteria and performance indicators.
- **Department of Basic Education (DBE)**: Responsible for providing and maintaining infrastructure at schools, including water and sanitation services. The Sanitation Appropriate for Education (SAFE) programme aims to provide safe and appropriate sanitation facilities for schools, especially those that have only pit latrines or other inadequate sanitation. The programme aims to replace basic pit toilets with toilets that meet the norms and standards for school infrastructure, and to ensure that the number of toilet seats is determined by the learner enrolment. The programme was launched by President Cyril Ramaphosa in 2018, following the tragic deaths of two learners who drowned in pit latrines in Limpopo and the Eastern Cape. Currently, 2 814 schools are part of the SAFE programme. The DBE said that the upgrading of sanitation had been completed at 1 564 schools as of 2 March 2022.
- **Department of Public Works and Infrastructure (DPWI)**: Responsible for the development and maintenance of sanitation infrastructure at correctional facilities, border posts, police stations, and military bases. DPWI currently participates in the DWS Green Drop certification programme. In the most recent 2022 Green Drop certification audits, 12 DPWI regions and 115 systems were audited. Although five of the 12 regions had improved, the remaining seven had regressed. No Green Drop certifications were received, and 102 systems were categorised as being in a critical state. The Green Drop report (DWS, 2022a) noted that the full range of Green Drop key performance areas (KPAs) required attention from all the DPWI regions, without any exceptions. This indicates that there is still much work to be done.
- **Department of Human Settlements (DHS)**: Responsible for overseeing spatial development and housing and providing water and sanitation services when housing is developed. The DHS has a national upgrading support programme to assist provinces and municipalities in planning for the upgrading of informal settlements. Informal settlements are areas where people live in substandard housing conditions without legal land tenure or access to basic services. In South Africa, there are more than 2 700 informal settlements, mostly located in unsuitable areas that are prone to disaster.

Government Immovable Asset Management Act (GIAMA) (2007) and local government responsibilities

The GIAMA defines the responsibilities of custodians and users of immovable assets in national and provincial governments but does not explicitly cover local government entities such as WSAs. WSAs, part of local government, manage their own immovable assets under local regulations unless an agreement with national or provincial custodians exists. These agreements clarify responsibilities when WSAs use assets owned by higher levels of government. Thus, while the Act focuses on national and provincial levels, WSAs remain responsible for their assets, needing specific agreements for assets used from other government levels.

The NSIP has been an ideal opportunity to review the status quo and renew relationships between DWS and the above-mentioned institutions. NSIP implementation will aim to continue to further foster and grow these relationships, thereby strengthening the sanitation sector in South Africa. The provincial sanitation task teams will continue to use meetings in driving this process.

1.7 Key sanitation sector stakeholders

Moving together as one in the same direction to improve sanitation

Participation involving representatives of key stakeholders has important advantages, including obtaining varied perspectives, gaining buy-in and support, and ultimately increasing the likelihood of implementing an appropriate NSIP. Key sanitation sector stakeholders include the following:

water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Water and sanitation services sector leader; involved in policy development and regulation; ongoing liaison and collaboration with other key departments; monitoring and reporting on the progress of national water services; health and hygiene user education.

Water service providers

Responsible for provision of water and sanitation services; including municipalities, water boards, etc.

cooperative governance & traditional affairs
Department:
Cooperative Governance and Traditional Affairs
REPUBLIC OF SOUTH AFRICA

Oversee the implementation of the basic services projects and allocation of funds; monitor WSA performance

Water services authorities

WSAs work closely with DWS, CoGTA, and Health Practitioners in the district municipalities. Responsible for ensuring access to safely managed water and sanitation (144 WSAs including metro, district and local municipalities).

health
Department:
Health
REPUBLIC OF SOUTH AFRICA

Develop policy and strategy; establish regulatory frameworks; monitor health trends; planning and providing adequate sanitation infrastructure for hospitals and clinics

basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

Providing and maintaining infrastructure at schools, including water and sanitation services

human settlements
Department:
Human Settlements
REPUBLIC OF SOUTH AFRICA

Responsible for spatial development and housing, and providing water and sanitation services when developing housing

SOUTH AFRICAN LOCAL GOVERNMENT ASSOCIATION
SALGA
Inspiring service delivery

An advocacy body that lobbies for local government and guides municipalities in delivering water and sanitation services

R&D facilities

Research and development of innovative sanitation technologies and processes

WATER RESEARCH COMMISSION

wader
WATER TECHNOLOGIES DEMONSTRATION PROGRAMME
A KEYSTONE FOR WATER TECHNOLOGY INNOVATION

SASTEP
South African Sanitation Technology Enterprise Programme

Generate new knowledge and promote water and sanitation research, development and implementation

NGOs, donors

Improvement projects, creating awareness programmes on health and hygiene user education

forestry, fisheries & the environment
Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Development of policies and guidelines on sanitation impact; monitoring environmental impacts of sanitation systems; monitoring compliance with environmental management procedures and guidelines

public works & infrastructure
Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

Development and maintenance of sanitation infrastructure at correctional facilities, border posts, police stations, and military bases

national treasury
Department:
National Treasury
REPUBLIC OF SOUTH AFRICA

Funding different departments and spheres of government; allocation of equitable share and various grants to Provinces and municipalities

transport
Department:
Transport
REPUBLIC OF SOUTH AFRICA

Concerned with transport and regulating licensing the transport of faecal matter

MISA
MUNICIPAL INFRASTRUCTURE SUPPORT AGENT

Provide support and develop technical capacity towards sustained accelerated municipal infrastructure and service delivery

DBSA
DEVELOPMENT BANK OF SOUTHERN AFRICA
Building Africa's Prosperity

Promote economic growth and regional integration for sustainable development projects and programmes in South Africa, the Southern African Development Community (SADC) and the wider Sub-Saharan Africa

Private sector

Planning, design and construction of sanitation infrastructure

1.8 Sanitation approaches and challenges

As South Africa transitions from the paradigm of a binary sanitation system to equitable sanitation systems appropriate for different settlement types, several challenges will remain ubiquitous. These challenges, in their different manifestations (as described in Figure 1-4), pose the greatest threat to achieving the goals set out in this plan.

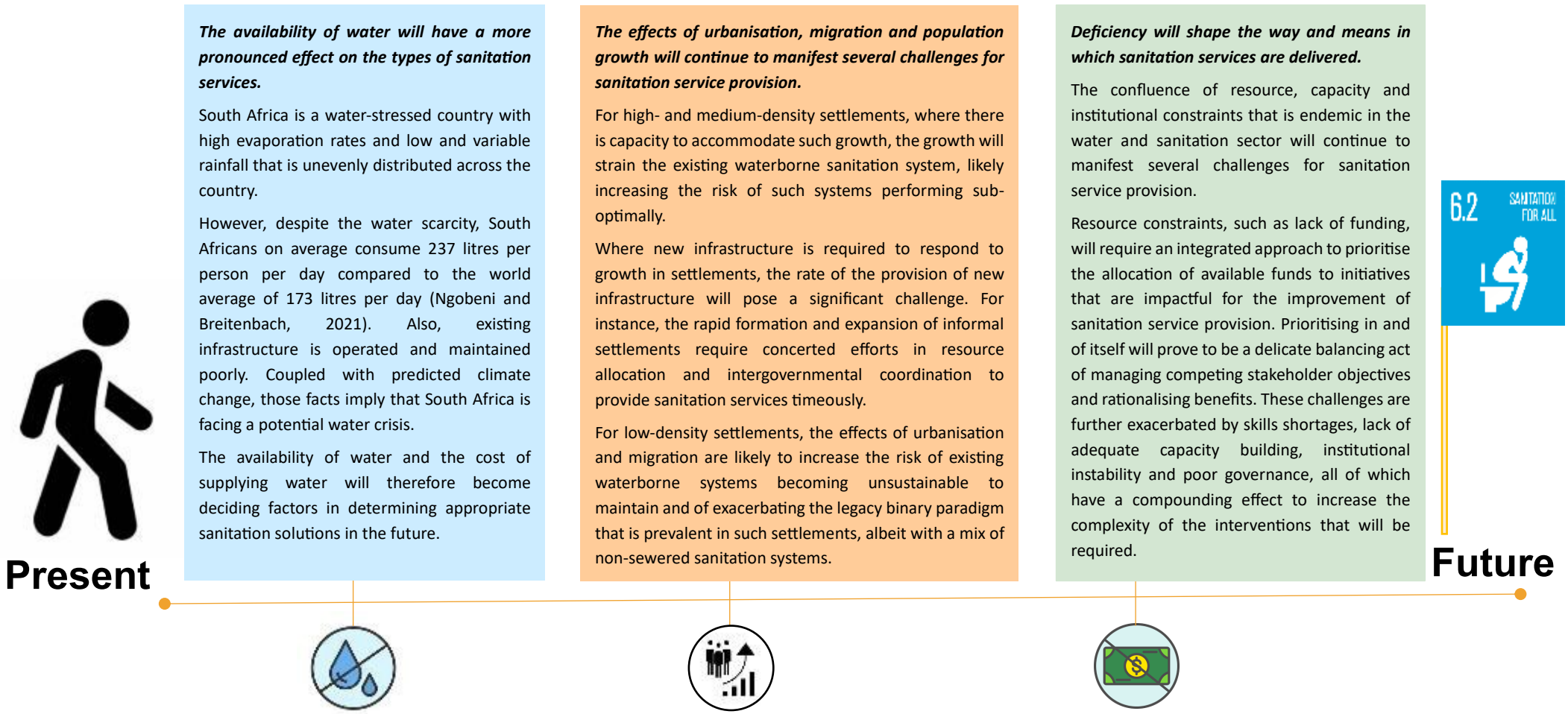


FIGURE 1-4: KEY SANITATION CHALLENGES THREATENING THE ACHIEVEMENT OF THE NSIP GOALS

2 Situational analysis: South Africa

Section 2 provides a summary of data and findings from the **National Situational Analysis** report. For access to the full report, scan the QR code above.

What is the current reality?

2.1 South Africa overview

Provinces and municipalities

South Africa comprises various administrative divisions, including nine provinces, eight metropolitan municipalities, 44 district municipalities, 205 local municipalities and 144 water services authorities, as depicted in Figure 2-1 and Table 2-1.

FIGURE 2-1: PROVINCES OF SOUTH AFRICA

TABLE 2-1: PROVINCES, MUNICIPALITIES AND WATER SERVICES AUTHORITIES

Provinces	Metropolitan Municipalities	District Municipalities	Local Municipalities	Water Services Authorities
Eastern Cape	2	6	31	14
Free State	1	4	18	19
Gauteng	3	2	6	9
KwaZulu-Natal	1	10	43	14
Limpopo		5	22	10
Mpumalanga		3	17	17
Northern Cape		5	26	26
North West		4	18	10
Western Cape	1	5	24	25
South Africa	**8**	**44**	**205**	**144**

2.2 Access to sanitation: Households

Sanitation service levels per household: A national view

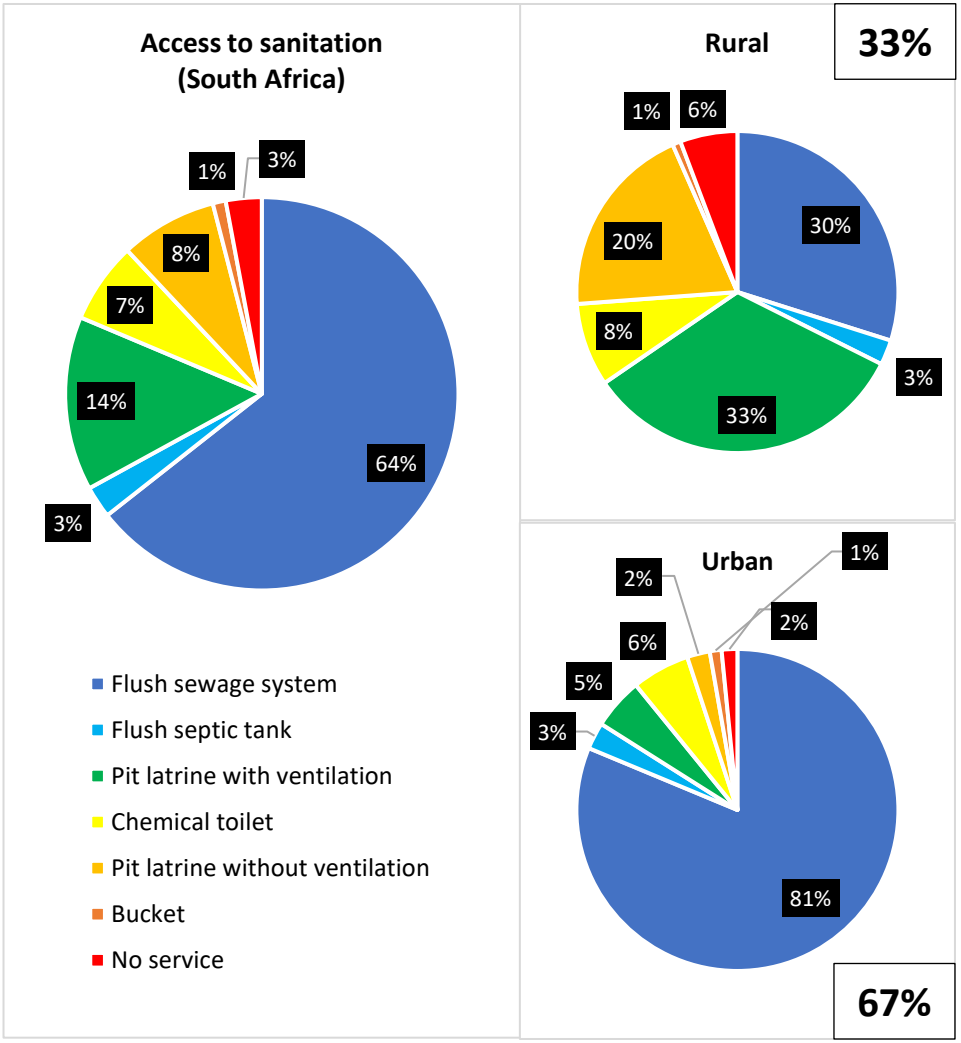


FIGURE 2-2: SANITATION SERVICE LEVELS PER HOUSEHOLD IN SOUTH AFRICA

An analysis of sanitation provision by settlement type (see Figure 2-2, Figure 2-3, and Table 2-2) depicts a total number of 19 592 658 households in South Africa of which 6 438 524 (33%) are rural settlements and 13 154 134 (67%) urban settlements (DWS, 2022b).

The data shows that nationally:

- **64%** of households have access to a flush toilet connected to the sewage system.
- **3%** of households do not have access to sanitation (implying open defecation).
- The remaining **33%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (14%), chemical toilets (7%), pit latrines without ventilation (8%) and bucket latrines (1%).

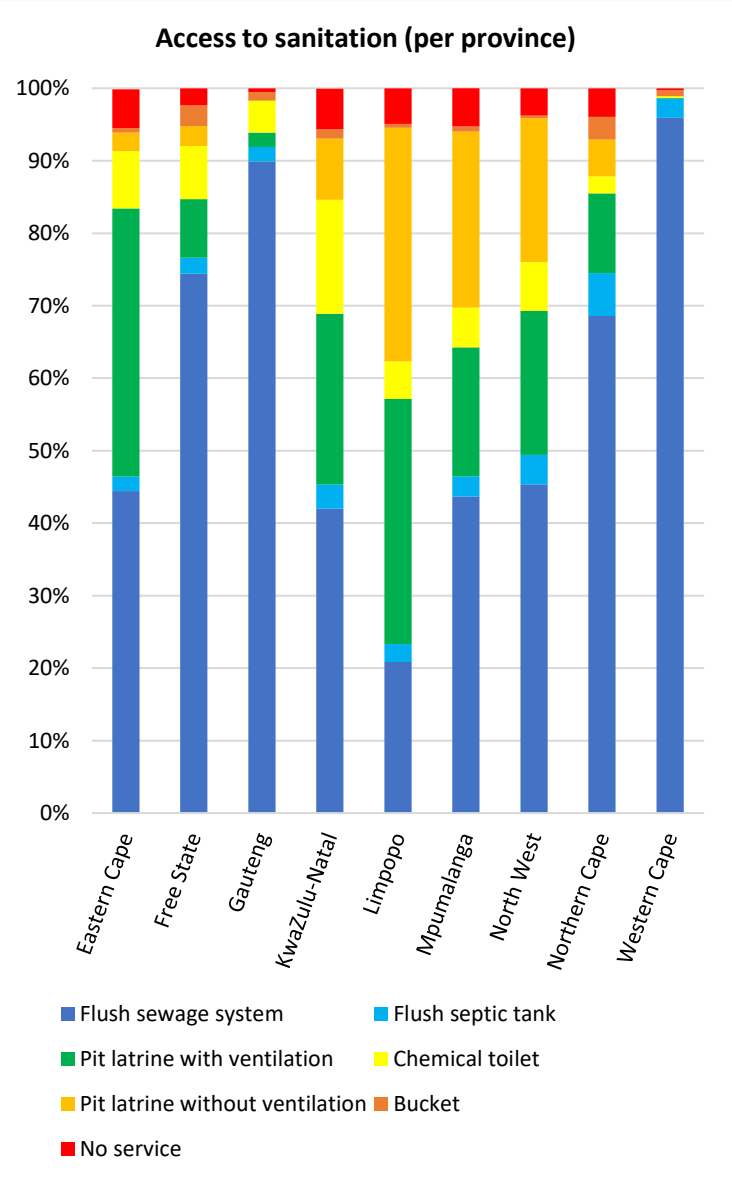
In rural settlements:

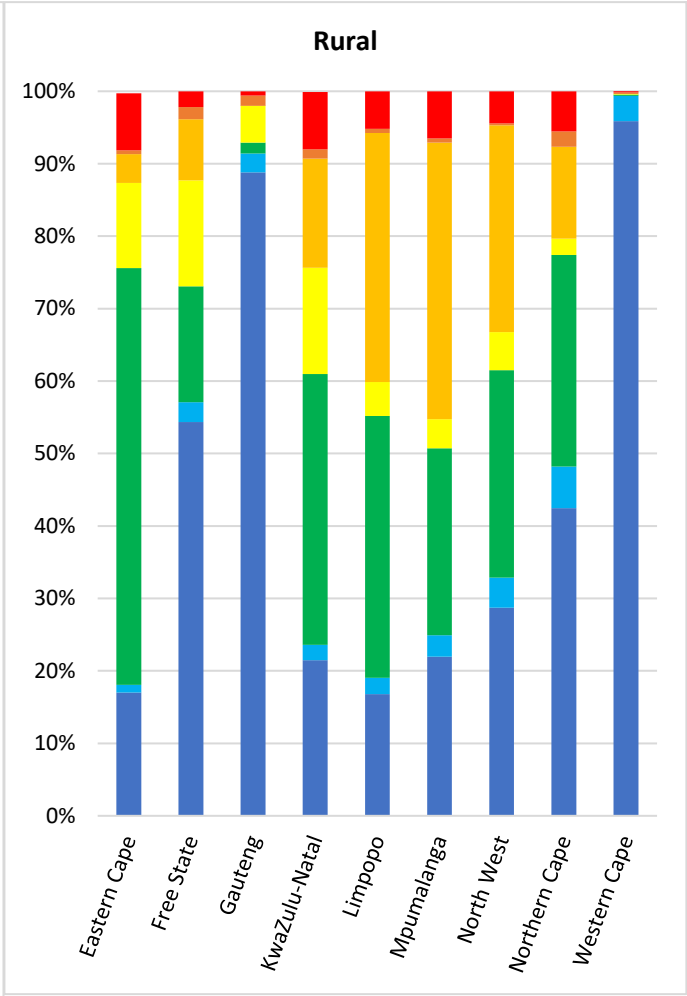
- **30%** of households have access to a flush toilet connected to the sewage system.
- **6%** of households do not have access to sanitation (implying open defecation).
- The remaining **64%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (33%), chemical toilets (8%), pit latrines without ventilation (20%) and bucket latrines (1%).

In urban settlements:

- **81%** of households have access to a flush toilet connected to the sewage system.
- **2%** of households do not have access to sanitation (implying open defecation).
- The remaining **17%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (5%), chemical toilets (6%), pit latrines without ventilation (2%) and bucket latrines (1%).

A significant proportion of the households in South Africa are reliant on on-site sanitation (especially in rural areas), presenting a huge opportunity to treat faecal sludge (FS). In urban settlements, on the other hand, high percentages of flush sewage systems present the opportunity to re-use treated effluent.





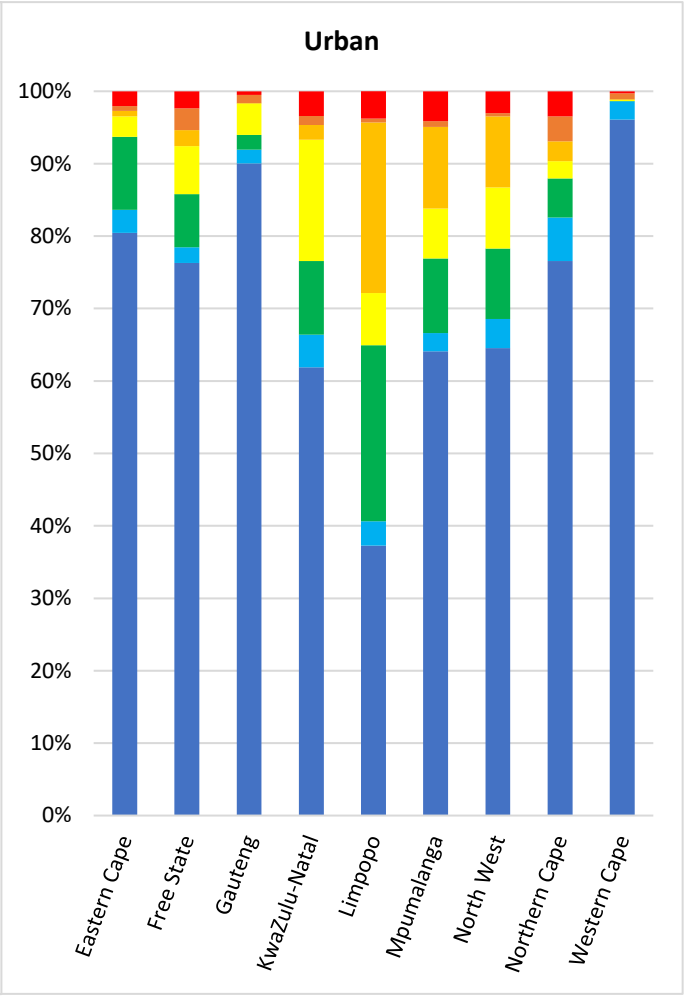


FIGURE 2-3: SANITATION SERVICE LEVELS PER HOUSEHOLD IN NINE PROVINCES

For provinces:

- More than half of the urban households have access to waterborne sanitation, except for the Limpopo province.
- More than half of rural households have access to on-site sanitation systems, except for households in the Free State, Gauteng and Western Cape provinces.

NOTE: For municipal level data, refer to chapters 3 to 11.

(DWS WSKS) (April 2023)

TABLE 2-2: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN NINE PROVINCES

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Eastern Cape	1 739 977		773 388	44	34 462	2	643 968	37	137 215	8	44 746	3	10 293	1	93 007	5
Rural	987 113	57	167 840	17	10 432	1	568 045	58	116 010	12	39 108	4	5 170	1	77 670	8
Urban	752 864	43	605 548	80	24 030	3	75 923	10	21 205	3	5 638	1	5 123	1	15 337	2
Free State	1 052 716		783 403	74	23 011	2	85 327	8	77 059	7	28 861	3	30 245	3	24 803	2
Rural	91 109	9	49 523	54	2 506	3	14 543	16	13 327	15	7 679	8	1 544	2	1 973	2
Urban	961 607	91	733 880	76	20 505	2	70 784	7	63 732	7	21 182	2	28 701	3	22 830	2
Gauteng	6 241 813		5 612 794	90	122 394	2	125 042	2	276 462	4	471	0	72 024	1	32 497	1
Rural	603 275	10	535 769	89	15 695	3	9 003	1	30 640	5	144	0	8 561	1	3 432	1
Urban	5 638 538	90	5 077 025	90	106 699	2	116 039	2	245 822	4	327	0	63 463	1	29 065	1
KwaZulu-Natal	3 385 198		1 421 096	42	112 725	3	798 251	24	532 341	16	286 151	9	42 683	1	190 559	6
Rural	1 668 276	49	358 354	21	35 503	2	623 542	37	244 696	15	251 114	15	21 637	1	132 042	8
Urban	1 716 922	51	1 062 742	62	77 222	4	174 709	10	287 645	17	35 037	2	21 046	1	58 517	3
Limpopo	1 602 607		334 213	21	39 677	3	541 611	34	83 073	5	516 473	32	8 722	1	78 585	5
Rural	1 285 481	80	215 952	17	29 048	2	464 594	36	60 180	5	441 807	34	7 014	1	66 624	5
Urban	317 126	20	118 261	37	10 629	3	77 017	24	22 893	7	74 666	24	1 708	1	11 961	4
Mpumalanga	1 506 471		658 218	44	41 353	3	268 242	18	82 868	6	365 665	24	10 453	1	79 679	5
Rural	729 124	48	160 084	22	21 709	3	188 186	26	29 081	4	278 351	38	4 243	1	47 476	7
Urban	777 347	52	498 134	64	19 644	3	80 056	10	53 787	7	87 314	11	6 210	1	32 203	4
North West	1 512 417		686 095	45	61 620	4	300 372	20	101 718	7	300 222	20	5 274	0	57 006	4
Rural	810 200	54	232 862	29	33 361	4	232 172	29	42 344	5	231 428	29	2 219	0	35 711	4
Urban	702 217	46	453 233	65	28 259	4	68 200	10	59 374	8	68 794	10	3 055	0	21 295	3
Northern Cape	375 542		257 556	69	22 310	6	41 194	11	8 773	2	19 151	5	11 740	3	14 765	4
Rural	87 921	23	37 344	42	5 039	6	25 688	29	1 958	2	11 156	13	1 851	2	4 868	6
Urban	287 621	77	220 212	77	17 271	6	15 506	5	6 815	2	7 995	3	9 889	3	9 897	3
Western Cape	2 175 917		2 086 776	96	58 131	3	1 717	0	5 259	0	205	0	17 311	1	6 459	0
Rural	176 025	8	164 894	94	8 225	5	532	0	450	0	74	0	888	1	928	1
Urban	1 999 892	92	1 921 882	96	49 906	2	1 185	0	4 809	0	131	0	16 423	1	5 531	0
South Africa	**19 592 658**		**12 613 539**	**64**	**515 683**	**3**	**2 805 724**	**14**	**1 304 768**	**7**	**1 561 945**	**8**	**208 745**	**1**	**577 360**	**3**
Rural	**6 438 524**	**33**	**1 922 622**	**30**	**161 518**	**3**	**2 126 305**	**33**	**538 686**	**8**	**1 260 861**	**20**	**53 127**	**1**	**370 724**	**6**
Urban	**13 154 134**	**67**	**10 690 917**	**81**	**354 165**	**3**	**679 419**	**5**	**766 082**	**6**	**301 084**	**2**	**155 618**	**1**	**206 636**	**2**

2.3 Bucket and chemical toilets in South Africa

Are bucket toilets still used?

Bucket toilets should have already been eradicated in South Africa. Yet, as of 2023, there are still more than 208 000 households using bucket toilets (DWS, 2023b), as illustrated in Figure 2-4.

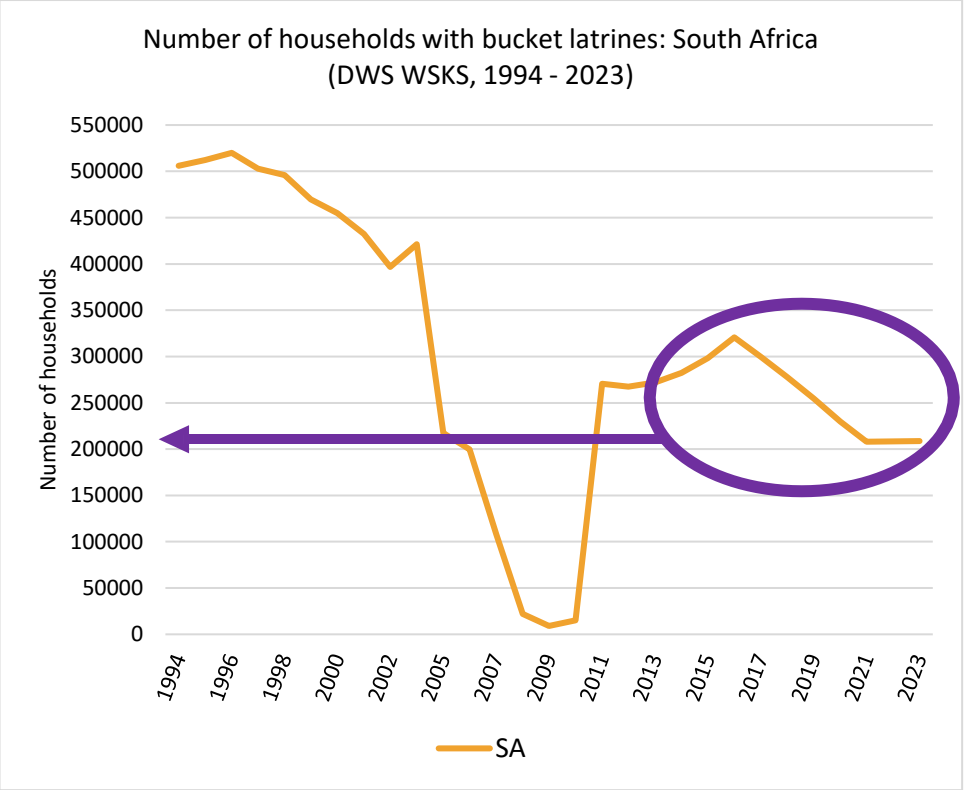


FIGURE 2-4: NUMBER OF HOUSEHOLDS WITH BUCKET LATRINES IN SOUTH AFRICA FROM 1994 TO 2023

As depicted in Figure 2-5, Gauteng has the highest number of households using bucket toilets (72 024), followed by KwaZulu-Natal with 42 683 and the Free State with 30 245 households. The other provinces report lower figures, with North West having the fewest at 5 274 households using bucket toilets. This highlights the ongoing sanitation challenges faced by many regions in the country.

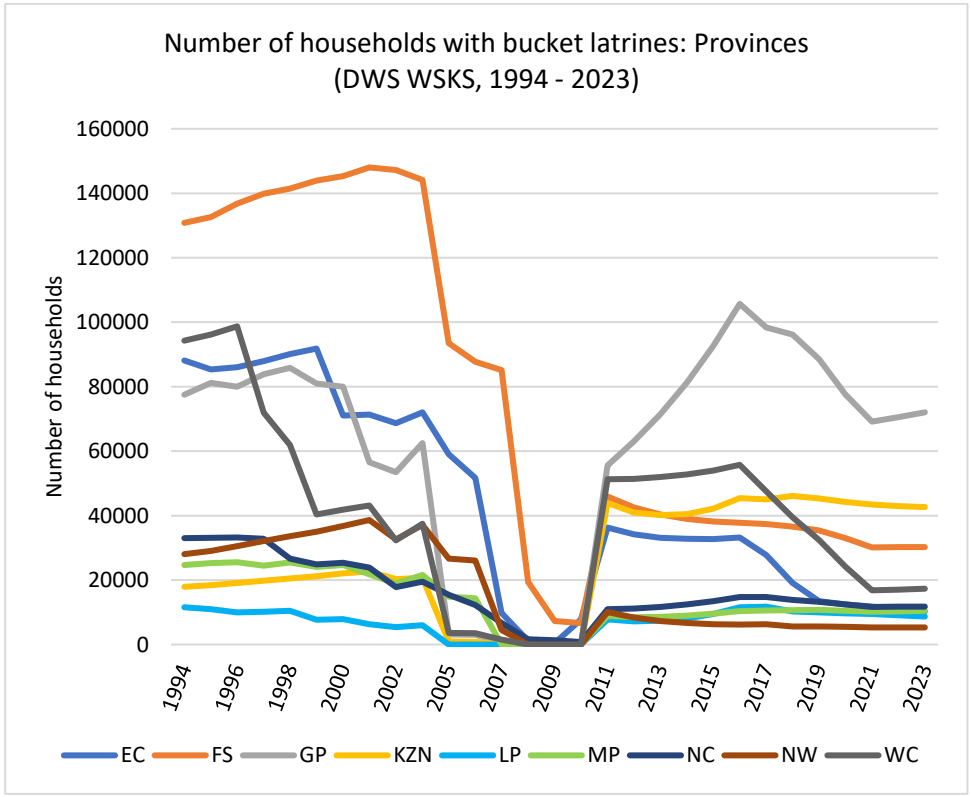


FIGURE 2-5: NUMBER OF HOUSEHOLDS WITH BUCKET LATRINES IN THE NINE PROVINCES FROM 1994 TO 2023

Are chemical toilets an issue?

As of 2023, more than 1 300 000 households are served by chemical toilets in South Africa (DWS, 2023b), as illustrated in Figure 2-6.

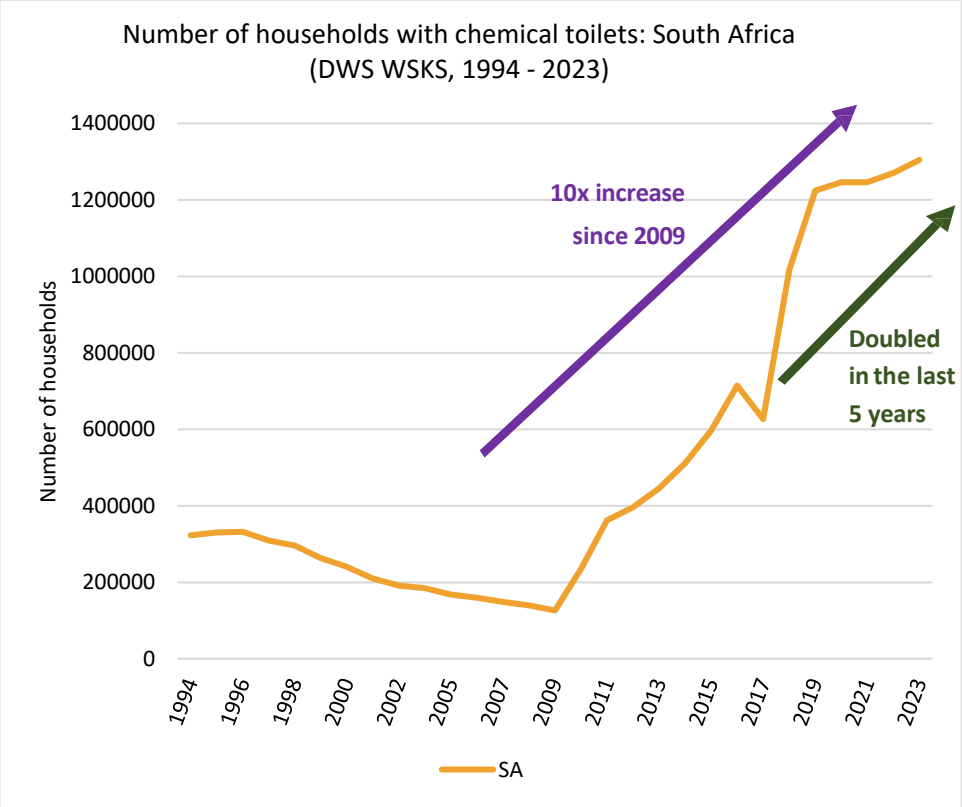


FIGURE 2-6: NUMBER OF HOUSEHOLDS WITH CHEMICAL TOILETS IN SOUTH AFRICA FROM 1994 TO 2023

Assuming 2.5 households are served per chemical toilet (i.e. ~10 people per toilet, ~520 000 chemical toilets in operation), and chemical toilet rental costs of R750/month, this equates to a cost of **~R390 million/month** or **~R4.6 billion/year**.

Could innovative sanitation alternatives meet the same needs (or perform even better) at a lower cost?

As depicted in Figure 2-7, KwaZulu-Natal has the highest number of households served by chemical toilets (532 341), followed by Gauteng with 276 462 and Eastern Cape with 137 215 households. The other provinces report lower figures, with the Western Cape having the fewest at 5 259 households with bucket latrines. This highlights the reliance on chemical toilets in many areas.

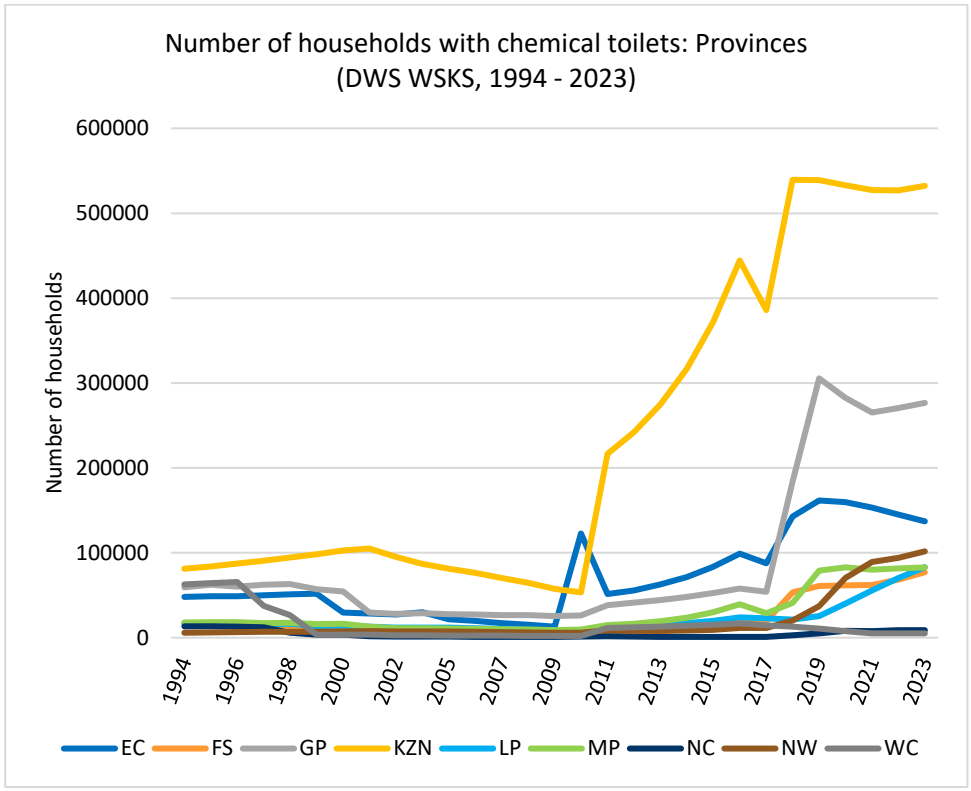


FIGURE 2-7: NUMBER OF HOUSEHOLDS WITH CHEMICAL TOILETS IN THE NINE PROVINCES FROM 1994 TO 2023

2.4 Access to sanitation: Schools

Sanitation facilities at schools

According to the National Education Infrastructure Management System (NEIMS) (2021) database, South Africa has 23 276 school sites. At some school sites, multiple types of sanitation systems are implemented (i.e. a site might have both a VIP and a pit toilet). Among these sites, 8 643 have sewered flush toilets, 3 152 have flush toilets connected to septic tanks, 7 610 have VIPs and 2 672 have Enviro Loos. There are 5 167 schools with pit latrines (without ventilation), while the balance of 295 have other types of sanitation facilities implemented (including mobile toilets and chemical toilets). Figure 2-8 and Table 2-3 contain details on sanitation facilities in the nine provinces.

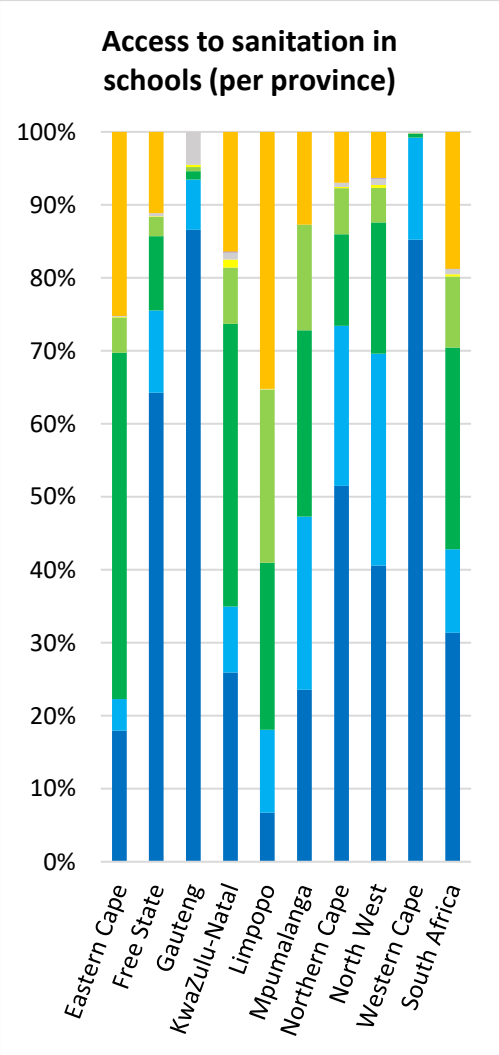


FIGURE 2-8: ACCESS TO SANITATION IN SCHOOLS IN THE NINE PROVINCES

TABLE 2-3: TYPES OF SANITATION SYSTEMS IMPLEMENTED AT SCHOOLS IN THE NINE PROVINCES

Province	Total	Flush sewage	%	Flush septic tank	%	Pit latrine with ventilation	%	Enviro Loo	%	Chemical toilet	%	Mobile toilet	%	Alternative sanitation	%	Pit latrine without ventilation	%	No facilities	%
Eastern Cape	5 843	1 048	18	254	4	2 773	47	282	5	4	0	8	0	1	0	1 473	25	0	0
Free State	1 141	733	64	129	11	116	10	30	3	1	0	5	0	0	0	127	11	0	0
Gauteng	2 246	1 945	87	154	7	26	1	13	1	7	0	101	4	0	0	0	0	0	0
KwaZulu-Natal	6 097	1 582	26	551	9	2 360	39	472	8	65	1	63	1	4	0	1 000	16	0	0
Limpopo	6 088	410	7	690	11	1 395	23	1 445	24	3	0	1	0	0	0	2 144	35	0	0
Mpumalanga	2 114	498	24	502	24	539	25	306	14	0	0	0	0	0	0	269	13	0	0
Northern Cape	662	341	52	145	22	83	13	42	6	1	0	4	1	0	0	46	7	0	0
North West	1 718	697	41	499	29	309	18	81	5	7	0	16	1	1	0	108	6	0	0
Western Cape	1 630	1 389	85	228	14	9	1	1	0	0	0	3	0	0	0	0	0	0	0
South Africa	**27 539**	**8 643**	**31**	**3 152**	**11**	**7 610**	**28**	**2 672**	**10**	**88**	**0**	**201**	**1**	**6**	**0**	**5 167**	**19**	**0**	**0**

Schools serviced by pit latrines (without ventilation) only

Although all schools in South Africa have some form of sanitation facility, some of these facilities do not meet minimum requirements. Nationally, 9% of schools have only pit latrines (without ventilation), which is regarded as inadequate form of sanitation in South Africa. Figure 2-8 and Table 2-4 detail the number and percentage of schools in the nine provinces serviced by pit latrines (without ventilation) only.

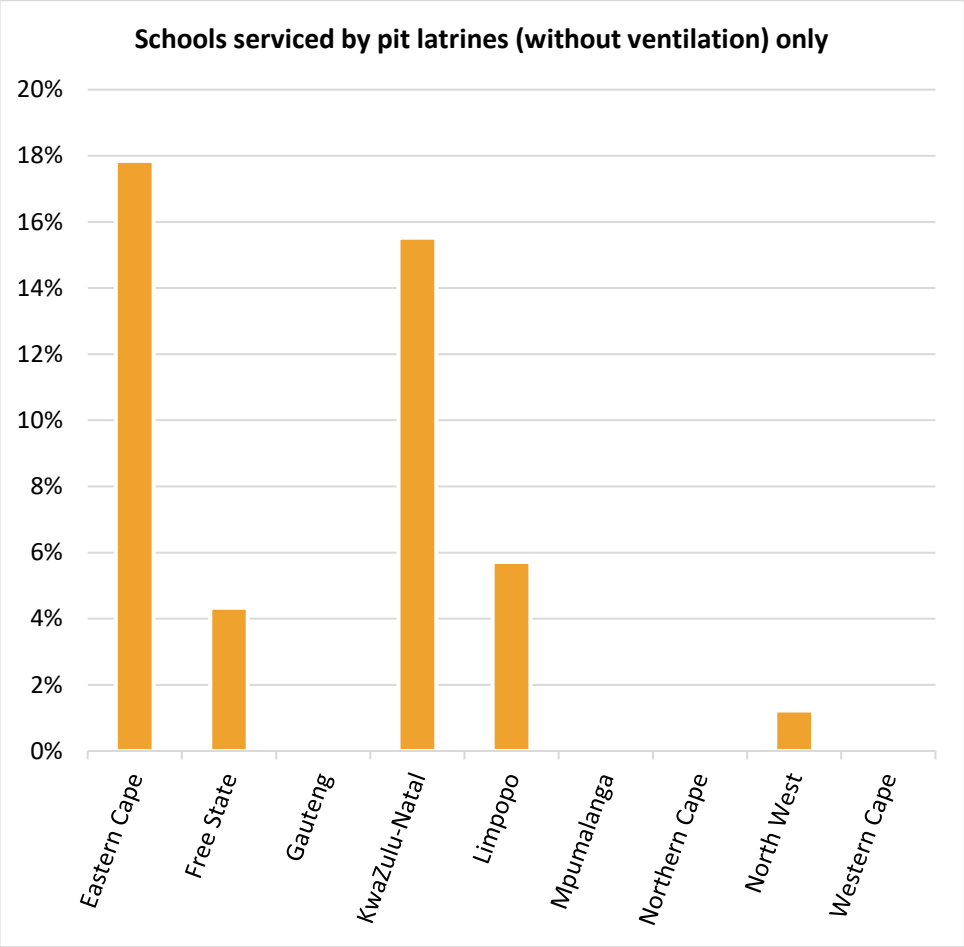


FIGURE 2-9: PERCENTAGE OF SCHOOLS IN THE NINE PROVINCES SERVICED BY PIT LATRINES (WITHOUT VENTILATION) ONLY

TABLE 2-4: NUMBER AND PERCENTAGE OF SCHOOLS IN THE NINE PROVINCES SERVICED BY PIT LATRINES (WITHOUT VENTILATION) ONLY

Province	Sites	Only pit toilet		No facilities	
		Sites	%	Sites	%
Eastern Cape	5 291	944	18	0	0
Free State	1 084	47	4	0	0
Gauteng	2 074	0	0	0	0
KwaZulu-Natal	5 803	901	16	0	0
Limpopo	3 834	219	6	0	0
Mpumalanga	1 718	1	0	0	0
Northern Cape	544	0	0	0	0
North West	1 471	18	1	0	0
Western Cape	1 457	0	0	0	0
South Africa	**23 276**	**2 130**	**9**	**0**	**0**

2.5 Sanitation backlog

What is considered as sanitation backlog?

The following sanitation types are considered appropriate within the South African context:

- Flush toilet (connected to sewage system)
- Flush toilet (with septic tank)
- Pit latrine with ventilation (VIP)

The following sanitation types are considered inappropriate and therefore regarded as a backlog:

- Chemical toilets – Due to the high running costs, the use of portable chemical toilets is discouraged, except in emergency situations (and then only for short periods).
- Pit latrines without ventilation – Pit latrines without ventilation provide no barrier against flies and have other defects usually related to the quality of their construction.
- Bucket latrines – Bucket latrines provide inadequate sanitation and are socially unacceptable to most people.

Considering the above and the DWS Water Services Knowledge System (DWS, 2023b) data captured in Section 2.2, the number of households in South Africa with inappropriate sanitation infrastructure is estimated to be 3 075 458 households (16%). If the number of households with no sanitation systems (implying open defecation) is added to this, the overall sanitation backlog for South Africa is 3 652 818 households (19%). This implies that the access to basic sanitation in South Africa is 81%.

NOTE: For municipal level data, refer to the specific provincial data in chapters 3 to 11.

Provinces with a significant overall backlog (i.e. no sanitation systems or inappropriate sanitation systems) include Limpopo (43%), Mpumalanga (36%), KwaZulu-Natal (31%) and North West (31%). The Western Cape is tracking well in the eradication of backlogs, with a low backlog of 1%. Figure 2-11 shows the percentage of appropriate, inappropriate and unacceptable sanitation per province and for South Africa.

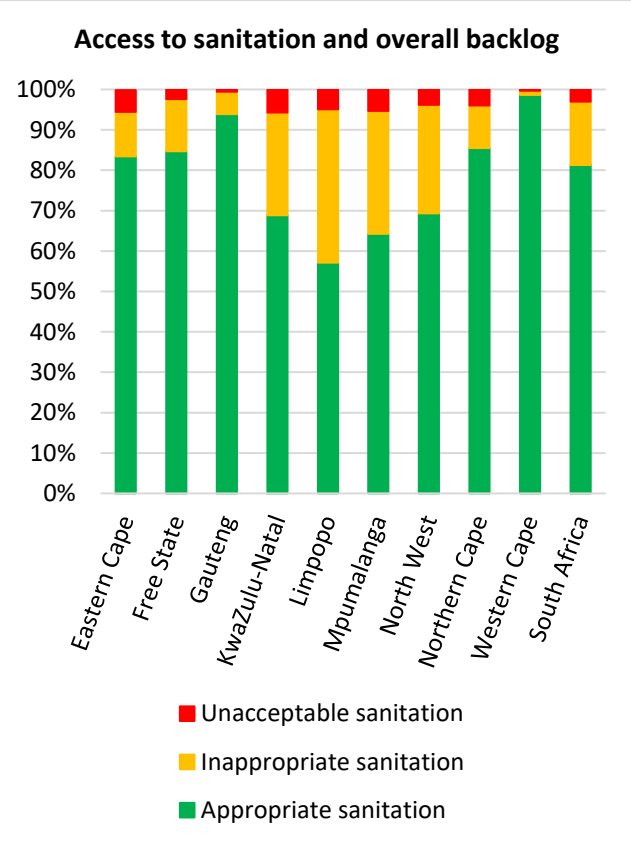


FIGURE 2-10: ACCESS TO SANITATION AND OVERALL BACKLOG IN THE NINE PROVINCES AND SOUTH AFRICA

TABLE 2-5: INTERNATIONALLY ACCEPTED AND GENERAL TERMINOLOGY

Internationally accepted terminology:	General terminology:
No sanitation facilities (WHO/UNICEF JMP): ■ No facilities/bush/field (open defecation) ■ Pit latrine without slab	Unacceptable sanitation: ■ No service
Unimproved sanitation facilities (WHO/UNICEF JMP): ■ Flush and pour flush toilet discharged to elsewhere (not a pit, septic tank, or sewer) ■ Pit latrine without slab ■ Bucket latrines ■ Hanging toilet or latrine	Inappropriate sanitation: ■ Chemical toilet (short term only) ■ Pit latrine without ventilation ■ Bucket toilet
Improved sanitation facilities (WHO/UNICEF JMP): ■ Flush toilet ■ Connection to a piped sewer system ■ Connection to a septic system ■ Flush and pour-flush to a pit latrine ■ Pit latrine with slab ■ Ventilated improved pit (VIP) latrine ■ Composting toilet	Appropriate sanitation: ■ Flush toilet to sewer ■ Flush toilet to septic tank ■ Ventilated improved pit (VIP) latrine

Open defecation refers to the practice where people do not use toilets but defecate in fields, bushes, forests, streets, open bodies of water, or other open spaces.

2.6 Progress on eradicating sanitation backlog

Is South Africa on target to eradicate sanitation backlogs?

Using the General Household Survey data, DWS used key indicators to determine the extent to which WSAs in South Africa will be able to eradicate the previously noted backlog and achieve universal access by 2030 (i.e. as of 2022, there are eight years to achieve this goal by 2030).

Figure 2-11 clearly indicates that, when considering the current rate of sanitation service delivery, some WSAs in the nine provinces have a good chance of eradicating their backlog and meeting SDG 6 by 2030 (indicated in green). It is important that these municipalities be supported so that they can continue to make advancements in addressing the noted sanitation backlog. However, some WSAs are not addressing their backlog quickly enough, and without any urgent intervention, are unlikely to meet SDG 6 by 2030 (indicated in red).

Importantly, the calculations above do not consider the additional backlog created by new informal settlements, for example, and the like requiring adequate sanitation services. The calculations also do not account for secondary backlog resulting from sanitation services that were previously provided but not maintained and that are therefore now unusable.

Considering current South African circumstances, it can be argued that the provision of sanitation services remains a moving target and achieving 100% access and eradication of this moving backlog target will remain a significant challenge for years to come. Therefore, although some WSAs have already achieved their targets and eradicated their primary backlog (indicated in blue), this additional or secondary backlog cannot be ignored.

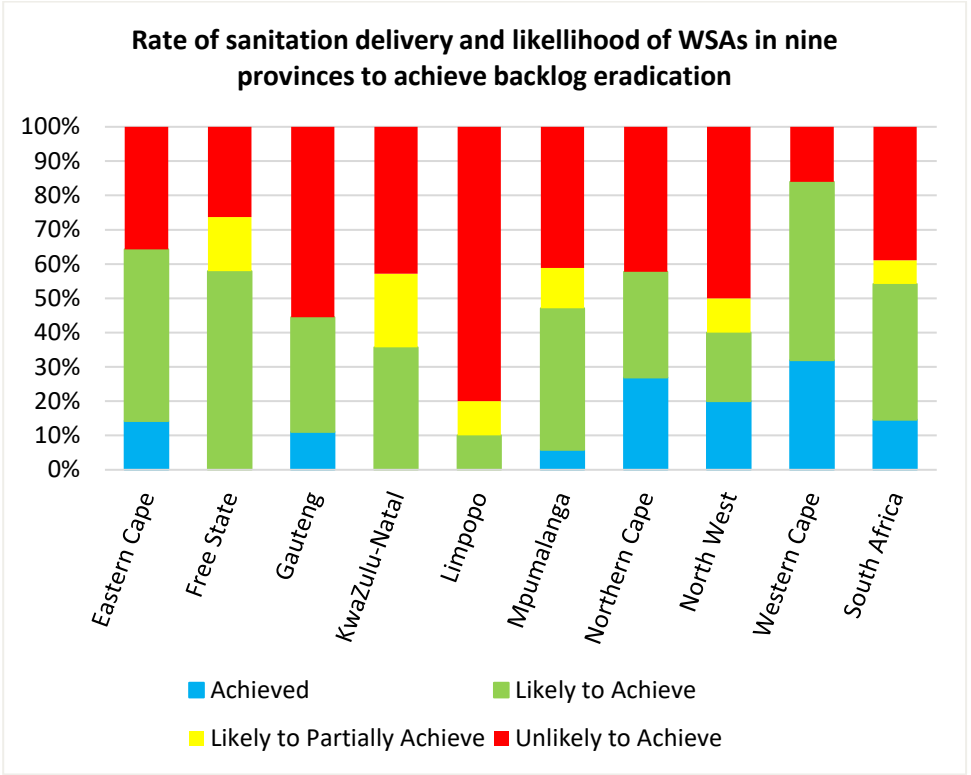


FIGURE 2-11: RATE OF SANITATION DELIVERY AND LIKELIHOOD OF WSAS IN NINE PROVINCES TO ACHIEVE BACKLOG ERADICATION

- 21 WSAs have already eradicated their backlog (blue).
- 57 WSAs have a good chance of eradicating their backlog by 2030 (green).
- 10 WSAs are likely to make progress but are likely to only eradicate backlogs partially (yellow).
- 56 WSAs are not addressing their backlogs quickly enough and are unlikely to achieve backlog eradication by 2030 (red).

NOTE: For municipal level data, refer to the specific provincial data in chapters 3 to 11.

2.7 Typical sanitation systems in South Africa

What sanitation technologies are typically used?

WSAs are responsible for ensuring that appropriate sanitation systems are implemented, operated and maintained. Although much effort has been put into providing access to sanitation, it is important that equal attention be given to all components of the sanitation service chain. In South Africa, there is a combination of sewered and non-sewered sanitation systems (NSSSs), as indicated in Table 2-6.

TABLE 2-6: TYPICAL SANITATION SYSTEMS IN SOUTH AFRICA

<table>
<tr><th colspan="2">Containment</th><th colspan="2">Emptying/transport</th><th colspan="2">Treatment</th><th colspan="2">Disposal/reuse</th></tr>
<tr><th>Sewered</th><th>Non-sewered (NS)</th><th>Sewered</th><th>Non-sewered (NS)</th><th>Sewered</th><th>Non-sewered (NS)</th><th>Sewered</th><th>Non-sewered (NS)</th></tr>
<tr><td>Flush toilet (connected to sewage system)</td><td>Flush toilet (with septic tank); ventilated pit latrine; chemical toilet; pit latrine (without ventilation); bucket toilet</td><td rowspan="2">Sewer pipes; pump stations</td><td rowspan="2">Mechanically assisted - e.g. vacuum trucks or honeysuckers; not aware of manual emptying - e.g. human digging; some FS stays in pit latrines (must ensure adequately covered)</td><td rowspan="2">Wastewater treatment works (WWTWs), including activated sludge based, biological nutrient removal based, trickling filter (biofilter) based, pond and lagoon based and combinations thereof</td><td rowspan="2">Not aware of any FS treatment plants (only FS treatment demonstration plants in Johannesburg through Water Research Commission (WRC)); FS mostly transported to WWTW for co-treatment</td><td rowspan="2">Effluent: mostly discharged to environment or evaporated; some effluent used for irrigation and mining
Sludge: mostly stockpiled on site at WWTWs; some solar drying beds, some landfilled, limited belt press dewatering, very little to no beneficial use</td><td rowspan="2">FS mostly co-treated at WWTWs; some FS landfilled, else stockpiled; very little to no beneficial use of FS</td></tr>
<tr><td colspan="2">There are also communities with no facilities – this implies that open defecation might be taking place</td></tr>
<tr><td colspan="2">Limited use of innovative or alternative toilet technologies (e.g. low flush)</td><td colspan="2">Limited use of innovative or alternative emptying technologies</td><td colspan="2">Limited use of innovative or alternative treatment technologies</td><td colspan="2">Limited use of innovative or alternative technologies for beneficiation or reuse</td></tr>
</table>

2.8 1st order excreta flow diagram (SFD)

What is an SFD? What is a 1st order SFD?

An SFD is a tool that summarises service outcomes in terms of the flow and fate of human waste (excreta) in a municipal or city area. It's an easy-to-understand visual representation of the flow of excreta and serves as an advocacy tool to ensure that excreta are managed safely throughout the sanitation service chain. An SFD is beneficial in that it offers an innovative way to engage stakeholders, including political leaders, sanitation experts, and civil society organisations, in co-ordinated dialogues about excreta management. In other words, an SFD can help improve understanding and communication of technical issues to non-technical persons and can subsequently be used to support decision-making regarding sanitation planning and programming.

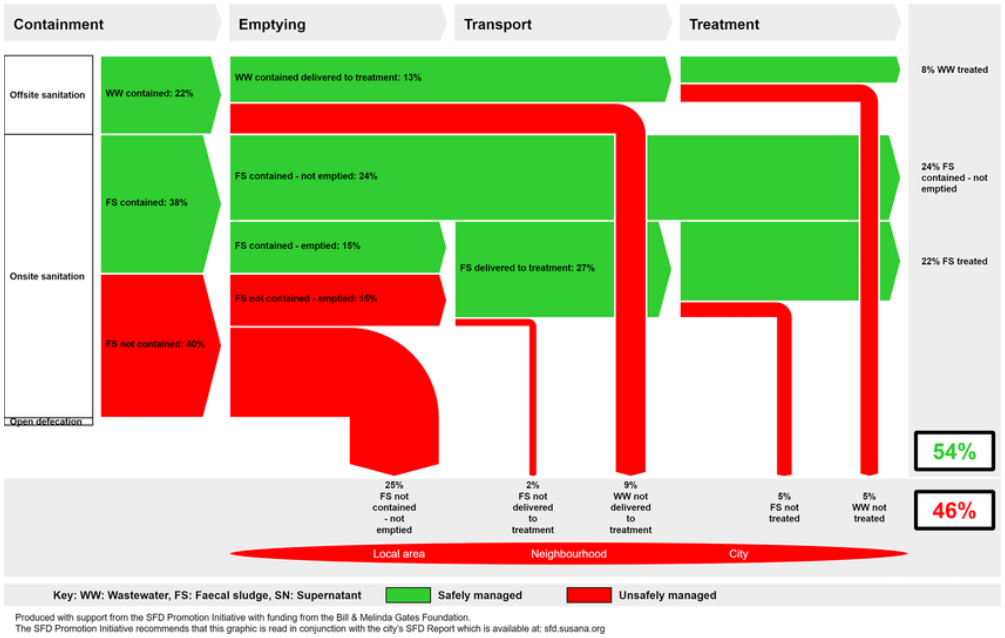


FIGURE 2-12: EXAMPLE OF A TYPICAL SFD DIAGRAM (JOHNSON ET AL., 2022)

A complete SFD includes an SFD graphic (as depicted in Figure 2-12) and an associated report in which the data used, and assumptions made, are defined. DWS has identified the SFD as a useful tool to better understand sanitation needs and requirements in South Africa. DWS aims to roll out SFDs in a phased approach, starting with 36 WSAs across the country. It is anticipated that selected WSAs will start developing SFDs in early 2024.

At present, only a few WSAs in South Africa have developed SDFs. It is therefore not yet feasible to develop a comprehensive provincial or national perspective on the status of sanitation based on the outputs from the SFD.

Considering that it will take time to develop SFDs for all 144 WSAs in South Africa, an SFD approximation is developed using available sanitation data. The output from this exercise has been called the '1st order SFD', developed for South Africa and for all nine provinces.

The 1st order SFD is a useful tool to guide and influence appropriate strategy and planning. Its benefits include:

- Lower cost and/or shorter time to obtain a strategic overview of key challenges along the sanitation service chain – e.g. poor performance or lack of data
- Common language for the sector – e.g. what Green Drop certification has done
- Useful to national planning and reporting obligations – e.g. can support tracking of Water and Sanitation Master Plan, Medium Term Strategic Framework (MTSF), NT Circular 88 and other reporting processes
- Aligned to international reporting obligations – e.g. can support the tracking of SDGs, JMP, WHO GLAAS, AMCOW and other reporting processes

As improved data becomes available (e.g. through SFD development or other related sanitation initiatives), the 1st order SFD can continue to be reviewed and refined.

The 1st order SFD differs from a traditional SFD in the following ways:

- Is based on readily available datasets at national or provincial level (secondary data)
- Does not include primary data collection or analysis (e.g. no interviews with officials)
- Does not include any data verification (e.g. no site assessments)
- Does not generate a typical SFD graphic; highlights key weaknesses in the service chain
- Is based on the aggregation of data from all WSAs in the province or country (while a traditional SFD is generated at town or city or municipal level)

1st Order SFD: South Africa

What are some of the contributors to poor sanitation performance?

The 1st order SFD for South Africa (Figure 2-13) highlights significant gaps in the sanitation service chain. These deficiencies all potentially have a negative impact on communities (e.g. water supply) and the environment (e.g. water sources).

Containment:

- Inappropriately constructed on-site sanitation systems

Emptying and transport:

- Lost sewage due to old and leaking pipes
- Inadequate maintenance and servicing of basic sanitation systems (e.g. not emptied)
- Lack of control of transportation of FS (no monitoring or management)

Treatment

- Poorly operated, maintained and managed WWTWs resulting in poor performance or non-compliance

End-use or disposal

- Inadequate sludge analysis and classification, and resultant inappropriate sludge disposal and/or non-beneficial use

Institutional

- Inadequate sanitation systems or programme funding

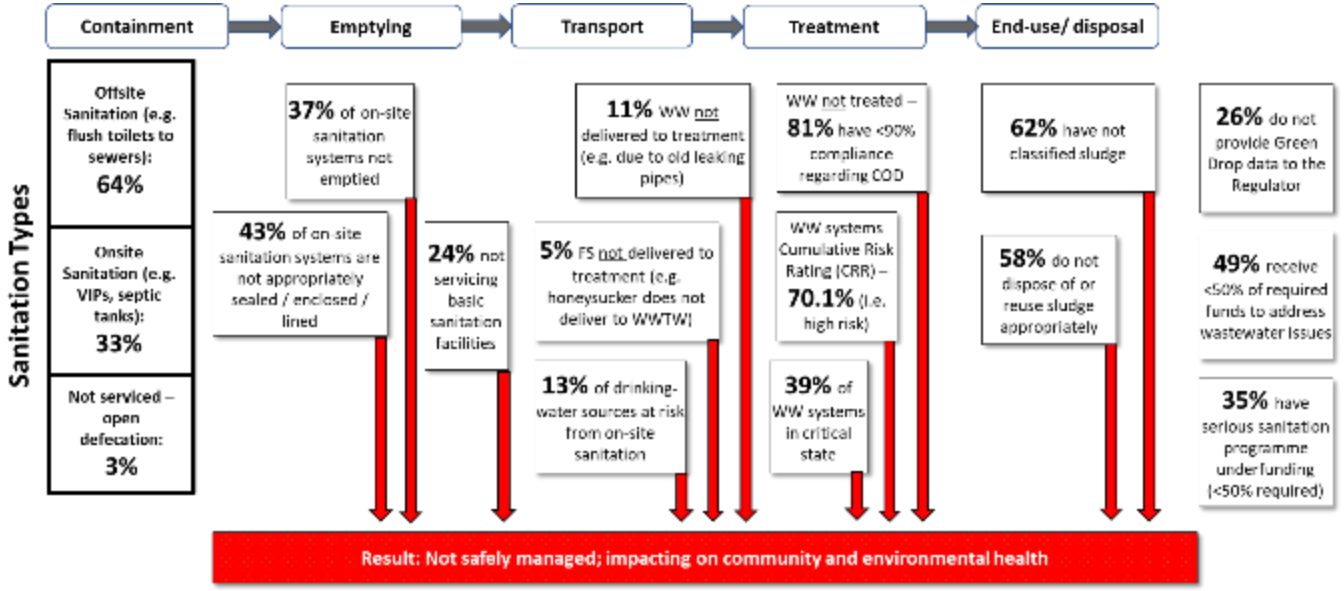


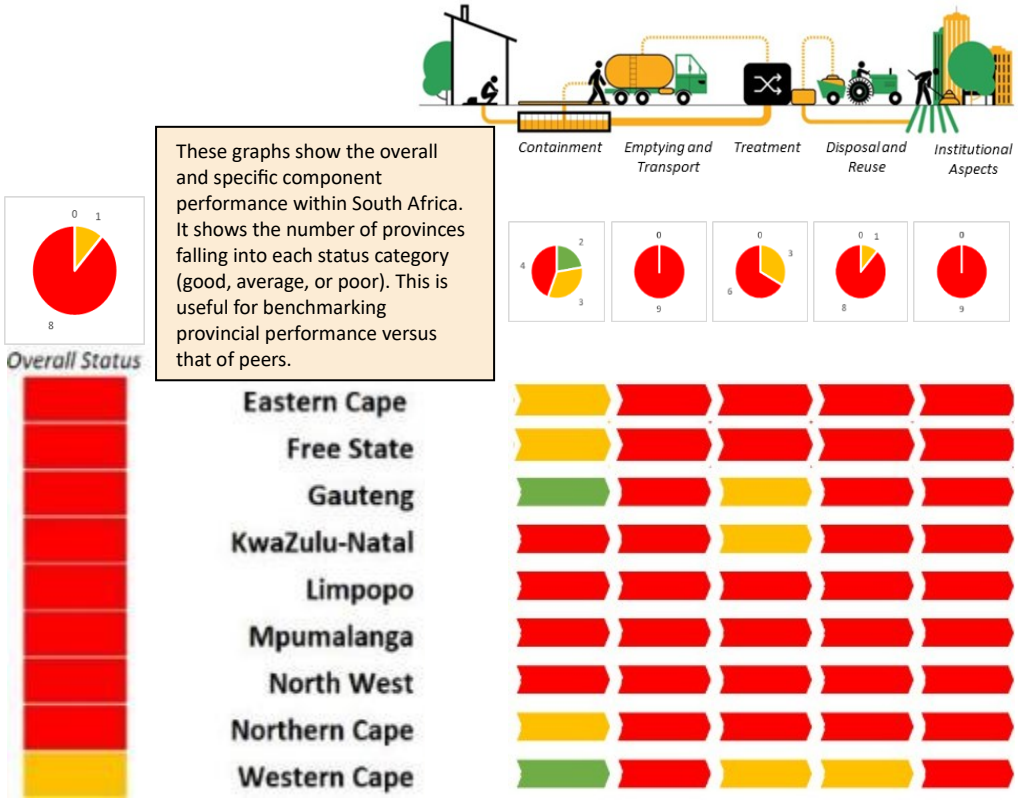
FIGURE 2-13: 1ST ORDER SFD: SOUTH AFRICA

2.9 Sanitation status along the service chain: South Africa

An analysis of the sanitation service chain shows there is much work to do

From available data, and considering the quality of data received, 15 indicators were selected and analysed to inform the status along the sanitation service chain. In addition to three indicators per the four service chain components, a further three indicators were analysed considering institutional aspects. The indicator analysis results, extracted from the situational analysis tool developed for the NSIP Project, are shown in Figure 2-16 to Figure 2-19. The colour coding indicates different levels of effectiveness based on the scoring criteria defined in the situational analysis tool (refer to Section 16.2). In general, green signifies that systems are functioning well and meeting expectations (as defined per scoring criteria); amber suggests average performance, indicating areas for improvement; and red highlights poor performance or significant issues that require immediate attention.

The visual representation in Figure 2-16 provides a comprehensive overview of the sanitation status along the service chain for all provinces in the country, allowing for quick and easy assessment at a glance. Overall, the performance of sanitation services across all provinces is below ideal standards, with most requiring immediate attention throughout the entire service chain. While some provinces demonstrate average performance in certain aspects, indicating potential areas for improvement, a few provinces have well-functioning containment systems that meet the targeted expectations outlined in the scoring criteria.



Overall score	
>75%	Good
50%-75%	Average
<50%	Poor

- Overall, the status of (i) emptying and transport, and (ii) institutional aspects are categorised as 'poor' for all the provinces.
- Containment, although not ideal, appears to be effectively managed in most provinces. However, KwaZulu-Natal, Limpopo, Mpumalanga and North West are lagging behind in this regard.
- Some pockets of good performance are noted for treatment, while only one province is making inroads with disposal and reuse.
- There is still much work to do to improve sanitation in South Africa. The health of the sanitation service chain is far from ideal, and institutional aspects are also categorised as 'poor'. There is currently little innovation or value add related to the sanitation sector.
- Challenges are compounded by growing informal settlements and increasing vandalism/theft.

FIGURE 2-15: OVERVIEW OF SANITATION STATUS ALONG THE SERVICE CHAIN FOR NINE PROVINCES

2.9.1 Heat map: South Africa

The results of the analysis of the 15 indicators are represented for the nine provinces in the heat map in Figure 2-16. Green signifies that systems are functioning well and meeting the expectations defined by the scoring criteria. Amber indicates average performance, suggesting areas that require improvement, while red highlights poor performance or significant issues that require immediate attention. Although there are pockets of good performance, overall, the performance is far from ideal.

Indicator #	South Africa	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	North West	Nothern Cape	Western Cape
	Overall sanitation status									
	Containment									
1	No sanitation (backlog) (DWS WSKS) (April 2023)									
2	Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)									
3	Rate of sanitation delivery (backlog eradication)									
	Emptying and Transport									
4	Pit toilet emptying									
5	Vacuum truck / honeysucker needs									
6	Vacuum truck / honeysucker condition									
	Treatment									
7	WWTW design capacity utilised									
8	WWTW effluent quality									
9	WWTW staffing shortfall									
	Disposal and Reuse									
10	Analysis and classification of wastewater sludge									
	Wastewater sludge management									
11	Analysis and classification of faecal sludge									
	Faecal sludge management									
12	Treated wastewater effluent reuse									
	Institutional Aspects									
13	Green Drop performance									
14	Sanitation staff vacancies									
15	Sanitation business financial status									

Green – Good	Amber – Average	Red – Poor

FIGURE 2-16: HEAT MAP SHOWING THE STATUS OF THE 15 INDICATORS FOR THE NINE PROVINCES

2.9.2 Rating WSAs: Sanitation service chain elements

The performance of each of the 15 indicators of the sanitation service chain highlights key deficiencies at WSAs

Using the heat map and total scores of the 15 indicators, each WSA in South Africa is ranked from poorest-performing on the left to best-performing on the right, as shown in Figure 2-18 and Figure 2-19. WSAs facing significant challenges across the sanitation service chain, including related institutional factors, are marked mostly in red, starting on the far left, while those that are performing well are indicated mostly in green, moving towards the far right.

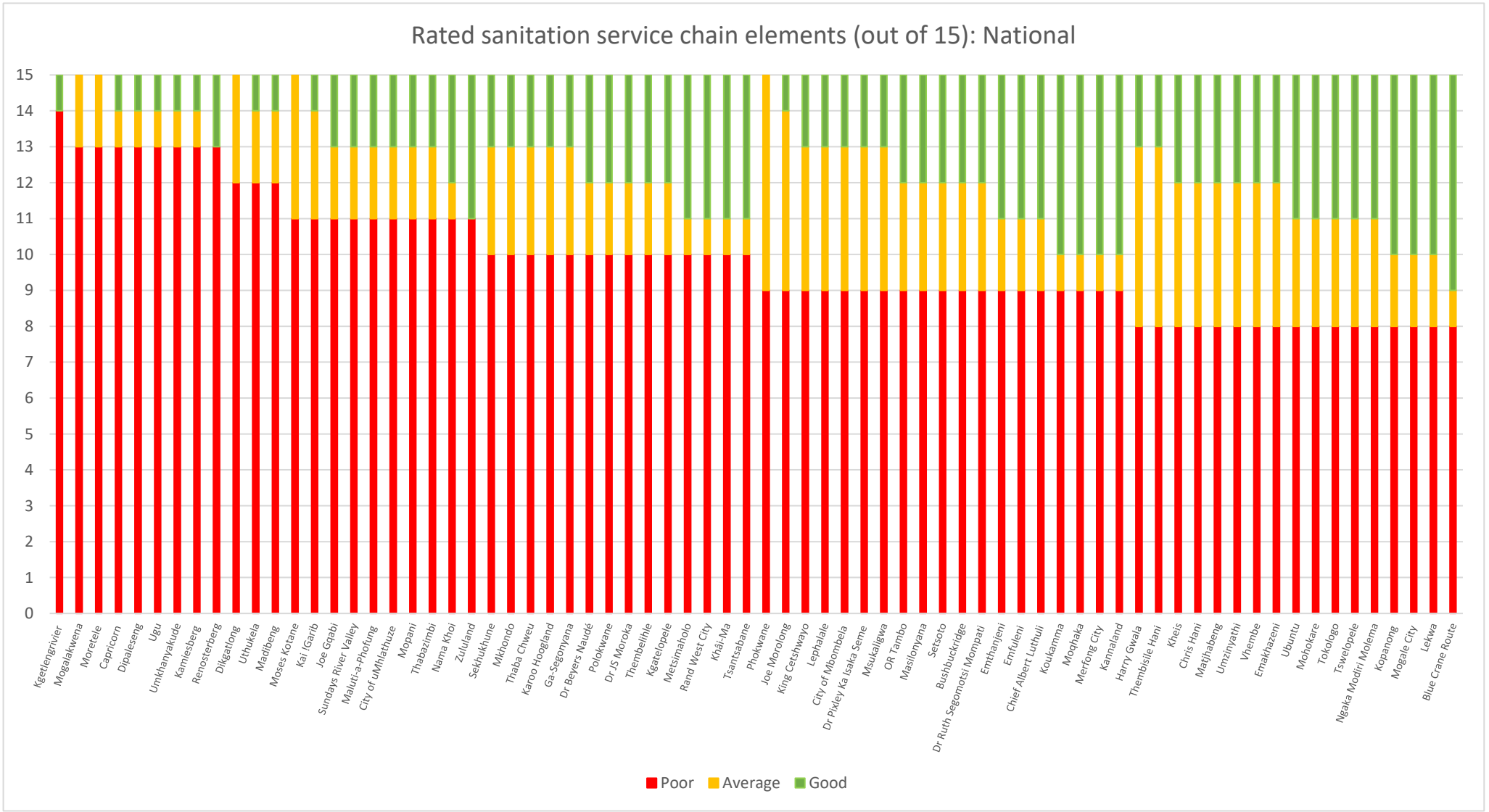


FIGURE 2-17: RATED WSAS IN SOUTH AFRICA BASED ON THE PERFORMANCE OF THE 15 INDICATORS (LEFTMOST COLUMN = POOREST PERFORMER; RIGHTMOST COLUMN = BEST PERFORMER) (1)

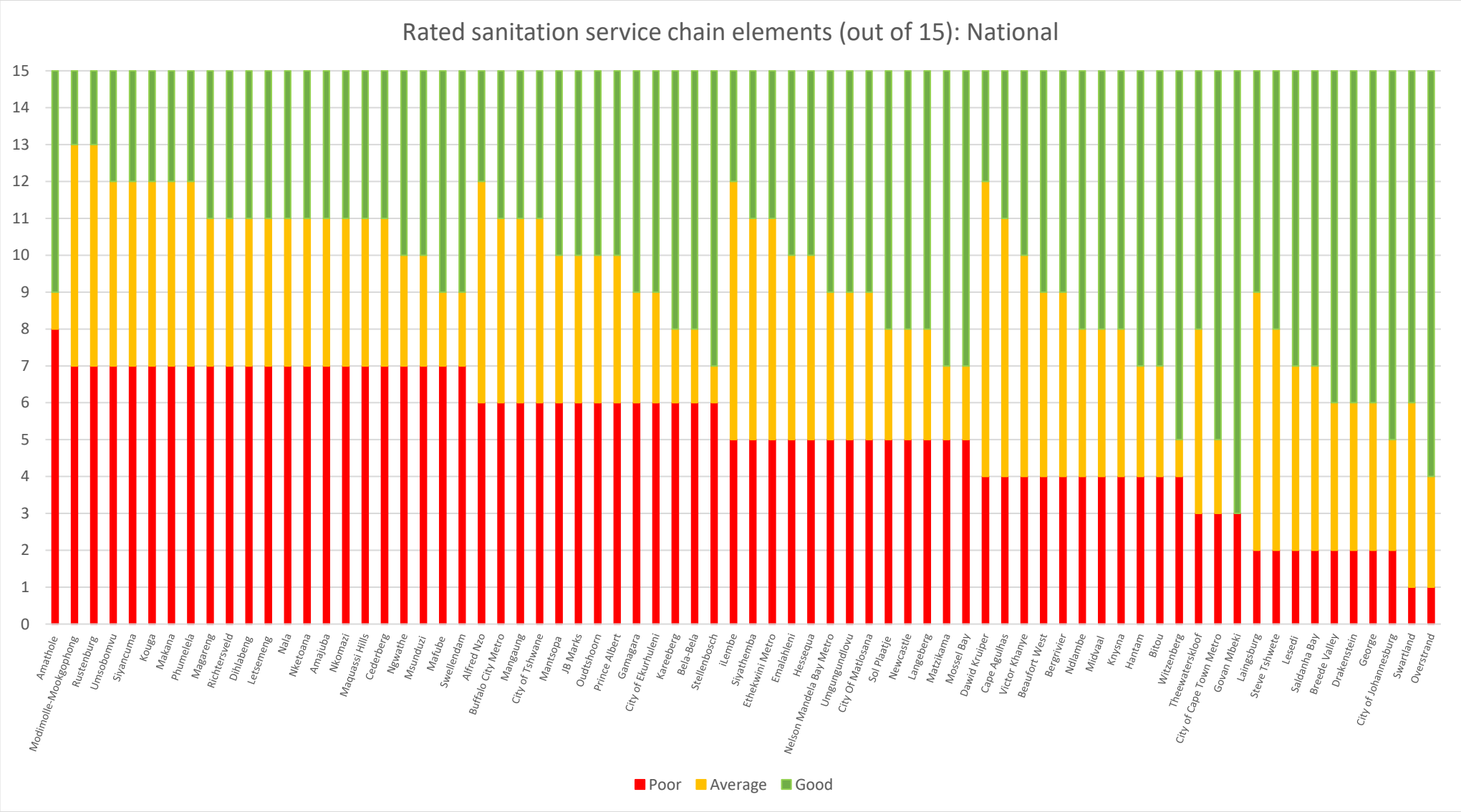


FIGURE 2-18: RATED WSAS BASED ON THE PERFORMANCE OF THE 15 INDICATORS (LEFTMOST COLUMN = POOREST PERFORMER; RIGHTMOST COLUMN = BEST PERFORMER) (2)

2.10 Key insights: South Africa

Is the country's sanitation in good health?

The analysis below provides a snapshot of South Africa's status per province as of 2022/23. More detailed insights can be gathered from the provincial reports and the associated individual WSA reports.

Overall

The sanitation status of South Africa can be categorised as 'poor'.

Access to sanitation/Containment

The data on sanitation provision across South Africa reveals regional disparities between access to sewer systems, on-site sanitation, and the proportion of households without sanitation, with these differences often correlating to the urban– rural split within each province.

The rural–urban distribution varies considerably across provinces. The Free State, Gauteng, and the Western Cape have a very high proportion of urban settlements, with the Free State (91%), Gauteng (90%), and the Western Cape (92%) being predominantly urban. The Northern Cape, while slightly less urbanised, also has a relatively high urban population (77%). In contrast, Limpopo has a very large proportion of rural settlements (80%), where access to sanitation infrastructure is limited. The Eastern Cape, KwaZulu-Natal, Mpumalanga, and North West show a near-even split between rural and urban areas.

As a general trend, urban areas across South Africa tend to be serviced by sewer systems, while rural areas are more dependent on on-site sanitation solutions. The Western Cape and Gauteng stand out for their high levels of access to sewer systems, with the Western Cape at 96% and Gauteng at 90% of households connected to the sewer network. Similarly, the Free State and Northern Cape is dominated with sewer systems, with 74% and 69% of households, respectively, connected to the sewer network. Conversely, Limpopo is highly reliant on on-site sanitation, with 74% of households using on-site sanitation systems.

The Western Cape, Gauteng, and the Free State report very low percentages of households with no access to sanitation, with almost 0%, 1% and 2%, respectively. In contrast, the Eastern Cape, KwaZulu-Natal, Limpopo, Mpumalanga, the Northern Cape, and North West still face significant challenges in sanitation coverage, with 4% to 6% of households with no access to sanitation.

Bucket and chemical toilets

Although the use of bucket toilets declined between 2017 and 2021, as of 2023, over 208 000 households in the country continue to use bucket toilets. Gauteng has the highest number of households using bucket toilets (72 024), followed by KwaZulu-Natal with 42 683 and the Free State with 30 245 households. The other provinces report lower figures, with North West having the fewest at 5 274 households using bucket toilets. This highlights the ongoing sanitation challenges faced by many regions in the country.

In contrast, the number of households using chemical toilets in South Africa has doubled since 2017, with 1 300 000 households served by chemical toilets as of 2023. KwaZulu-Natal has the highest number of households served by chemical toilets (532 341), followed by Gauteng with 276 462 and the Eastern Cape with 137 215 households. The other provinces report lower figures, with the Western Cape having the fewest at 5 259 households with chemical toilets (DWS, 2023b). This highlights the reliance on chemical toilets in many areas.

The continued use of bucket toilets and the increasing reliance on chemical toilets contribute to the ongoing backlog across provinces in the country. These types of sanitation solutions, while providing a temporary alternative, do not meet the standards of more permanent and hygienic sanitation infrastructure.

Sanitation backlog

At the current trajectory, South Africa is not on track to meet the objective of improving sanitation by 2030 and specifically achieving the SDG 6.2 target.

Three provinces (Eastern Cape, KwaZulu-Natal, Mpumalanga) indicated significant 'no service' backlogs, while four provinces (KwaZulu-Natal, Limpopo, Mpumalanga, North West) have significant backlog.

While one province (Western Cape) is on track to eradicate their sanitation backlogs, it is highly unlikely that three provinces (Gauteng, Limpopo, North West) will eradicate their backlogs by 2030, given the current rate of sanitation delivery.

Emptying and transport

Five provinces (Gauteng, KwaZulu-Natal, Limpopo, North West, Western Cape) indicated that pit emptying is not a regular occurrence. This means that users will need to empty their own pits, dig their own new pits, or resort to

other means. WSAs need to ensure that users are aware of appropriate safety and hygiene measures to follow.

All nine provinces indicated a significant shortage of vacuum trucks and honeysuckers, with many WSAs indicating that their need exceeds 100% of their current fleet (i.e. they need to at least double their fleet). This circumstance could also be limiting current pit-emptying activities.

Furthermore, the condition most of the existing vacuum trucks and honeysuckers is far from ideal, with seven provinces (Eastern Cape, Free State, Gauteng, Limpopo, North West, Northern Cape, Western Cape) indicating that they are generally in poor condition. This implies that breakdowns are inevitable and indicates a further vulnerability in emptying and transport.

Treatment

Although only one province (Northern Cape) seems to have significant stress related to the availability of spare capacity at WWTWs throughout the province, it is noted that there are significant challenges at individual WSAs and associated WWTWs throughout South Africa (see the provincial and WSA reports for further details).

The effluent compliance performance of eight provinces (Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, North West, Northern Cape) is not ideal, with many WSAs having a treated effluent quality with an overall compliance of less than 50%.

All nine provinces indicated a significant challenge with regard to staffing at WWTWs, with many WSAs indicating an overall staffing shortfall greater than 35%. This could contribute to the noted performance challenges.

Disposal and reuse

Eight provinces (Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, North West, Northern Cape) scored poorly for wastewater sludge management, as WSAs in these provinces do not analyse and classify their wastewater sludge and/or do not proactively manage their sludge end-use and disposal.

Likewise, eight provinces (Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Mpumalanga, North West, Northern Cape, Western Cape) scored poorly for FSM, as WSAs in these provinces do not analyse and classify their FS and/or do not proactively manage their FS end-use and disposal. It is common practice at many WSAs to co-treat FS at their WWTWs. This could also be contributing to the poor performance noted.

The reuse of treated wastewater effluent appears to be limited in eight provinces (Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, North West, Northern Cape). This lack of reuse could be due to the poor quality of treated effluent.

Institutional aspects

Most provinces did not perform well in the most recent Green Drop assessment, with eight provinces (Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, North West, Northern Cape) having many WSAs with a very poor Green Drop performance score of less than 50%.

All nine provinces have a significant sanitation staff challenge, with many WSAs having sanitation staff vacancies of more than 35%.

All nine provinces have a sanitation business that is financially stressed, with many WSAs operating their sanitation business at a deficit. Improving revenue collection/payment by users and tapping into circular economy (CE) opportunities (e.g. waste as a resource) could help alleviate the current circumstances.

Photo: Filiz Elaerts on Unsplash

3 Situational analysis: Eastern Cape

Section 3 provides a summary of data and findings from the **Eastern Cape Situational Analysis** report.

For access to the full report, scan the QR code above.

What is the current reality in the province?

3.1 Eastern Cape overview

Water services authorities

WSAs are responsible for supplying both water and sanitation services to households in their area of jurisdiction. In the Eastern Cape, there are:

- 2 metropolitan municipalities
- 6 district municipalities
- 31 local municipalities
- 14 WSAs

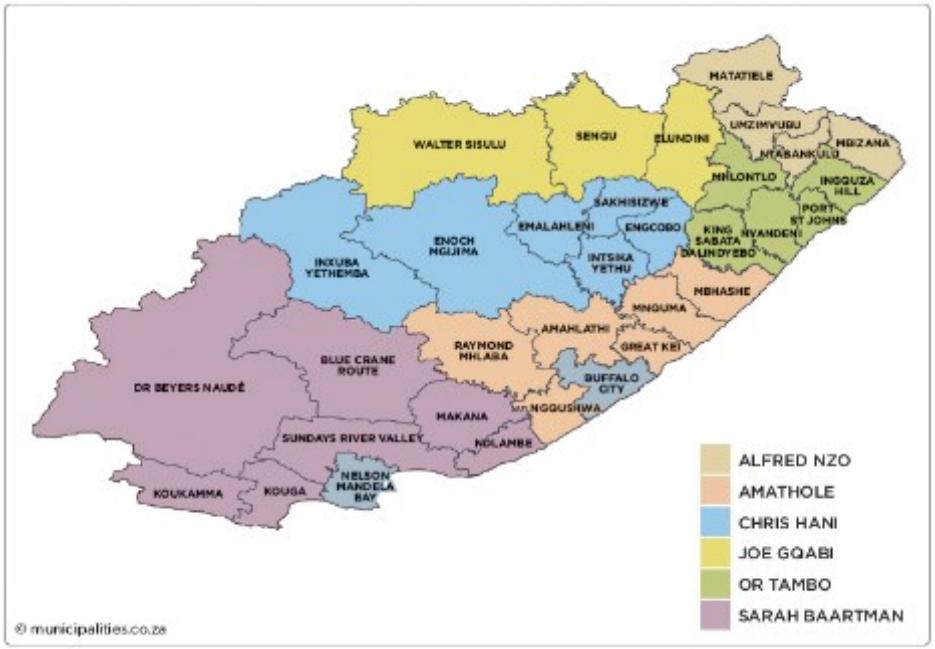


FIGURE 3-1: MUNICIPALITIES AND WSAS IN THE EASTERN CAPE

Metropolitan municipalities
Buffalo City Town*
Nelson Mandela Bay*

District municipalities	
Alfred Nzo*	Chris Hani*
Amathole*	Joe Gqabi*
Sarah Baartman	OR Tambo*

Local municipalities		
Matatiele	Dr Beyers Naudé*	Sakhisizwe
Ntabankulu	Kouga*	Elundini
Umzimvubu	Koukamma*	Senqu
Winnie Madikizela-Mandela	Makana*	Walter Sisulu
Amahlathi	Ndlambe*	Ingquza Hill
Great Kei	Sundays River Valley*	King Sabata Dalindyebo
Mbhashe	Emalahleni	Mhlontlo
Mnquma	Engcobo	Nyandeni
Ngqushwa	Enoch Mgijima	Port St Johns
Raymond Mhlaba	Intsika Yethu	
Blue Crane Route*	Inxuba Yethemba	

(* indicates WSA)

3.2 Access to sanitation: Households

Sanitation service levels per household: A provincial view

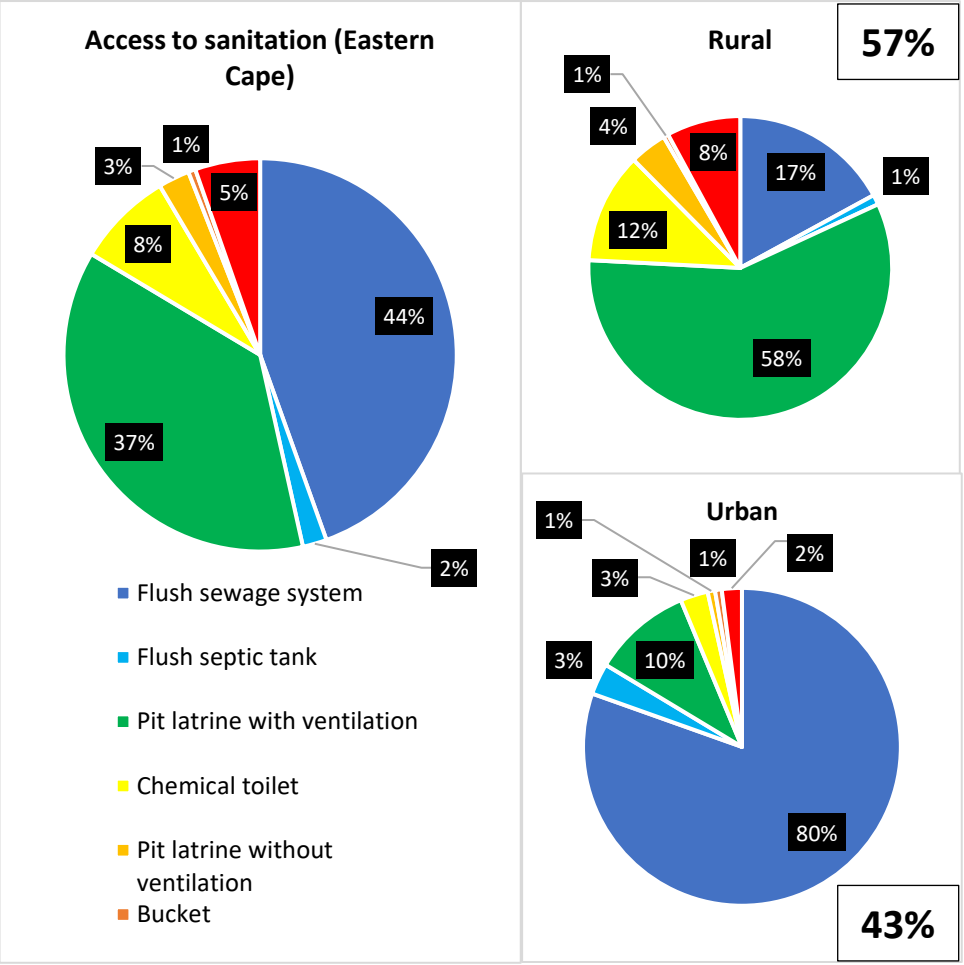


FIGURE 3-2: SANITATION SERVICE LEVELS PER HOUSEHOLD IN THE EASTERN CAPE

An analysis of sanitation provision by settlement type (see Figure 3-2 and Table 3-2) depicts a total number of 1 739 977 households in the Eastern Cape, of which 987 113 (57%) are rural settlements and 752 864 (43%) urban settlements (DWS, 2022b).

The data shows that provincially:

- **44%** of households have access to a flush toilet connected to the sewage system.
- **5%** of households do not have access to sanitation (implying open defecation).
- The remaining **51%** of households utilise some form of on-site sanitation system, including septic tanks (2%), pit latrines with ventilation (i.e. VIPs) (37%), chemical toilets (8%), pit latrines without ventilation (3%) and bucket latrines (1%).

In rural settlements:

- **17%** of households have access to a flush toilet connected to the sewage system.
- **8%** of households do not have access to sanitation (implying open defecation).
- The remaining **75%** of households utilise some form of on-site sanitation system, including septic tanks (1%), pit latrines with ventilation (i.e. VIPs) (58%), chemical toilets (12%), pit latrines without ventilation (4%) and bucket latrines (1%).

In urban settlements:

- **80%** of households have access to a flush toilet connected to the sewage system.
- **2%** of households do not have access to sanitation (implying open defecation).
- The remaining **18%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (10%), chemical toilets (3%), pit latrines without ventilation (1%) and bucket latrines (1%).

The analysis of sanitation provision by settlement type at the WSA level in the Eastern Cape is depicted in Figure 3-3 and detailed in Table 3-1 and Table 3-2.

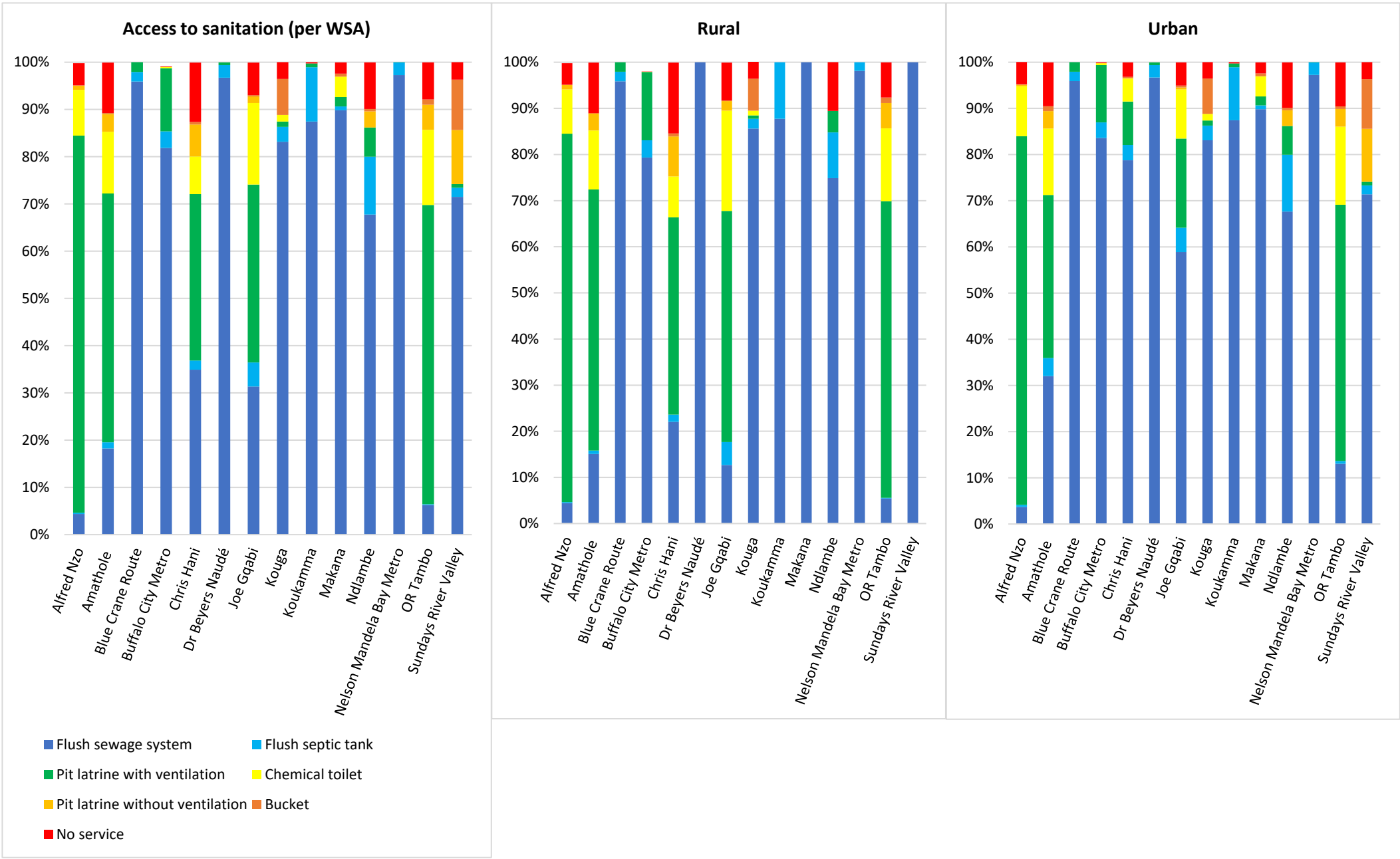


FIGURE 3-3: SANITATION SERVICE LEVELS PER HOUSEHOLD IN 14 WSAS IN THE EASTERN CAPE

TABLE 3-1: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN THE EASTERN CAPE (1)

(DWS WSKS) (April 2023)

Region	Total households (HH)	%	Flush sewage HH	%	Flush septic tank HH	%	Pit latrine with ventilation HH	%	Chemical toilet HH	%	Pit latrine without ventilation HH	%	Bucket HH	%	No service HH	%
Alfred Nzo	220 754		9 666	4	563	0	176 293	80	21 332	10	2 010	1	129	0	10 292	5
Rural	207 404	94	9 171	4	503	0	165 634	80	19 892	10	1 963	1	115	0	9 651	5
Urban	13 350	6	495	4	60	0	10 659	80	1 440	11	47	0	14	0	641	5
Amathole	195 919		35 706	18	2 628	1	103 183	53	25 546	13	7 350	4	406	0	20 941	11
Rural	159 565	81	24 056	15	1 200	1	90 348	57	20 334	13	5 967	4	15	0	17 504	11
Urban	36 354	19	11 650	32	1 428	4	12 835	35	5 212	14	1 383	4	391	1	3 437	9
Blue Crane Route	8 926		8 561	96	181	2	184	2	0	0	0	0	0	0	0	0
Rural	1 986	22	1 904	96	41	2	41	2	0	0	0	0	0	0	0	0
Urban	6 940	78	6 657	96	140	2	143	2	0	0	0	0	0	0	0	0
Buffalo City Metro	228 846		187 299	82	8 027	4	30 662	13	638	0	0	0	0	0	301	0
Rural	94 786	41	75 214	79	3 545	4	14 019	15	73	0	0	0	0	0	28	0
Urban	134 060	59	112 085	84	4 482	3	16 643	12	565	0	0	0	0	0	273	0
Chris Hani	176 677		61 716	35	3 423	2	62 221	35	14 060	8	11 931	7	953	1	22 250	13
Rural	136 585	77	30 140	22	2 094	2	58 440	43	12 091	9	11 857	9	865	1	20 981	15
Urban	40 092	23	31 576	79	1 329	3	3 781	9	1 969	5	74	0	88	0	1 269	3
Dr Beyers Naudé	18 751		18 137	97	501	3	109	1	0	0	0	0	0	0	0	0
Rural	235	1	235	100	0	0	0	0	0	0	0	0	0	0	0	0
Urban	18 516	99	17 902	97	501	3	109	1	0	0	0	0	0	0	0	0
Joe Gqabi	86 273		27 057	31	4 397	5	32 481	38	14 899	17	1 194	1	219	0	5 979	7
Rural	51 385	60	6 508	13	2 561	5	25 752	50	11 170	22	1 063	2	74	0	4 224	8
Urban	34 888	40	20 549	59	1 836	5	6 729	19	3 729	11	131	0	145	0	1 755	5

TABLE 3-2: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN NINE PROVINCES (2)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Kouga	31 858		26 492	83	1 007	3	355	1	444	1	0	0	2 434	8	1 125	4
Rural	896	3	767	86	19	2	7	1	9	1	0	0	62	7	33	4
Urban	30 962	97	25 725	83	988	3	348	1	435	1	0	0	2 372	8	1 092	4
Koukamma	10 485		9 170	87	1 202	11	84	1	0	0	0	0	0	0	29	0
Rural	188	2	165	88	23	12	0	0	0	0	0	0	0	0	0	0
Urban	10 297	98	9 005	87	1 179	11	84	1	0	0	0	0	0	0	29	0
Makana	20 518		18 433	90	169	1	403	2	881	4	14	0	123	1	493	2
Rural	46	0	46	100	0	0	0	0	0	0	0	0	0	0	0	0
Urban	20 472	100	18 387	90	169	1	403	2	881	4	14	0	123	1	493	2
Ndlambe	18 815		12 746	68	2 310	12	1 163	6	0	0	637	3	97	1	1 860	10
Rural	171	1	128	75	17	10	8	5	0	0	0	0	0	0	18	11
Urban	18 644	99	12 618	68	2 293	12	1 155	6	0	0	637	3	97	1	1 842	10
Nelson Mandela Bay Metro	333 000		323 828	97	9 113	3	61	0	0	0	0	0	0	0	0	0
Rural	1 403	0	1 377	98	26	2	0	0	0	0	0	0	0	0	0	0
Urban	331 597	100	322 451	97	9 087	3	61	0	0	0	0	0	0	0	0	0
OR Tambo	373 589		23 445	6	643	0	236 647	63	59 415	16	19 829	5	4 269	1	29 166	8
Rural	332 400	89	18 066	5	403	0	213 796	64	52 441	16	18 258	5	4 039	1	25 231	8
Urban	41 189	11	5 379	13	240	1	22 851	55	6 974	17	1 571	4	230	1	3 935	10
Sundays River Valley	15 566		11 132	72	298	2	122	1	0	0	1 781	11	1 663	11	571	4
Rural	63	0	63	100	0	0	0	0	0	0	0	0	0	0	0	0
Urban	15 503	100	11 069	71	298	2	122	1	0	0	1 781	11	1 663	11	571	4
Eastern Cape	**1 739 977**		**773 388**	**44**	**34 462**	**2**	**643 968**	**37**	**137 215**	**8**	**44 746**	**3**	**10 293**	**1**	**93 007**	**5**
Rural	**987 113**	**57**	**167 840**	**17**	**10 432**	**1**	**568 045**	**58**	**116 010**	**12**	**39 108**	**4**	**5 170**	**1**	**77 670**	**8**
Urban	**752 864**	**43**	**605 548**	**80**	**24 030**	**3**	**75 923**	**10**	**21 205**	**3**	**5 638**	**1**	**5 123**	**1**	**15 337**	**2**

3.3 Bucket and chemical toilets in the Eastern Cape

Are bucket toilets still in use?

Bucket toilets should have already been eradicated in South Africa. Yet, as of 2023, there are still more than 10 000 households in the Eastern Cape using bucket toilets (DWS, 2023b), as illustrated in Figure 3-4.

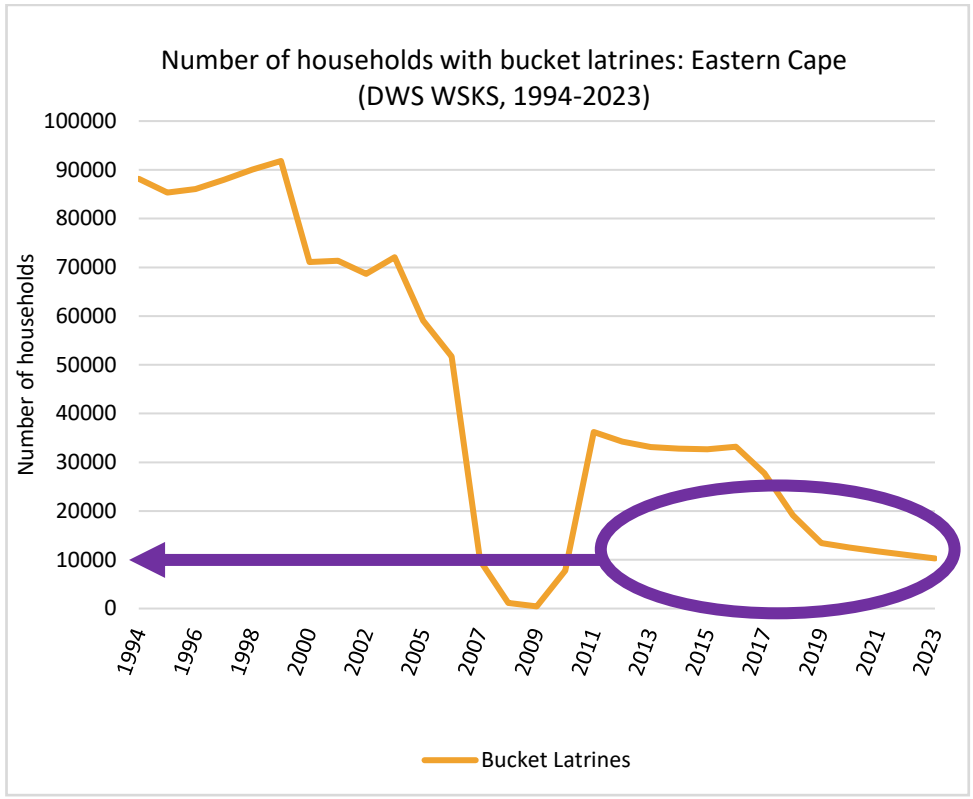


FIGURE 3-4: NUMBER OF HOUSEHOLDS WITH BUCKET LATRINES IN THE EASTERN CAPE FROM 1994 TO 2023

Are chemical toilets an issue?

Currently, more than 137 000 households in the Eastern Cape are served by chemical toilets (DWS, 2023b), as illustrated in Figure 3-5. Can the province afford this?

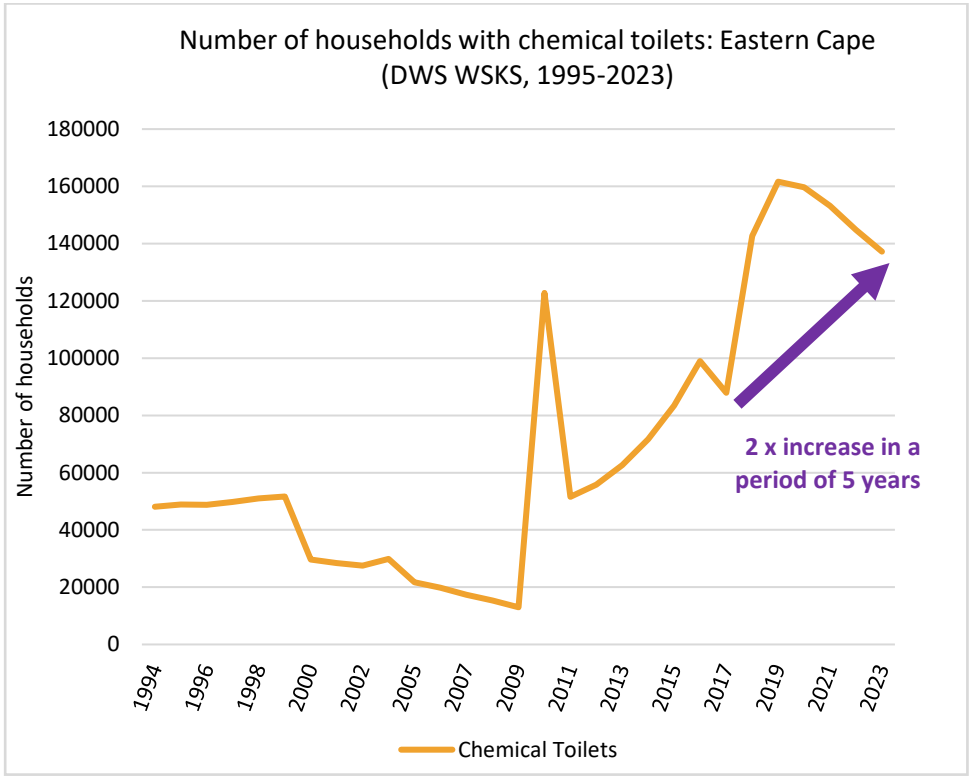


FIGURE 3-5: NUMBER OF HOUSEHOLDS WITH CHEMICAL TOILETS IN THE EASTERN CAPE FROM 1994 TO 2023

Assuming 2.5 households are served per chemical toilet (i.e. ~10 people per toilet, ~54 800 chemical toilets in operation), and chemical toilet rental costs of R750/month, this equates to a cost of **~R41 million/month** or **~R493 million/year**.

Could innovative sanitation alternatives meet the same needs (or perform even better) at a lower cost?

3.4 Progress on eradicating sanitation backlog

Is the Eastern Cape on target to eradicate sanitation backlogs?

WSAs with a significant overall backlog (i.e. inappropriate sanitation systems and no sanitation systems) include OR Tambo (30%), Amathole (28%), Chris Hani (28%), Joe Gqabi (26%) and Sundays River Valley (26%). Blue Crane Route, Dr Beyers Naude and Nelson Mandela Bay Metro have no sanitation backlogs. Figure 3-6 shows the percentage of appropriate, inappropriate and unacceptable sanitation for each WSA in the Eastern Cape, as well as the overall statistics for the province.

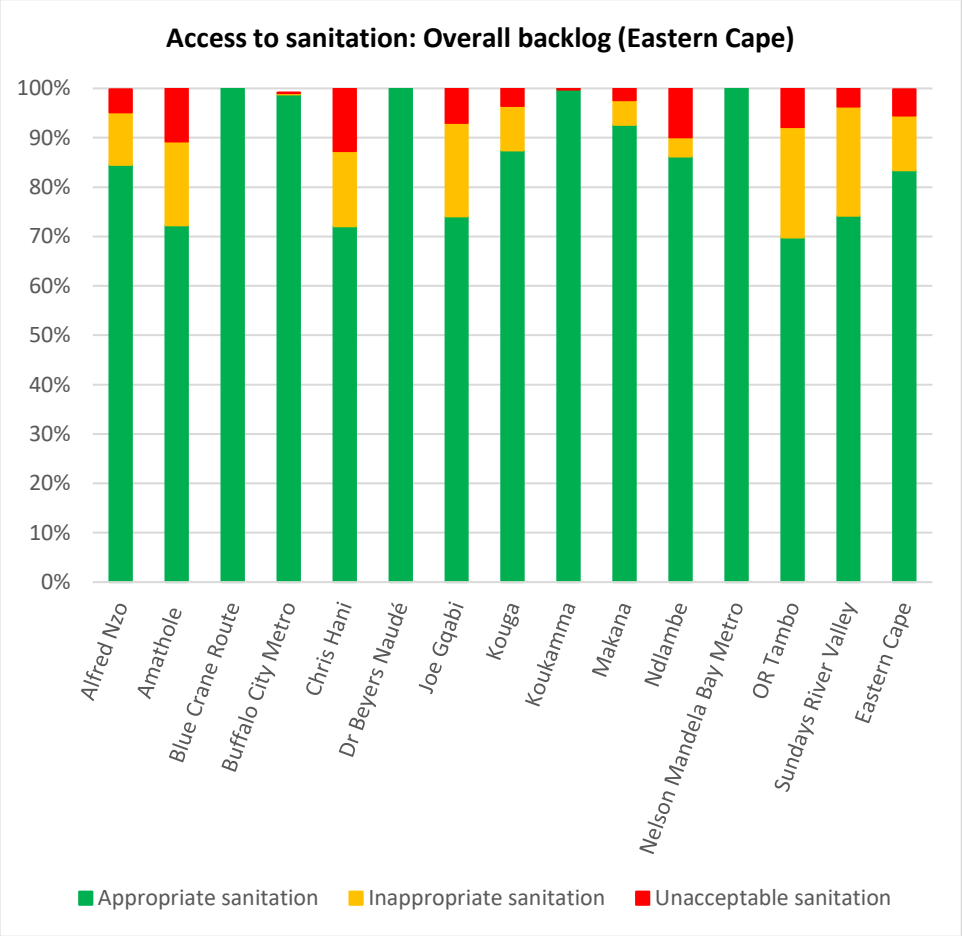


FIGURE 3-6: ACCESS TO SANITATION AND OVERALL BACKLOG IN THE EASTERN CAPE

TABLE 3-3: RATE OF SANITATION DELIVERY AND LIKELIHOOD OF WSAS IN THE EASTERN CAPE TO ACHIEVE BACKLOG ERADICATION

Rate of delivery (years to eradicate backlog)	End date	Years to achieve
Alfred Nzo	2026	4
Amathole	2025	3
Blue Crane Route	2021	0
Buffalo City Metro	2044	22
Chris Hani	2026	4
Dr Beyers Naudé	2090	169
Joe Gqabi	2025	3
Kouga	2077	55
Koukamma	2021	0
Makana	2036	15
Ndlambe	2026	5
Nelson Mandela Bay Metro	2029	7
OR Tambo	2028	6
Sundays River Valley	2041	20

NOTE: The figures were calculated in 2021. Has there been progress since then? Has the rate of sanitation service delivery (i) increased, (ii) stayed the same, or (iii) decreased? Understanding (a) sanitation backlog and (b) the rate of sanitation service delivery will help to determine if WSAs are on track to meet sanitation access-related SDGs.

From Table 3-3:

- 2 WSAs have already eradicated their backlog (blue).
- 7 WSAs have a good chance of eradicating their backlog by 2030 (green).
- 5 WSAs are not addressing their backlogs quickly enough and are unlikely to achieve backlog eradication.

3.5 Municipal sanitation status: Eastern Cape

Where is the Eastern Cape doing well?

Although access to sanitation has improved since 1994, the status of containment has been categorised as 'average', whilst emptying and transport, treatment, and disposal and reuse have been categorised as 'poor' for the Eastern Cape. It is not surprising that institutional aspects are also far from ideal. However, there appears to be some innovation or value add related to the sanitation sector in the province. Challenges are compounded by unfilled sanitation staff vacancies. Unfortunately, there is much more work to be done to improve sanitation in the province.

water & sanitation
Department: Water and Sanitation
REPUBLIC OF SOUTH AFRICA

National Sanitation Integrated Plan

Provincial Status Report
Eastern Cape

Provincial Status: Poor

National Status

Total Provinces
9

			Data Set (*indicates number of WSAs with data submitted*)
Context			
Population (DWS WSKS) (April 2023)	6676143		14 / 14
Number of households (DWS WSKS) (April 2023)	1739977	HH	14 / 14
Number of wastewater treatment works	123		14 / 14
Number of sewer pump stations	425		14 / 14
Length of sewer pipelines	7863	km	6 / 14
Containment		**Average**	
1.1 No sanitation (backlog) (DWS WSKS) (April 2023)	5	% HH	Poor 14 / 14
1.2 Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)	16	% HH	Average 14 / 14
1.3 Average rate of sanitation delivery (years to eradicate backlog)	22	years	Average 14 / 14
Emptying and Transport		**Poor**	
2.1 Sewer network condition	NI		0 / 14
2.2 Pit toilet emptying	64	% of WSAs	Average 14 / 14
2.3 Vacuum truck / honeysucker needs	61	trucks	Poor 14 / 14
2.4 Vacuum truck / honeysucker condition	50	% in fair condition	Poor 14 / 14
Treatment		**Poor**	
3.1 % of wastewater treatment works design capacity utilised	60	%	Average 13 / 14
3.1.1 Design capacity	540.7	Ml/d	14 / 14
3.1.2 Available capacity	531.0	Ml/d	14 / 14
3.1.3 Operational capacity	322.5	Ml/d	13 / 14
3.2 Wastewater treatment works effluent quality	18	% compliance	Poor 14 / 14
3.2.1 Microbiological compliance	14	%	14 / 14
3.2.2 Chemical compliance	20	%	14 / 14
3.2.3 Physical compliance	20	%	14 / 14
3.3 Wastewater treatment works staffing shortfall	49	%	Poor 14 / 14
3.3.1 Number of supervisor(s): Compliant	33		14 / 14
3.3.2 Number of supervisor(s): Shortfall	20		14 / 14
3.3.3 Number of PC(s): Compliant	131		14 / 14
3.3.4 Number of PC(s): Shortfall	138		14 / 14
Disposal and Reuse		**Poor**	
4.1 Analysis and classification of wastewater sludge	36	% of WSAs	Poor 14 / 14
4.2 Wastewater sludge management	0	% acceptable practices	13 / 14
4.3 Analysis and classification of faecal sludge	14	% of WSAs	Poor 13 / 14
4.4 Faecal sludge management	100	% acceptable practices	14 / 14
4.5 Treated wastewater effluent reuse	21	% of WSAs	Poor 14 / 14
Institutional Aspects		**Poor**	
5.1 Green Drop performance (2021)	51	%	Poor 14 / 14
5.2 Sanitation staff vacancies	38	%	Poor 11 / 14
5.3 Sanitation business financial status	79	% of WSAs operate a deficit	Poor 14 / 14
5.4 Growing informal settlements	57	% of WSAs	12 / 14
5.5 Shit-flow diagrams developed for sanitation systems	21	% of WSAs	14 / 14
5.6 Alternative/innovative sanitation processes or technologies implemented	57	% of WSAs have implement multiple	14 / 14
5.6.1 Toilets	*64*	% of WSAs	14 / 14
5.6.2 Emptying	*36*	% of WSAs	12 / 14
5.6.3 Transport	*36*	% of WSAs	13 / 14
5.6.4 Treatment	*71*	% of WSAs	14 / 14
5.6.5 Disposal benefication	*21*	% of WSAs	13 / 14
5.6.6 New business models	*14*	% of WSAs	13 / 14

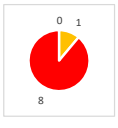


FIGURE 3-7: SANITATION STATUS IN THE EASTERN CAPE

3.6 1st order excreta flow diagram (SFD): Eastern Cape

What are some of the contributors to poor sanitation performance?

The 1st order SFD for the Eastern Cape (Figure 3-8) highlights significant gaps in the sanitation service chain. These deficiencies potentially have a negative impact on communities (e.g. water supply) and the environment (e.g. water sources).

Containment:

- Inappropriately constructed on-site sanitation systems (e.g. unsealed on-site sanitation systems)

Emptying and transport:

- Inadequate maintenance or servicing of basic sanitation systems (e.g. not emptied)
- Lost sewage due to old and leaking pipes

Treatment:

- Poorly operated, maintained and managed WWTWs resulting in poor performance or non-compliance
- More than 30% of WWTWs in critical state

End-use or disposal:

- Inadequate sludge analysis and classification, and resultant inappropriate sludge disposal and/or non-beneficial use

Institutional:

- Inadequate sanitation system or programme funding
- Lack of provision of Green Drop data to the regulator

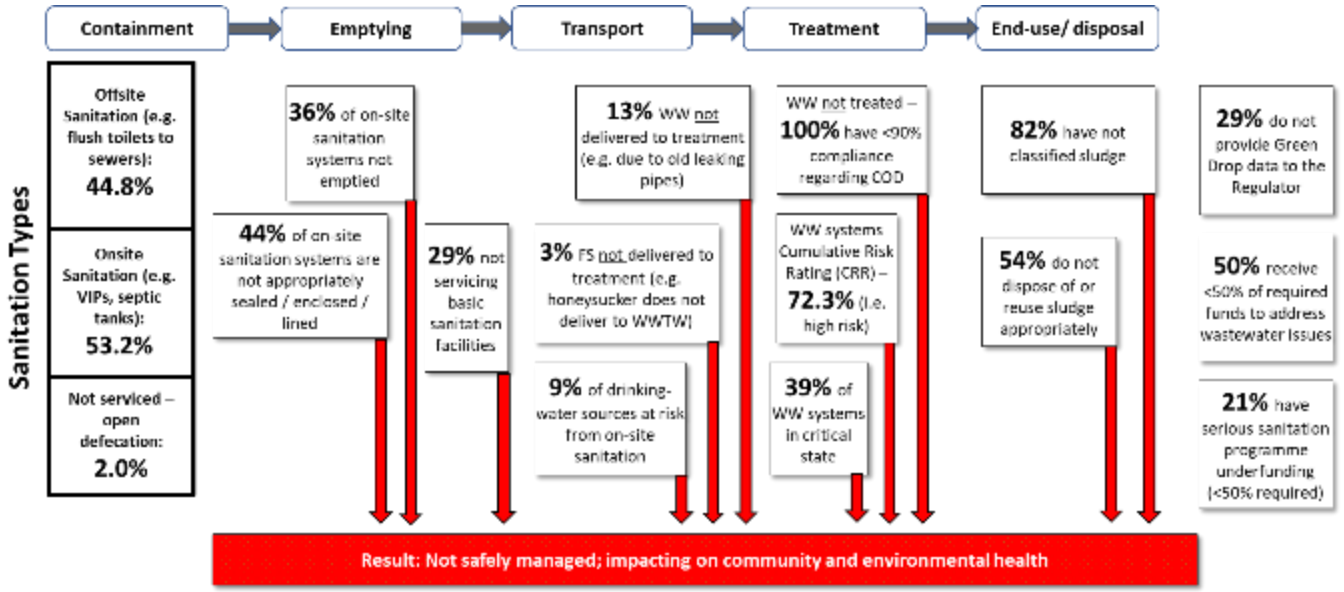


FIGURE 3-8: 1ST ORDER SFD: EASTERN CAPE

3.7 Sanitation status along the service chain

An analysis of the sanitation service chain shows there is much work to do

A total of 15 indicators were selected and analysed to assess the status of the sanitation service chain, focusing on the quality of available data. This includes three indicators for each of the four service chain components, plus three additional indicators addressing institutional aspects. The analysis results for the Eastern Cape, obtained from the situational analysis tool developed as part of the NSIP Project, are presented visually in Figure 3-9 to Figure 3-11. The colour coding used in the analysis indicates effectiveness levels based on predefined scoring criteria. Green signifies that systems are functioning well and meeting expectations, while amber indicates average performance with identified areas for improvement. In contrast, red highlights poor performance or significant issues that require immediate attention. (refer to Appendix B of the Monitoring Framework and Guide for detailed scoring rules). The visual representation in Figure 3-9 provides a comprehensive overview of the sanitation status along the service chain for all the provinces in the country, allowing for quick and easy assessment at a glance.

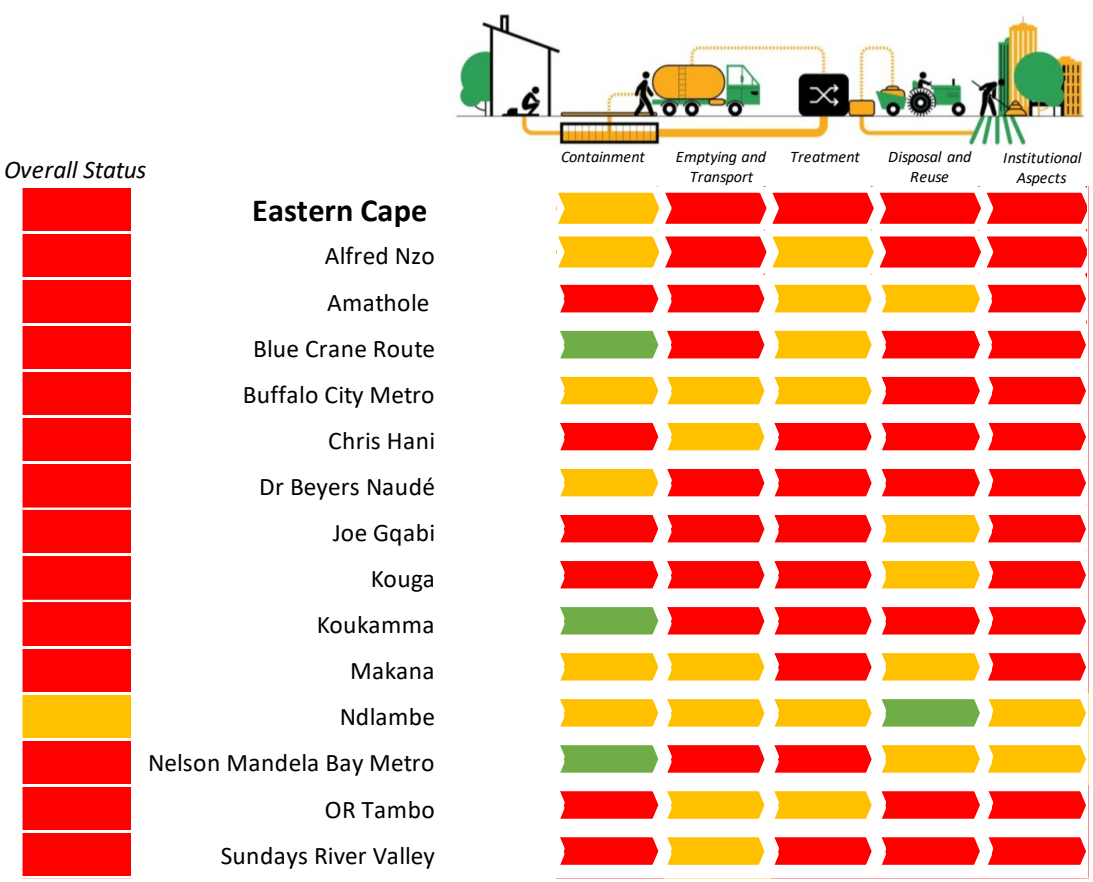


FIGURE 3-9: OVERVIEW OF SANITATION STATUS ALONG THE SERVICE CHAIN FOR WSAS IN THE EASTERN CAPE

Overall score	
>75%	Good
50%-75%	Average
<50%	Poor

- The performance of the Eastern Cape and most WSAs falls short of the desired standard, with just one WSA (Ndlambe) achieving an 'average' overall status.
- Encouragingly, some WSAs showcase good performance in containment efforts (Blue Crane Route, Koukamma and Nelson Mandela Bay Metro), although these remain isolated instances.
- One particular WSA (Ndlambe) stands out for its notable performance in disposal and reuse practices, signalling a positive trend in this aspect.
- Despite these pockets of good performance, the sanitation landscape in the Eastern Cape demands substantial improvement.
- The health of the sanitation service chain is notably deficient, with institutional aspects categorised as 'poor' for the majority of WSAs. Only two WSAs (Ndlambe and Nelson Mandela Bay Metro) managed to attain an 'average' status in this regard.

3.7.1 Heat map: Eastern Cape

The heat map further highlights key deficiencies in the sanitation service chain

The results of the analysis of the 15 indicators are represented for all the WSAs in the Eastern Cape in the heat map in Figure 3-10. Green signifies that systems are functioning well and meeting expectations as defined by the scoring criteria. Amber indicates average performance, suggesting areas that require improvement, while red highlights poor performance or significant issues that require immediate attention. Although there are pockets of good performance, overall, the performance is far from ideal.

Indicator #	Eastern Cape	Alfred Nzo	Amathole	Blue Crane Route	Buffalo City Metro	Chris Hani	Dr Beyers Naudé	Joe Gqabi	Kouga	Koukamma	Makana	Ndlambe	Nelson Mandela Bay Metro	OR Tambo	Sundays River Valley
	Overall sanitation status														
	Containment														
1	No sanitation (backlog) (DWS WSKS) (April 2023)														
2	Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)														
3	Rate of sanitation delivery (backlog eradication)														
	Emptying and Transport														
4	Pit toilet emptying														
5	Vacuum truck / honeysucker needs														
6	Vacuum truck / honeysucker condition														
	Treatment														
7	WWTW design capacity utilised														
8	WWTW effluent quality														
9	WWTW staffing shortfall														
	Disposal and Reuse														
10	Analysis and classification of wastewater sludge Wastewater sludge management														
11	Analysis and classification of faecal sludge Faecal sludge management														
12	Treated wastewater effluent reuse														
	Institutional Aspects														
13	Green Drop performance														
14	Sanitation staff vacancies														
15	Sanitation business financial status														

Green – Good | Amber – Average | Red – Poor

FIGURE 3-10: HEAT MAP SHOWING THE STATUS OF THE 15 INDICATORS FOR WSAS IN THE EASTERN CAPE

3.7.2 Rating WSAs in the Eastern Cape: Sanitation service chain elements

The performance of each of the 15 indicators of the sanitation service chain highlights key deficiencies at WSAs

Using the heat map and total scores of the 15 indicators, each WSA in the Eastern Cape is ranked from poorest-performing on the left to best-performing on the right, as shown in Figure 3-11. WSAs facing significant challenges across the sanitation service chain, including related institutional factors, are marked mostly in red, starting on the far left, while those that are performing well are indicated mostly in green, moving towards the far right.

The 15 sanitation service chain elements that are rated are indicated below:

	Containment
1.	No sanitation (backlog)
2.	Inappropriate sanitation (backlog)
3.	Rate of sanitation delivery (years to eradicate backlog)
	Emptying and transport
4.	Pit toilet emptying
5.	Vacuum truck/honeysucker needs
6.	Vacuum truck/honeysucker condition
	Treatment
7.	WWTW design capacity utilised
8.	WWTW effluent quality
9.	WWTW staffing shortfall
	Disposal and reuse
10.	Analysis and classification of wastewater sludge
	Wastewater sludge management
11.	Analysis and classification of FS
	FSM
12.	Treated wastewater effluent reuse
	Institutional aspects
13.	Green Drop performance (2021)
14.	Sanitation staff vacancies
15.	Sanitation business financial status

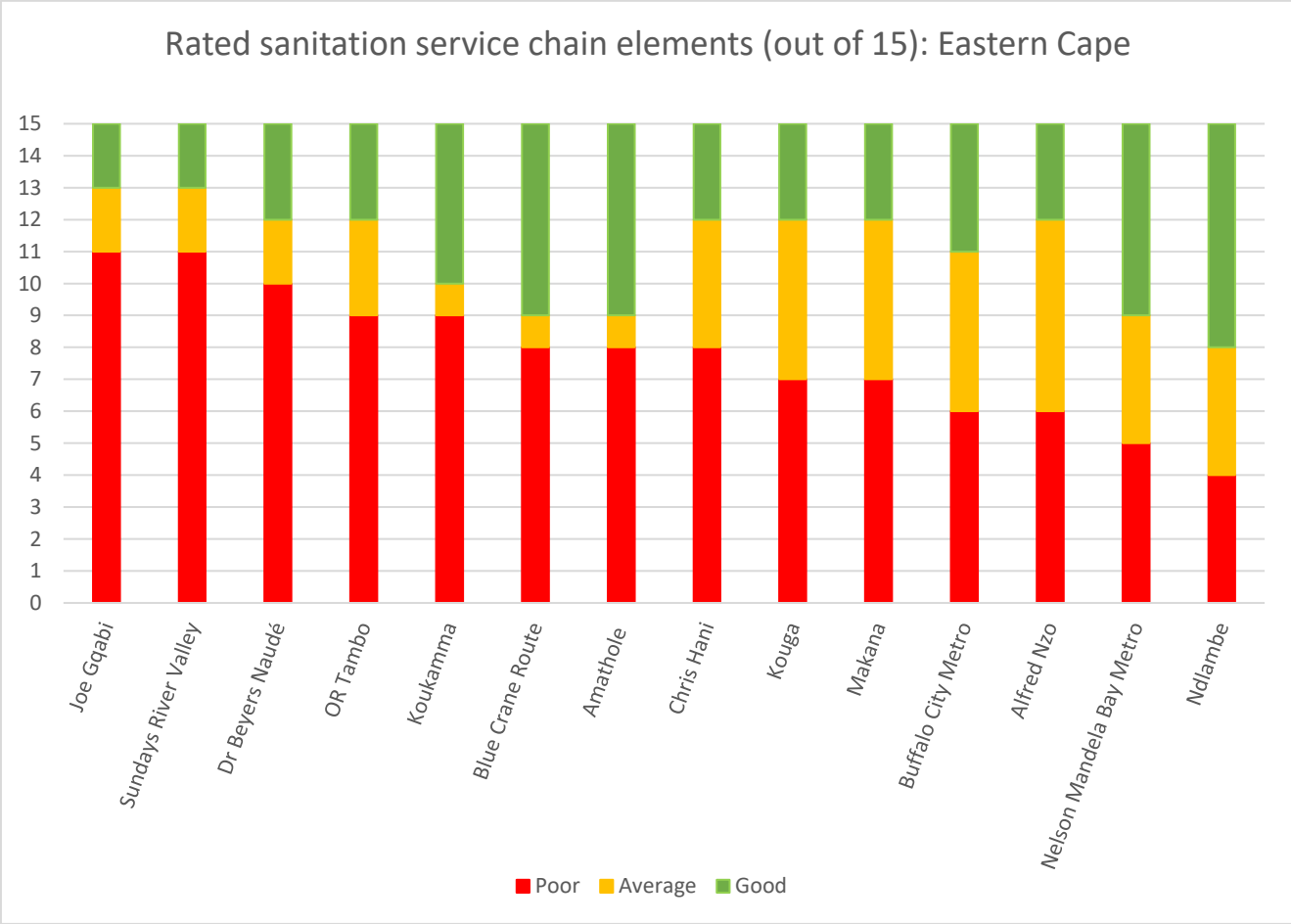


FIGURE 3-11: RATED WSAS IN THE EASTERN CAPE BASED ON THE PERFORMANCE OF THE 15 INDICATORS (LEFTMOST COLUMN = POOREST PERFORMER; RIGHTMOST COLUMN = BEST PERFORMER)

3.8 Key findings: Eastern Cape

Is the Eastern Cape's sanitation in good health?

The analysis below provides a snapshot of the Eastern Cape's sanitation status as of 2022/23.

Overall

The sanitation status of the province can be categorised as 'poor'.

Access to sanitation/Containment

The Eastern Cape has a near-even rural–urban split, with 57% of households in rural areas and 43% in urban areas. Overall, 44% of households in the province are connected to the sewer system, while 51% rely on on-site sanitation. Additionally, 5% of the households have no access to sanitation. Consistent with the general trend across South Africa, urban areas in the Eastern Cape have better access to sewered systems, with 80% of urban households connected to the sewer network. In contrast, rural areas are more dependent on on-site sanitation solutions, with 75% of rural households using on-site sanitation systems.

Bucket and chemical toilets

Although the use of bucket toilets has declined between 2011 and 2023, as of 2023, over 10 000 households in the province continue to rely on bucket toilets. In contrast to the overall trend of increasing use of chemical toilets in other provinces, the Eastern Cape has experienced a slight decline in the number of households using chemical toilets since 2019. Nevertheless, as of 2023, more than 137 000 households in the province are still served by chemical toilets (DWS, 2023b). The continued use of bucket toilets and the increasing reliance on chemical toilets contribute to the ongoing 'inappropriate sanitation' backlog across WSAs in the province. These types of sanitation solutions, while providing a temporary alternative, do not meet the standards of more permanent and hygienic sanitation infrastructure.

Sanitation backlog

Overall, the Eastern Cape is not on track to meet sector targets by 2030 (e.g. SDG 6.2).

Five WSAs (Amathole, Chris Hani, Joe Gqabi, Ndlambe and OR Tambo) have a 'no service' backlog exceeding 5%, which is categorised as 'poor'. Five WSAs (Amathole, Chris Hani, Joe Gqabi, OR Tambo and Sundays River) have an 'inappropriate sanitation' backlog exceeding 20%, also categorised as 'poor'. Two WSAs (Blue Crane Route and Kou Kamma) have already eradicated their sanitation backlog. Given the current rate of sanitation delivery (years to eradicate backlog), it is highly unlikely that seven WSAs (Alfred Nzo, Amathole, Chris Hani, Joe Gqabi, Ndlambe, Nelson Mandela Bay and OR Tambo) will eradicate their backlog by 2030.

Emptying and transport

Eight WSAs (Alfred Nzo, Amathole, Blue Crane, Dr Beyers Naude, Joe Gqabi, Kouga, Koukamma and Nelson Mandela Bay Metro) indicated that they do not empty pits. This means that users need to empty their own pits, dig their own new pits, or resort to other means. WSAs need to ensure that users are aware of appropriate safety and hygiene measures to follow.

Nine WSAs (Amathole, Blue Crane Route, Buffalo City, Dr Beyers Naude, Joe Gqabi, Koukamma, Nelson Mandela Bay, OR Tambo and Sundays River) indicated a significant shortage of vacuum trucks and honeysuckers, with their need exceeding 100% of their current fleet (i.e. they need to at least double their fleet). This result also seems to indicate that pit-emptying could currently be limited by the number of vacuum trucks and honeysuckers available.

Furthermore, the condition of most of the existing vacuum trucks and honeysuckers is far from ideal, with five WSAs (Blue Crane Route, Dr Beyers Naude, Koukamma, Ndlambe and Nelson Mandela Bay) indicating that they are in poor condition. This implies that breakdowns are inevitable and indicates a further vulnerability in emptying and transport.

Treatment

Most WSAs appear to utilise the wastewater treatment works (WWTWs) within their design capacity. However, three WSAs (Joe Gqabi, Makana and Sundays River) have WWTWs where the design capacity is exceeding 90% utilisation. Despite the spare treatment capacity, the performance of many WWTWs is not ideal, with twelve WSAs (Alfred Nzo, Amathole, Blue Crane Route, Chris Hani, Dr Beyers Naudé, Joe Gqabi, Kouga, Koukamma, Makana, Nelson Mandela Bay Metro, OR Tambo, Sundays River Valley) having a treated effluent quality with an overall compliance of less than 50%.

Most WSAs indicated a significant challenge with WWTW staffing, with 10 WSAs (Buffalo City Metro, Chris Hani, Dr Beyers Naudé, Joe Gqabi, Kouga, Koukamma, Makana, Ndlambe, Nelson Mandela Bay Metro, Sundays River Valley) indicating an overall WWTW staffing shortfall greater than 35%. This could contribute to the noted performance challenges.

Disposal and reuse

Seven WSAs (Blue Crane Route, Buffalo City Metro, Dr Beyers Naudé, Joe Gqabi, Koukamma, OR Tambo, Sundays River Valley) scored poorly for wastewater sludge management as they do not analyse and classify their wastewater sludge and/or do not proactively manage their sludge end-use or disposal.

Eleven WSAs (Alfred Nzo, Amathole, Blue Crane Route, Buffalo City Metro, Chris Hani, Dr Beyers Naudé, Kouga, Koukamma, Makana, OR Tambo, Sundays River Valley) do not reuse treated wastewater effluent for any purpose. This lack of reuse could be because of the poor quality of treated effluent.

Institutional aspects

Eleven WSAs (Alfred Nzo, Blue Crane Route, Chris Hani, Dr Beyers Naudé, Joe Gqabi, Kouga, Koukamma, Makana, Ndlambe, OR Tambo, Sundays River Valley) have very poor Green Drop performance, scoring less than 50%.

Ten WSAs (Alfred Nzo, Amathole, Blue Crane Route, Chris Hani, Joe Gqabi, Kouga, Koukamma, Nelson Mandela Bay, OR Tambo and Sundays River Valley) have significant sanitation staff challenges, with sanitation staff vacancies of more than 35%.

Eleven WSAs (Alfred Nzo, Amathole, Blue Crane Route, Buffalo City Metro, Chris Hani, Dr Beyers Naudé, Joe Gqabi, Koukamma, Makana, OR Tambo and Sundays River Valley) indicated that the financial status of their sanitation business is far from ideal and is running at a deficit.

Photo: Shubham Kumar on Unsplash

4 Situational analysis: Free State

This section provides a summary of data and findings from the **Free State Situational Analysis** report.

For access to the full report, scan the QR code above.

What is the current reality in the province?

4.1 Free State overview

Water services authorities

WSAs are responsible for supplying both water and sanitation services to households in their area of jurisdiction. In the Free State, there are:

- 1 metropolitan municipality
- 4 district municipalities
- 18 local municipalities
- 19 WSAs

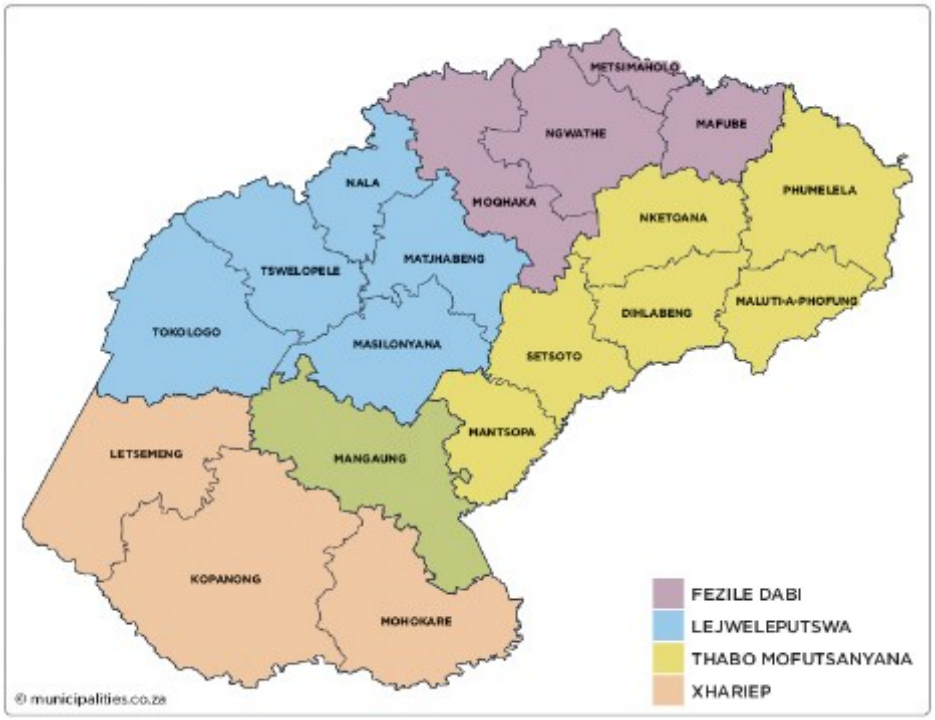


FIGURE 4-1: MUNICIPALITIES AND WSAS IN THE FREE STATE

Metropolitan municipalities
Mangaung*

District municipalities
Fezile Dabi
Lejweleputswa
Thabo Mofutsanyana
Xhariep

Local municipalities	
Dihlabeng*	Mohokare*
Kopanong*	Moqhaka*
Letsemeng*	Nala*
Mafube*	Ngwathe*
Maluti-a-Phofung*	Nketoana*
Mantsopa*	Phumelela*
Masilonyana*	Setsoto*
Matjhabeng*	Tokologo*
Metsimaholo*	Tswelopele*

(* indicates WSA)

4.2 Access to sanitation: Households

Sanitation service levels per household: A provincial view

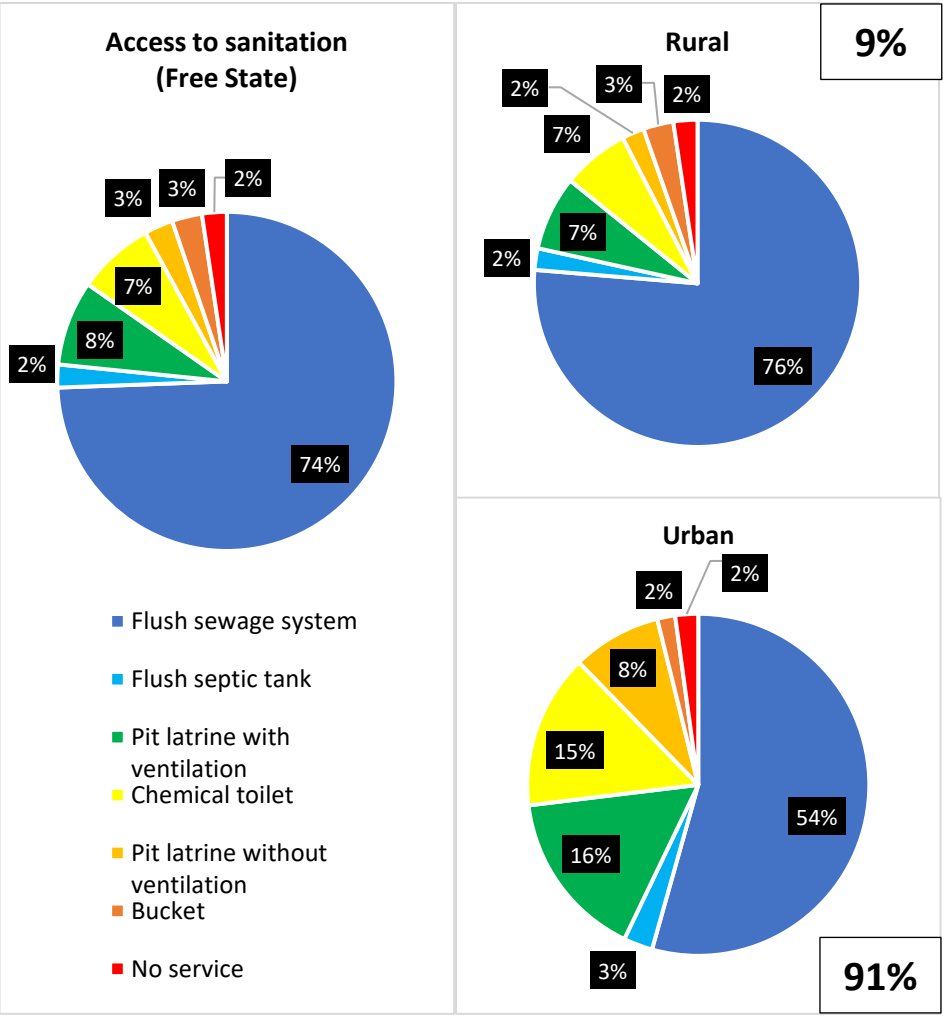


FIGURE 4-2: SANITATION SERVICE LEVELS PER HOUSEHOLD IN THE FREE STATE

An analysis of sanitation provision by settlement type (see Figure 4-2 and Table 4-2) depicts a total number of 1 052 716 households in the Free State, of which 91 109 (9%) are rural settlements and 961 607 (91%) urban settlements (DWS, 2022b).

The data shows that provincially:

- **74%** of households have access to a flush toilet connected to the sewage system.
- **2%** of households do not have access to sanitation (implying open defecation).
- The remaining **24%** of households utilise some form of on-site sanitation system, including septic tanks (2%), pit latrines with ventilation (i.e. VIPs) (8%), chemical toilets (7%), pit latrines without ventilation (3%) and bucket latrines (3%).

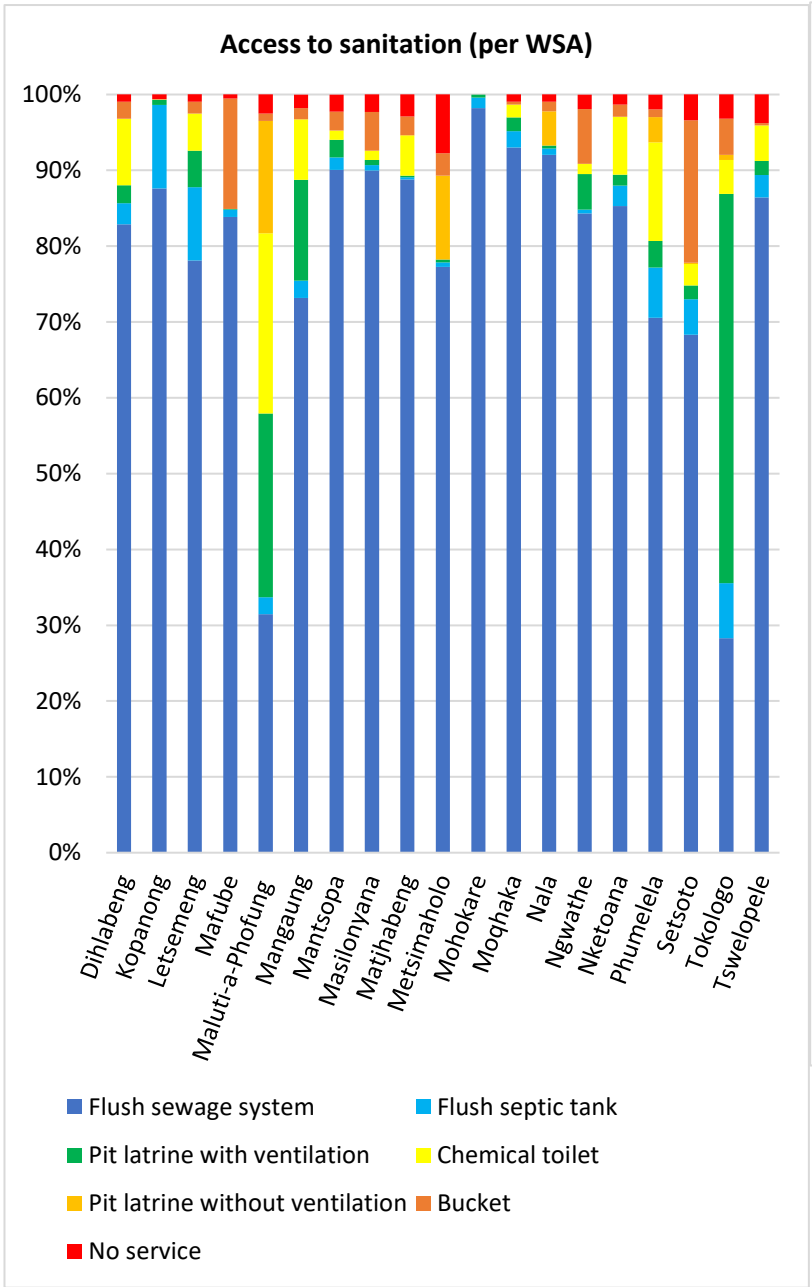
In rural settlements:

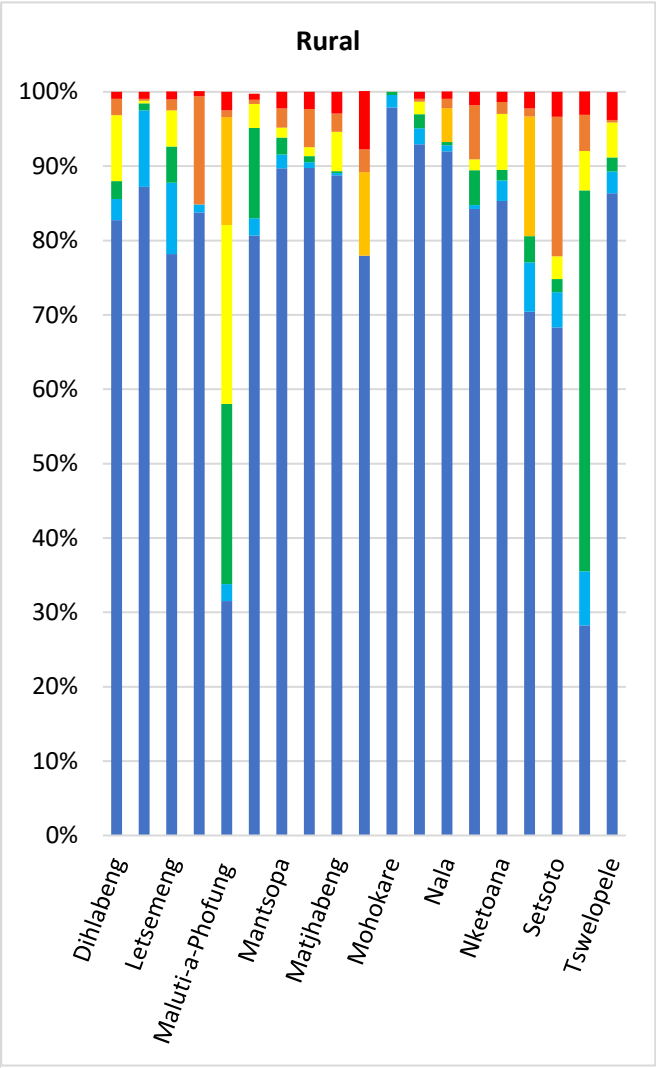
- **54%** of households have access to a flush toilet connected to the sewage system.
- **2%** of households do not have access to sanitation (implying open defecation).
- The remaining **44%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (16%), chemical toilets (15%), pit latrines without ventilation (8%) and bucket latrines (2%).

In urban settlements:

- **76%** of households have access to a flush toilet connected to the sewage system.
- **2%** of households do not have access to sanitation (implying open defecation).
- The remaining **22%** of households utilise some form of on-site sanitation system, including septic tanks (2%), pit latrines with ventilation (i.e. VIPs) (7%), chemical toilets (7%), pit latrines without ventilation (2%) and bucket latrines (3%).

The analysis of sanitation provision by settlement type at the WSA level in the Free State is depicted in Figure 4-3 and detailed in Table 4-1 and Table 4-2.





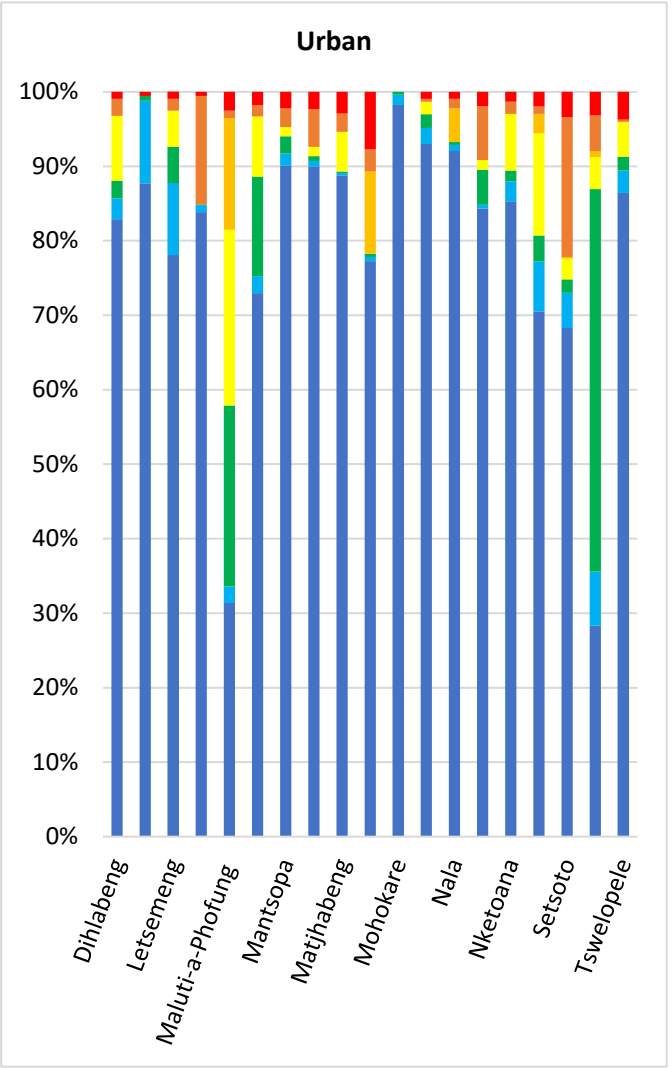


FIGURE 4-3: SANITATION SERVICE LEVELS PER HOUSEHOLD IN 19 WSAS IN THE FREE STATE

TABLE 4-1: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN THE FREE STATE (1)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Dihlabeng	51 536		42 720	83	1 434	3	1 219	2	4 495	9	20	0	1 158	2	490	1
Rural	1 905	4	1 576	83	54	3	46	2	169	9	0	0	42	2	18	1
Urban	49 631	96	41 144	83	1 380	3	1 173	2	4 326	9	20	0	1 116	2	472	1
Kopanong	20 257		17 749	88	2 226	11	137	1	11	0	0	0	9	0	126	1
Rural	3 256	16	2 840	87	335	10	31	1	11	0	0	0	9	0	30	1
Urban	17 001	84	14 909	88	1 891	11	106	1	0	0	0	0	0	0	96	1
Letsemeng	15 370		12 002	78	1 488	10	744	5	747	5	0	0	240	2	154	1
Rural	2 588	17	2 023	78	249	10	126	5	126	5	0	0	37	1	28	1
Urban	12 782	83	9 979	78	1 239	10	618	5	621	5	0	0	203	2	126	1
Mafube	20 615		17 285	84	197	1	17	0	0	0	0	0	3 003	15	113	1
Rural	998	5	836	84	11	1	0	0	0	0	0	0	145	15	7	1
Urban	19 617	95	16 449	84	186	1	17	0	0	0	0	0	2 858	15	106	1
Maluti-a-Phofung	133 244		41 894	31	2 993	2	32 302	24	31 687	24	19 725	15	1 277	1	3 369	3
Rural	50 304	38	15 864	32	1 137	2	12 193	24	12 101	24	7 297	15	451	1	1 262	3
Urban	82 940	62	26 030	31	1 856	2	20 109	24	19 586	24	12 428	15	826	1	2 107	3
Mangaung	292 078		213 719	73	6 658	2	38 879	13	23 274	8	0	0	4 335	1	5 194	2
Rural	7 379	3	5 953	81	171	2	896	12	238	3	0	0	42	1	60	1
Urban	284 699	97	207 766	73	6 487	2	37 983	13	23 036	8	0	0	4 293	2	5 134	2
Mantsopa	18 643		16 787	90	311	2	430	2	231	1	0	0	465	2	417	2
Rural	1 207	6	1 083	90	22	2	28	2	16	1	0	0	31	3	27	2
Urban	17 436	94	15 704	90	289	2	402	2	215	1	0	0	434	2	390	2
Masilonyana	23 710		21 337	90	170	1	157	1	289	1	0	0	1 211	5	547	2
Rural	1 639	7	1 471	90	13	1	13	1	20	1	0	0	84	5	38	2
Urban	22 071	93	19 866	90	157	1	144	1	269	1	0	0	1 127	5	509	2
Matjhabeng	164 091		145 721	89	442	0	388	0	8 662	5	78	0	4 021	2	4 778	3
Rural	2 498	2	2 218	89	7	0	6	0	133	5	0	0	61	2	73	3
Urban	161 593	98	143 503	89	435	0	382	0	8 529	5	78	0	3 960	2	4 705	3
Metsimaholo	65 026		50 242	77	381	1	258	0	0	0	7 180	11	1 934	3	5 031	8
Rural	944	1	736	78	0	0	0	0	0	0	106	11	29	3	74	8
Urban	64 082	99	49 506	77	381	1	258	0	0	0	7 074	11	1 905	3	4 957	8

TABLE 4-2: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN THE FREE STATE (2)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Mohokare	13 622		13 378	98	192	1	51	0	0	0	0	0	0	0	0	0
Rural	1 567	12	1 534	98	26	2	7	0	0	0	0	0	0	0	0	0
Urban	12 055	88	11 844	98	166	1	44	0	0	0	0	0	0	0	0	0
Moqhaka	58 965		54 834	93	1 268	2	1 093	2	980	2	0	0	237	0	553	1
Rural	2 249	4	2 090	93	49	2	42	2	38	2	0	0	9	0	21	1
Urban	56 716	96	52 744	93	1 219	2	1 051	2	942	2	0	0	228	0	532	1
Nala	26 016		23 950	92	210	1	103	0	0	0	1 172	5	333	1	249	1
Rural	3 083	12	2 836	92	25	1	14	0	0	0	140	5	39	1	30	1
Urban	22 933	88	21 114	92	185	1	89	0	0	0	1 032	5	294	1	219	1
Ngwathe	45 006		37 948	84	232	1	2 101	5	604	1	0	0	3 256	7	864	2
Rural	2 337	5	1 969	84	12	1	110	5	34	1	0	0	170	7	42	2
Urban	42 669	95	35 979	84	220	1	1 991	5	570	1	0	0	3 086	7	822	2
Nketoana	21 630		18 450	85	580	3	316	1	1 646	8	0	0	348	2	292	1
Rural	2 204	10	1 881	85	60	3	32	1	166	8	0	0	35	2	30	1
Urban	19 426	90	16 569	85	520	3	284	1	1 480	8	0	0	313	2	262	1
Phumelela	16 038		11 312	71	1 069	7	560	3	2 083	13	534	3	164	1	315	2
Rural	845	5	595	70	56	7	30	4	0	0	136	16	9	1	19	2
Urban	15 193	95	10 717	71	1 013	7	530	3	2 083	14	398	3	155	1	296	2
Setsoto	40 975		27 985	68	1 926	5	740	2	1 158	3	78	0	7 693	19	1 399	3
Rural	1 370	3	936	68	65	5	24	2	42	3	0	0	257	19	46	3
Urban	39 605	97	27 049	68	1 861	5	716	2	1 116	3	78	0	7 436	19	1 353	3
Tokologo	10 819		3 063	28	784	7	5 554	51	485	4	74	1	515	5	345	3
Rural	1 735	16	490	28	126	7	889	51	92	5	0	0	84	5	55	3
Urban	9 084	84	2 573	28	658	7	4 665	51	393	4	74	1	431	5	290	3
Tswelopele	15 075		13 027	86	450	3	278	2	707	5	0	0	46	0	567	4
Rural	3 001	20	2 592	86	88	3	56	2	141	5	0	0	10	0	113	4
Urban	12 074	80	10 435	86	362	3	222	2	566	5	0	0	36	0	454	4
Free State	**1 052 716**		**783 403**	**74**	**23 011**	**2**	**85 327**	**8**	**77 059**	**7**	**28 861**	**3**	**30 245**	**3**	**24 803**	**2**
Rural	**91 109**	**9**	**49 523**	**54**	**2 506**	**3**	**14 543**	**16**	**13 327**	**15**	**7 679**	**8**	**1 544**	**2**	**1 973**	**2**
Urban	**961 607**	**91**	**733 880**	**76**	**20 505**	**2**	**70 784**	**7**	**63 732**	**7**	**21 182**	**2**	**28 701**	**3**	**22 830**	**2**

4.3 Bucket and chemical toilets in the Free State

Are bucket toilets still in use?

Bucket toilets should have already been eradicated in South Africa. Yet, as of 2023, there are still more than 30 000 households in the Free Sate using bucket toilets (DWS, 2023b), as illustrated in Figure 4-4.

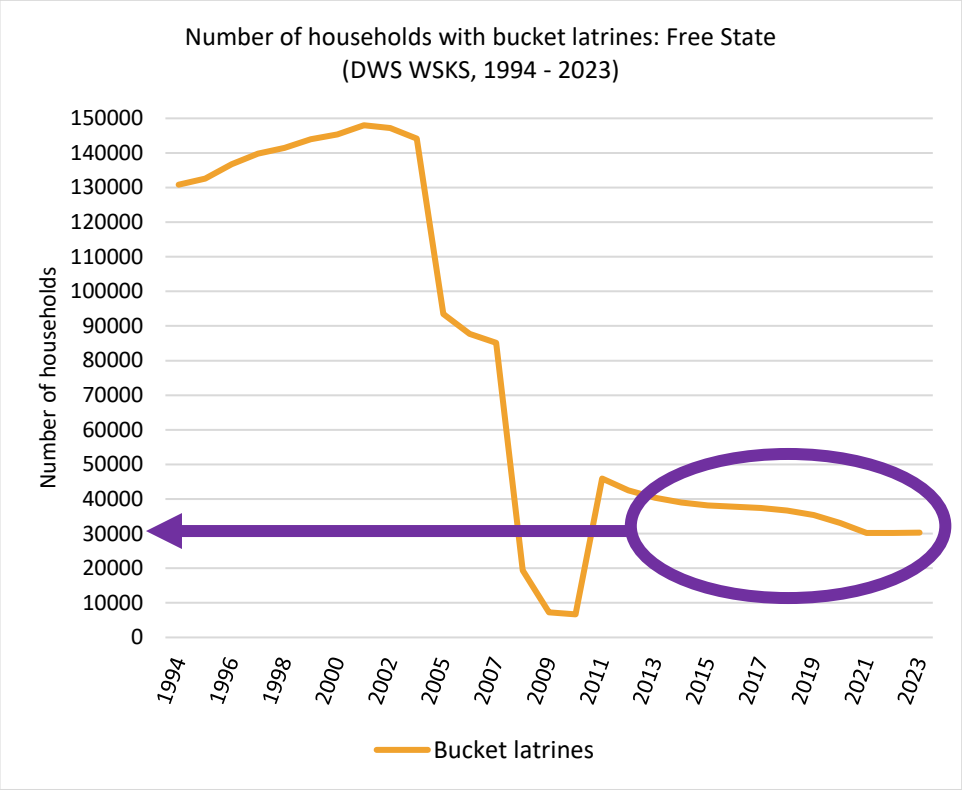


FIGURE 4-4: NUMBER OF HOUSEHOLDS WITH BUCKET LATRINES IN THE FREE STATE FROM 1994 TO 2023

Are chemical toilets an issue?

Currently, more than 77 000 households in the Free State are served by chemical toilets (DWS, 2023b), as illustrated in Figure 4-5. Can the province afford this?

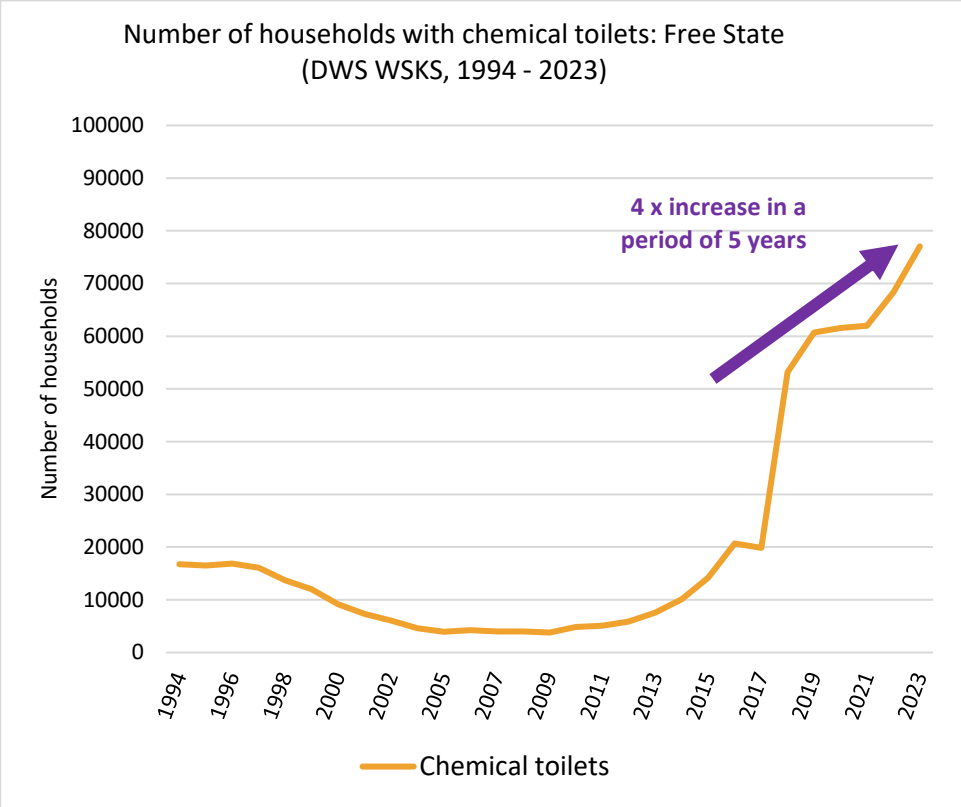


FIGURE 4-5: NUMBER OF HOUSEHOLDS WITH CHEMICAL TOILETS IN THE FREE STATE FROM 1994 TO 2023

Assuming 2.5 households are served per chemical toilet (i.e. ~10 people per toilet, ~30 800 chemical toilets in operation), and chemical toilet rental costs of R750/month, this equates to a cost of **~R23 million/month** or **~R277 million/year**.

Could innovative sanitation alternatives meet the same needs (or perform even better) at a lower cost?

4.4 Progress on eradicating sanitation backlog

Is the Free State on target to eradicate sanitation backlogs?

WSAs with a significant overall backlog (i.e. inappropriate sanitation systems and no sanitation systems) include Maluti-a-Phofung (42%), Setsoto (25%), and Metsimaholo (22%). Mohokare has no sanitation backlog. Figure 4-6 shows the percentage of appropriate, inappropriate and unacceptable sanitation for each WSA in the Free State, as well as the overall statistics for the province.

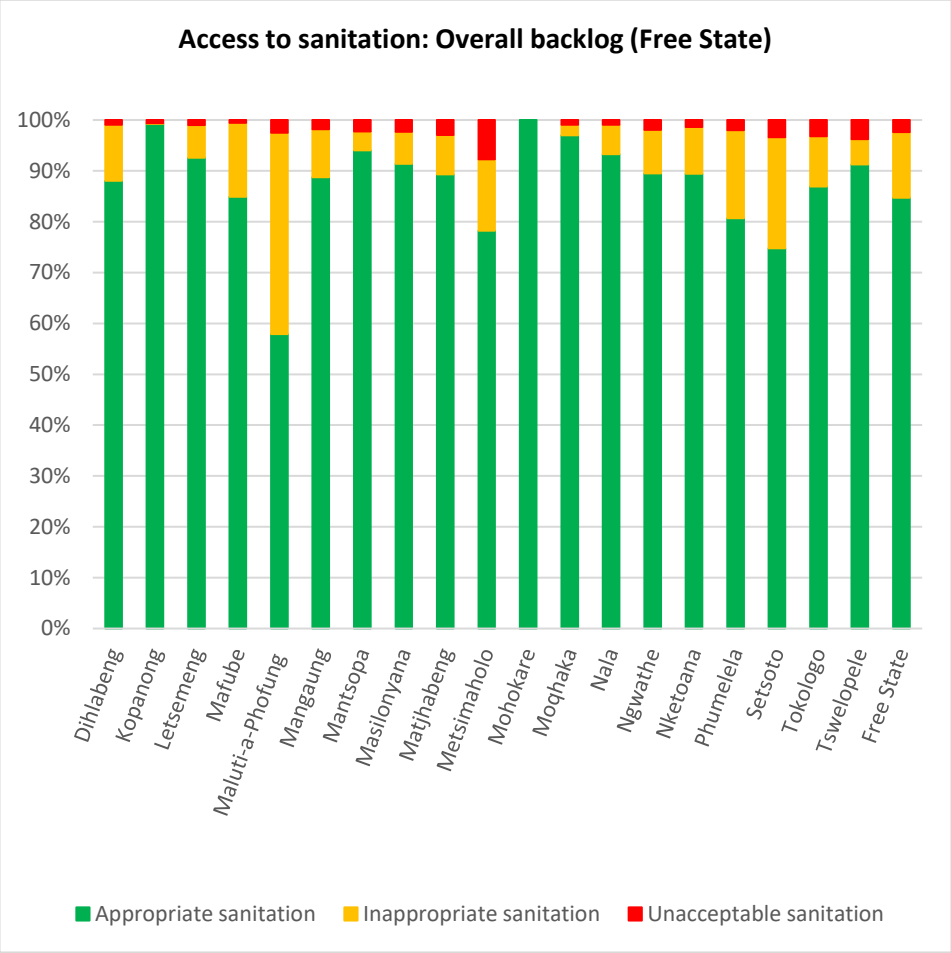


FIGURE 4-6: ACCESS TO SANITATION AND OVERALL BACKLOG IN THE FREE STATE

TABLE 4-3: RATE OF SANITATION DELIVERY AND LIKELIHOOD OF WSAS IN THE FREE STATE TO ACHIEVE BACKLOG ERADICATION

Rate of delivery (years to eradicate backlog)(as of 2021)	End date	Years to achieve	Rate of delivery (years to eradicate backlog)(as of 2021)	End date	Years to achieve
Dihlabeng	2027	6	Matjhabeng	2031	10
Kopanong	2027	6	Metsimaholo	2024	3
Letsemeng	2035	14	Moqhaka	2024	3
Mafube	2022	1	Nala	2023	2
Mahokare	2035	14	Ngwathe	2028	7
Maluti-a-Phofong	2037	16	Nketoana	2031	10
Mangaung	2032	11	Phumelela	2024	3
Mantsopa	2024	3	Setsoto	2033	12
Masilonyana	2069	48			

NOTE: The figures above were calculated in 2021. Has there been progress since then? Has the rate of sanitation service delivery (i) increased, (ii) stayed the same, or (iii) decreased? Understanding (a) sanitation backlog and (b) the rate of sanitation service delivery will help to determine if WSAs are on track to meet sanitation access-related SDGs.

From Table 4-3 above:

- 11 WSAs have a good chance of eradicating their backlog by 2030 (green). Three WSAs are likely to make progress but are likely to eradicate backlogs only partially (amber). Five WSAs are not addressing their backlogs quickly enough and are unlikely to achieve backlog eradication.

4.5 Municipal sanitation status: Free State

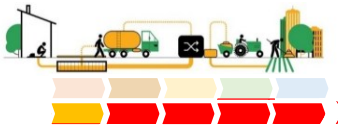
Where is the Free State doing well?

Although access to sanitation has improved since 1994, the status of containment has been categorised as 'average', while emptying and transport, treatment, and disposal and reuse have been categorised as 'poor' for the Free State province. The analysis has shown that the health of the sanitation service chain is far from ideal. It is not surprising that institutional aspects are also categorised as 'poor'. There appears to be little innovation or value add related to the sanitation sector in the province. Challenges are compounded by growing informal settlements. Unfortunately, there is much work to do to improve sanitation in the province.

water & sanitation
Department: Water and Sanitation
REPUBLIC OF SOUTH AFRICA

National Sanitation Integrated Plan

Provincial Status Report
Free State



Provincial Status
Poor

National Status

Total Provinces
9

			Data Set (indicates number of WSAs with data submitted)
Context			
Population (DWS WSKS) (April 2023)	2953485		19 / 19
Number of households (DWS WSKS) (April 2023)	1052716	HH	19 / 19
Number of wastewater treatment works	96		19 / 19
Number of sewer pump stations	287		19 / 19
Length of sewer pipelines	1995	km	5 / 19
Containment		**Average**	
1.1 No sanitation (backlog) (DWS WSKS) (April 2023)	2	% HH	Average 19 / 19
1.2 Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)	15	% HH	Average 19 / 19
1.3 Average rate of sanitation delivery (years to eradicate backlog)	9	years	Average 19 / 19
Emptying and Transport		**Poor**	
2.1 Sewer network condition	NI		0 / 19
2.2 Pit toilet emptying	79	% of WSAs	Good 19 / 19
2.3 Vacuum truck / honeysucker needs	70	trucks	Poor 19 / 19
2.4 Vacuum truck / honeysucker condition	42	% in fair condition	Poor 15 / 19
Treatment		**Poor**	
3.1 % of wastewater treatment works design capacity utilised	53	%	Average 15 / 19
3.1.1 Design capacity	457.9	Ml/d	19 / 19
3.1.2 Available capacity	365.7	Ml/d	14 / 19
3.1.3 Operational capacity	243.5	Ml/d	11 / 19
3.2 Wastewater treatment works effluent quality	16	% compliance	Poor 19 / 19
3.2.1 Microbiological compliance	11	%	19 / 19
3.2.2 Chemical compliance	17	%	19 / 19
3.2.3 Physical compliance	21	%	19 / 19
3.3 Wastewater treatment works staffing shortfall	74	%	Poor 19 / 19
3.3.1 Number of supervisor(s): Compliant	10		19 / 19
3.3.2 Number of supervisor(s): Shortfall	26		19 / 19
3.3.3 Number of PC(s): Compliant	58		19 / 19
3.3.4 Number of PC(s): Shortfall	165		19 / 19
Disposal and Reuse		**Poor**	
4.1 Analysis and classification of wastewater sludge	26	% of WSAs	Poor 17 / 19
4.2 Wastewater sludge management	5	% acceptable practices	17 / 19
4.3 Analysis and classification of faecal sludge	16	% of WSAs	Poor 17 / 19
4.4 Faecal sludge management	89	% acceptable practices	19 / 19
4.5 Treated wastewater effluent reuse	26	% of WSAs	Poor 18 / 19
Institutional Aspects		**Poor**	
5.1 Green Drop performance (2021)	26	%	Poor 19 / 19
5.2 Sanitation staff vacancies	48	%	Poor 15 / 19
5.3 Sanitation business financial status	63	% of WSAs operate a deficit	Poor 16 / 19
5.4 Growing informal settlements	26	% of WSAs	14 / 19
5.5 Shit-flow diagrams developed for sanitation systems	0	% of WSAs	17 / 19
5.6 Alternative/innovative sanitation processes or technologies implemented	32	% of WSAs have implement multiple	19 / 19
5.6.1 Toilets	*21*	% of WSAs	18 / 19
5.6.2 Emptying	*16*	% of WSAs	16 / 19
5.6.3 Transport	*21*	% of WSAs	18 / 19
5.6.4 Treatment	*42*	% of WSAs	18 / 19
5.6.5 Disposal benefication	*16*	% of WSAs	17 / 19
5.6.6 New business models	*21*	% of WSAs	15 / 19

FIGURE 4-7: SANITATION STATUS IN THE FREE STATE

4.6 1st order excreta flow diagram (SFD): Free State

What are some of the contributors to poor sanitation performance?

The 1st order SFD for Free State (Figure 4-8) highlights significant gaps in the sanitation service chain. These deficiencies all potentially have a negative impact on communities (e.g. water supply) and the environment (e.g. water sources).

Containment:

- Inappropriately constructed on-site sanitation systems (i.e. unsealed or unlined)

Emptying and transport:

- Some lost sewage due to old and leaking pipes
- Inadequate maintenance and servicing of basic sanitation systems at some WSAs (e.g. not emptied)

Treatment:

- Poorly operated, maintained and managed WWTWs resulting in poor performance or non-compliance

End-use or disposal:

- Inadequate sludge analysis and classification, and resultant inappropriate sludge disposal and/or non-beneficial use

Institutional:

- Inadequate sanitation systems or programme funding

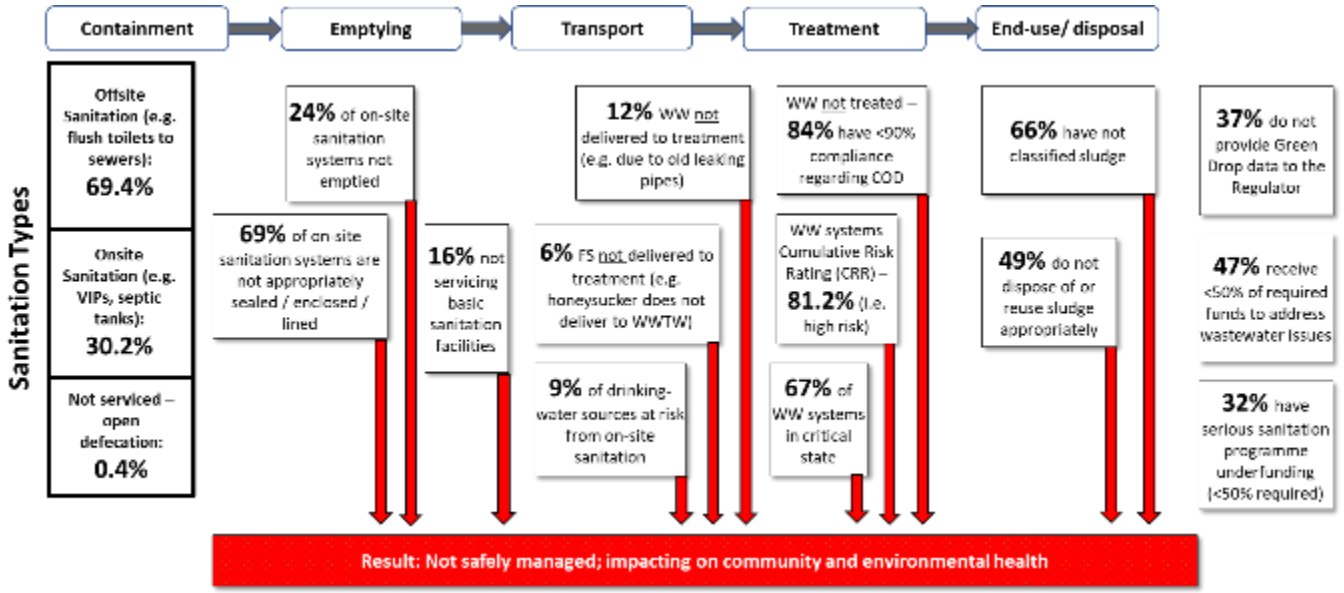


FIGURE 4-8: 1ST ORDER SFD: FREE STATE

4.7 Sanitation status along the service chain

An analysis of the sanitation service chain shows there is much work to do

A total of 15 indicators were selected and analysed to assess the status of the sanitation service chain, focusing on the quality of available data. This includes three indicators for each of the four service chain components, plus three additional indicators addressing institutional aspects. The analysis results for the Free State, obtained from the situational analysis tool developed as part of the NSIP Project, are presented visually in Figure 4-9 to Figure 4-11. The colour coding used in the analysis indicates effectiveness levels based on predefined scoring criteria. Green signifies that systems are functioning well and meeting expectations, while amber indicates average performance with identified areas for improvement. In contrast, red highlights poor performance or significant issues that require immediate attention (refer to Appendix B of the Monitoring Framework and Guide for detailed scoring rules). The visual representation in Figure 4-9 provides a comprehensive overview of the sanitation status along the service chain for all provinces in the country, allowing for quick and easy assessment at a glance.

FIGURE 4-9: OVERVIEW OF SANITATION STATUS ALONG THE SERVICE CHAIN FOR WSAS IN THE FREE STATE

Overall score	
>75%	Good
50%-75%	Average
<50%	Poor

- The overall performance of the Free State and all WSAs falls short of the desired standard.
- Despite not being at the desired level, containment efforts seem to be adequately managed by most WSAs.
- The health of the sanitation service chain is far from ideal, with emptying and transport, disposal and reuse, as well as institutional aspects categorised as 'poor' for the majority of WSAs.
- Notably, all WSAs scored poorly for treatment practices.
- Significant efforts are still required to enhance sanitation practices in the Free State.

4.7.1 Heat map: Free State

The heat map further highlights key deficiencies in the sanitation service chain

The results of the analysis of the 15 indicators are represented for all the WSAs in the Free State in the heat map in Figure 4-10. Green signifies that systems are functioning well and meeting the expectations defined by the scoring criteria. Amber indicates average performance, suggesting areas that require improvement, while red highlights poor performance or significant issues that demand immediate attention. Although there are pockets of good performance, overall, the performance is far from ideal.

Indicator #	Free State	Dihlabeng	Kopanong	Letsemeng	Mafube	Maluti-a-Phofung	Mangaung	Mantsopa	Masilonyana	Matjhabeng	Metsimaholo	Mohokare	Moqhaka	Nala	Ngwathe	Nketoana	Phumelela	Setsoto	Tokologo	Tswelopele
	Overall sanitation status																			
	Containment																			
1	No sanitation (backlog) (DWS WSKS) (April 2023)																			
2	Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)																			
3	Rate of sanitation delivery (backlog eradication)																			
	Emptying and Transport																			
4	Pit toilet emptying																			
5	Vacuum truck / honeysucker needs																			
6	Vacuum truck / honeysucker condition																			
	Treatment																			
7	WWTW design capacity utilised																			
8	WWTW effluent quality																			
9	WWTW staffing shortfall																			
	Disposal and Reuse																			
10	Analysis and classification of wastewater sludge Wastewater sludge management																			
11	Analysis and classification of faecal sludge Faecal sludge management																			
12	Treated wastewater effluent reuse																			
	Institutional Aspects																			
13	Green Drop performance																			
14	Sanitation staff vacancies																			
15	Sanitation business financial status																			

Green – Good | Amber – Average | Red – Poor

FIGURE 4-10: HEAT MAP SHOWING THE STATUS OF THE 15 INDICATORS FOR WSAS IN THE FREE STATE

4.7.2 Rating WSAs in the Free State: Sanitation service chain elements

The performance of each of the 15 indicators of the sanitation service chain highlights key deficiencies at WSAs

Using the heat map and total scores of the 15 indicators, each WSA in the Free State is ranked from poorest-performing on the left to best-performing on the right, as shown in Figure 4-11. WSAs facing significant challenges across the sanitation service chain, including related institutional factors, are marked mostly in red, starting on the far left, while those that are performing well are indicated mostly in green, moving towards the far right.

The 15 sanitation service chain elements that are rated are indicated below:

	Containment
1.	No sanitation (backlog)
2.	Inappropriate sanitation (backlog)
3.	Rate of sanitation delivery (years to eradicate backlog)
	Emptying and transport
4.	Pit toilet emptying
5.	Vacuum truck/honeysucker needs
6.	Vacuum truck/honeysucker condition
	Treatment
7.	WWTW design capacity utilised
8.	WWTW effluent quality
9.	WWTW staffing shortfall
	Disposal and reuse
10.	Analysis and classification of wastewater sludge
	Wastewater sludge management
11.	Analysis and classification of FS
	FSM
12.	Treated wastewater effluent reuse
	Institutional aspects
13.	Green Drop performance (2021)
14.	Sanitation staff vacancies
15.	Sanitation business financial status

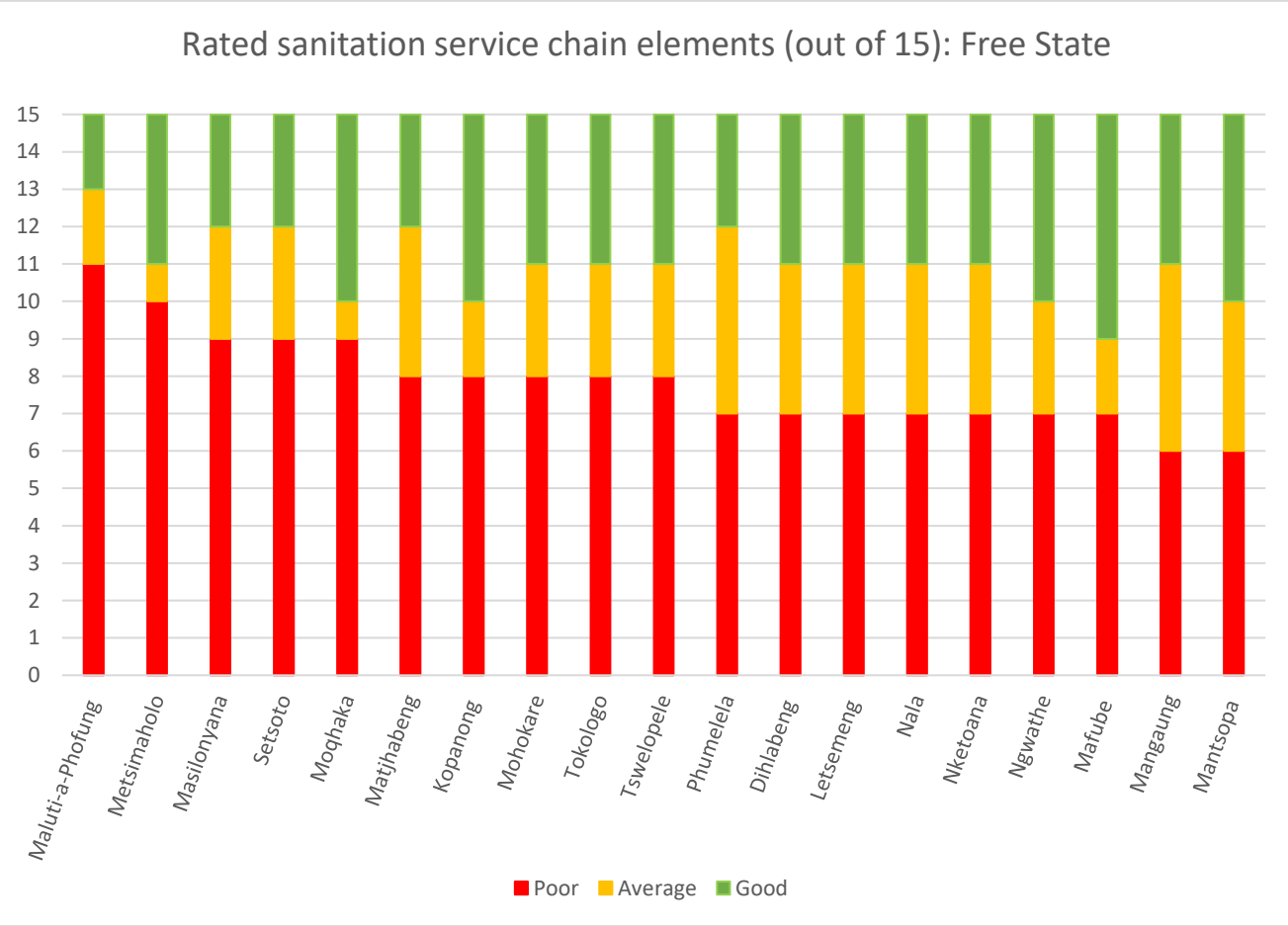


FIGURE 4-11: RATED WSAS IN THE FREE STATE BASED ON THE PERFORMANCE OF THE 15 INDICATORS (LEFTMOST COLUMN = POOREST PERFORMER; RIGHTMOST COLUMN = BEST PERFORMER)

4.8 Key findings: Free State

Is the Free State's sanitation in good health?

The analysis below provides a snapshot of the Free State's sanitation status as of 2022/23.

Overall

The sanitation status of the province can be categorised as 'poor'.

Access to sanitation/Containment

The Free State has a very high proportion of urban settlements, with 91% of households in urban areas and 9% in rural areas. Overall, a relatively large percentage (74%) of households in the province are connected to the sewer system, while 24% rely on on-site sanitation. Additionally, 2% of the households have no access to sanitation. Consistent with the general trend across South Africa, urban areas in the Free State have better access to sewered systems, with 76% of urban households connected to the sewer network. However, in rural areas, 54% of households have sewer connections, surpassing the typical reliance on on-site sanitation, with 44% using on-site sanitation systems. This indicates relatively better access to sewer systems in the province's rural areas compared to other provinces.

Bucket and chemical toilets

Although the use of bucket toilets has declined between 2011 and 2021, as of 2023, over 30 000 households in the province continue to rely on bucket toilets. In contrast, the number of households using chemical toilets has increased since 2017, with more than 77 000 households served by chemical toilets as of 2023 (DWS, 2023b). The continued use of bucket toilets and the increasing reliance on chemical toilets contribute to the ongoing 'inappropriate sanitation' backlog across WSAs in the province. These types of sanitation solutions, while providing a temporary alternative, do not meet the standards of more permanent and hygienic sanitation infrastructure.

Sanitation backlog

Some WSAs have a sanitation backlog, with one WSA (Metsimaholo) having a 'no service' backlog exceeding 5%, which is categorised as 'poor'. Three WSAs (Maluti-a-Phofung, Metsimaholo, Setsoto) have an 'inappropriate sanitation' backlog exceeding 20%, also categorised as 'poor'.

Given the current rate of sanitation delivery (years to eradicate backlog), it is highly unlikely that four WSAs (Letsemeng, Maluti-a-Phofung, Masilonyana, Mohokare) will eradicate their backlog by 2030. Some WSAs, however, could potentially meet sector targets by 2030 (e.g. SDG 6.2).

Emptying and transport

Four WSAs (Mantsopa, Masilonyana, Nala, Phumelela) indicated that they do not empty pits. This means that users need to empty their own pits, dig their own new pits, or resort to other means. WSAs need to ensure that users are aware of appropriate safety and hygiene measures to follow. Fifteen WSAs (Dihlabeng, Kopanong, Mafube, Maluti-a-Phofung, Mangaung, Masilonyana, Matjhabeng, Metsimaholo, Mohokare, Moqhaka, Ngwathe, Nketoana, Setsoto, Tokologo, Tswelopele) indicated that they have a significant shortage of vacuum trucks and honeysuckers with their need exceeding 100% of their current fleet (i.e. they need to at least double their fleet). This result also seems to indicate that pit-emptying could currently be limited by the number of vacuum trucks and honeysuckers available.

Furthermore, the condition of most of the existing vacuum trucks and honeysuckers is far from ideal, with 12 WSAs (Kopanong, Letsemeng, Maluti-a-Phofung, Masilonyana, Matjhabeng, Mohokare, Moqhaka, Ngwathe, Nketoana, Phumelela, Setsoto, Tswelopele) indicating that they are in poor condition. This implies that breakdowns are inevitable and indicates a further vulnerability in emptying and transport.

Treatment

Six WSAs (Kopanong, Letsemeng, Maluti-a-Phofung, Mangaung, Mohokare, Tswelopele) have WWTWs where the design capacity is exceeding 90% utilisation. This implies that the capacity of the WWTWs at the remaining WSAs should be sufficient to treat incoming flows. Despite the spare treatment capacity, the performance of many WWTWs is not ideal, with 16 WSAs (Dihlabeng, Kopanong, Mafube, Maluti-a-Phofung, Mangaung, Mantsopa, Masilonyana, Matjhabeng, Metsimaholo, Moqhaka, Nala, Ngwathe, Nketoana, Phumelela, Setsoto, Tokologo) having a treated effluent quality with an overall compliance of less than 50%. All 19 WSAs indicated a significant challenge with WWTW staffing, with all WSAs (Dihlabeng, Kopanong, Letsemeng, Mafube, Maluti-a-Phofung, Mangaung, Mantsopa, Masilonyana, Matjhabeng, Metsimaholo, Mohokare, Moqhaka, Nala, Ngwathe, Nketoana, Phumelela, Setsoto, Tokologo, Tswelopele) indicating an overall WWTW staffing shortfall greater than 35%. This could contribute to the noted performance challenges.

Disposal and reuse

Nine WSAs (Letsemeng, Metsimaholo, Mohokare, Moqhaka, Nala, Ngwathe, Nketoana, Setsoto, Tokologo) scored poorly for wastewater sludge management as they do not analyse and classify their wastewater sludge and/or do not proactively manage their sludge end-use or disposal. Only one WSA (Metsimaholo) scored poorly for FSM as they do not analyse and classify their FS and/or do not proactively manage their FS end-use or disposal. Despite this, it is noted that 14 WSAs co-treat FS at their WWTWs. This could also be contributing to the poor performance noted.

Fourteen WSAs (Dihlabeng, Kopanong, Letsemeng, Mafube, Maluti-a-Phofung, Mantsopa, Masilonyana, Matjhabeng, Metsimaholo, Moqhaka, Nala, Phumelela, Tokologo, Tswelopele) do not reuse treated wastewater effluent for any purpose. This lack of reuse could be because of the poor quality of treated effluent.

Institutional aspects

All 19 WSAs did not perform well in the 2021 Green Drop certification audit, with all WSAs (Dihlabeng, Kopanong, Letsemeng, Mafube, Maluti-a-Phofung, Mangaung, Mantsopa, Masilonyana, Matjhabeng, Metsimaholo, Mohokare, Moqhaka, Nala, Ngwathe, Nketoana, Phumelela, Setsoto, Tokologo, Tswelopele) having a very poor Green Drop performance score of less than 50%.

Eleven WSAs (Dihlabeng, Mafube, Maluti-a-Phofung, Mangaung, Matjhabeng, Moqhaka, Ngwathe, Nketoana, Setsoto, Tokologo, Tswelopele) have significant sanitation staff challenges with sanitation staff vacancies of more than 35%. Fifteen WSAs (Dihlabeng, Kopanong, Mafube, Maluti-a-Phofung, Mantsopa, Masilonyana, Matjhabeng, Metsimaholo, Mohokare, Moqhaka, Nala, Phumelela, Setsoto, Tokologo, Tswelopele) indicated that the financial status of their sanitation business is far from ideal and is running at a deficit.

Photo: Bob Brewer on Unsplash

5 Situational analysis: Gauteng

Section 5 provides a summary of data and findings from the **Gauteng Situational Analysis** report.

For access to the full report, scan the QR code above.

What is the current reality in the province?

5.1 Gauteng overview

Water services authorities

WSAs are responsible for supplying both water and sanitation services to households in their area of jurisdiction. In Gauteng, there are:

- 3 metropolitan municipalities
- 2 district municipalities
- 6 local municipalities
- 9 WSAs

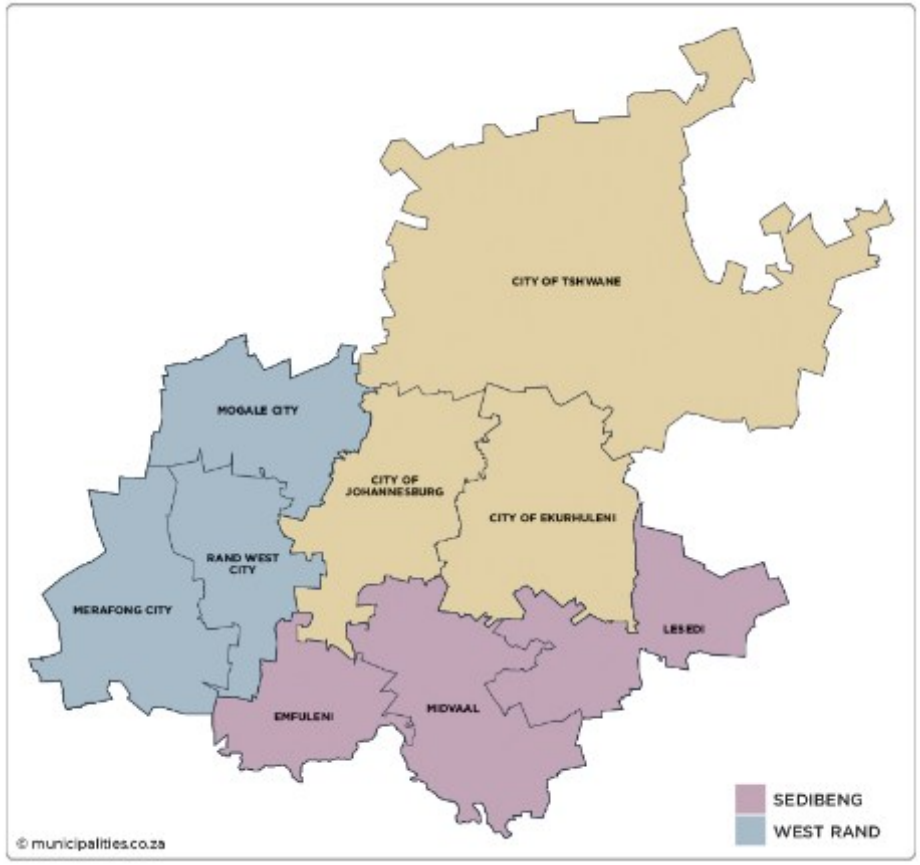


FIGURE 5-1: MUNICIPALITIES AND WSAS IN GAUTENG

Metropolitan municipalities
City of Ekurhuleni *
City of Johannesburg*
City of Tshwane*

District municipalities
Sedibeng
West Rand

Local municipalities
Emfuleni*
Lesedi*
Midvaal*
Merafong City*
Mogale City*
Rand West City*

(* indicates WSA)

5.2 Access to sanitation: Households

Sanitation service levels per household: A provincial view

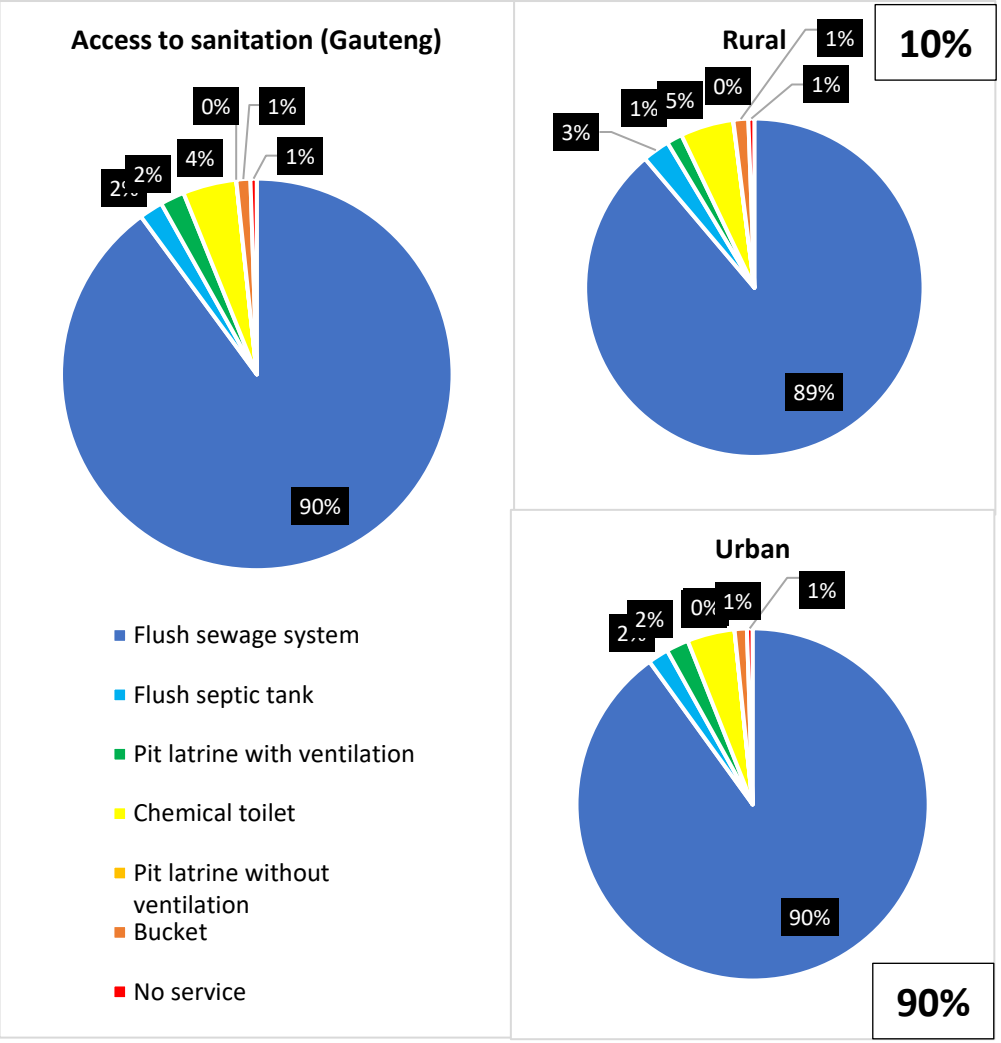


FIGURE 5-2: SANITATION SERVICE LEVELS PER HOUSEHOLD IN GAUTENG

An analysis of sanitation provision by settlement type (see Figure 5-2 and Table 5-1) depicts a total number of 6 241 813 households in Gauteng, of which 603 275 (10%) are rural settlements and 5 638 538 (90%) urban settlements (DWS, 2022b).

The data shows that provincially:

- **90%** of households have access to a flush toilet connected to the sewage system.
- **1%** of households do not have access to sanitation (implying open defecation).
- The remaining **9%** of households utilise some form of on-site sanitation system, including septic tanks (2%), pit latrines with ventilation (i.e. VIPs) (2%), chemical toilets (4%), pit latrines without ventilation (0%) and bucket latrines (1%).

In rural settlements:

- **89%** of households have access to a flush toilet connected to the sewage system.
- **1%** of households do not have access to sanitation (implying open defecation).
- The remaining **10%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (1%), chemical toilets (5%), pit latrines without ventilation (0%) and bucket latrines (1%).

In urban settlements:

- **90%** of households have access to a flush toilet connected to the sewage system.
- **1%** of households do not have access to sanitation (implying open defecation).
- The remaining **9%** of households utilise some form of on-site sanitation system, including septic tanks (2%), pit latrines with ventilation (i.e. VIPs) (2%), chemical toilets (4%), pit latrines without ventilation (0%) and bucket latrines (1%).

The analysis of sanitation provision by settlement type at the WSA level in Gauteng is depicted in Figure 5-3 and detailed in Table 5-1.

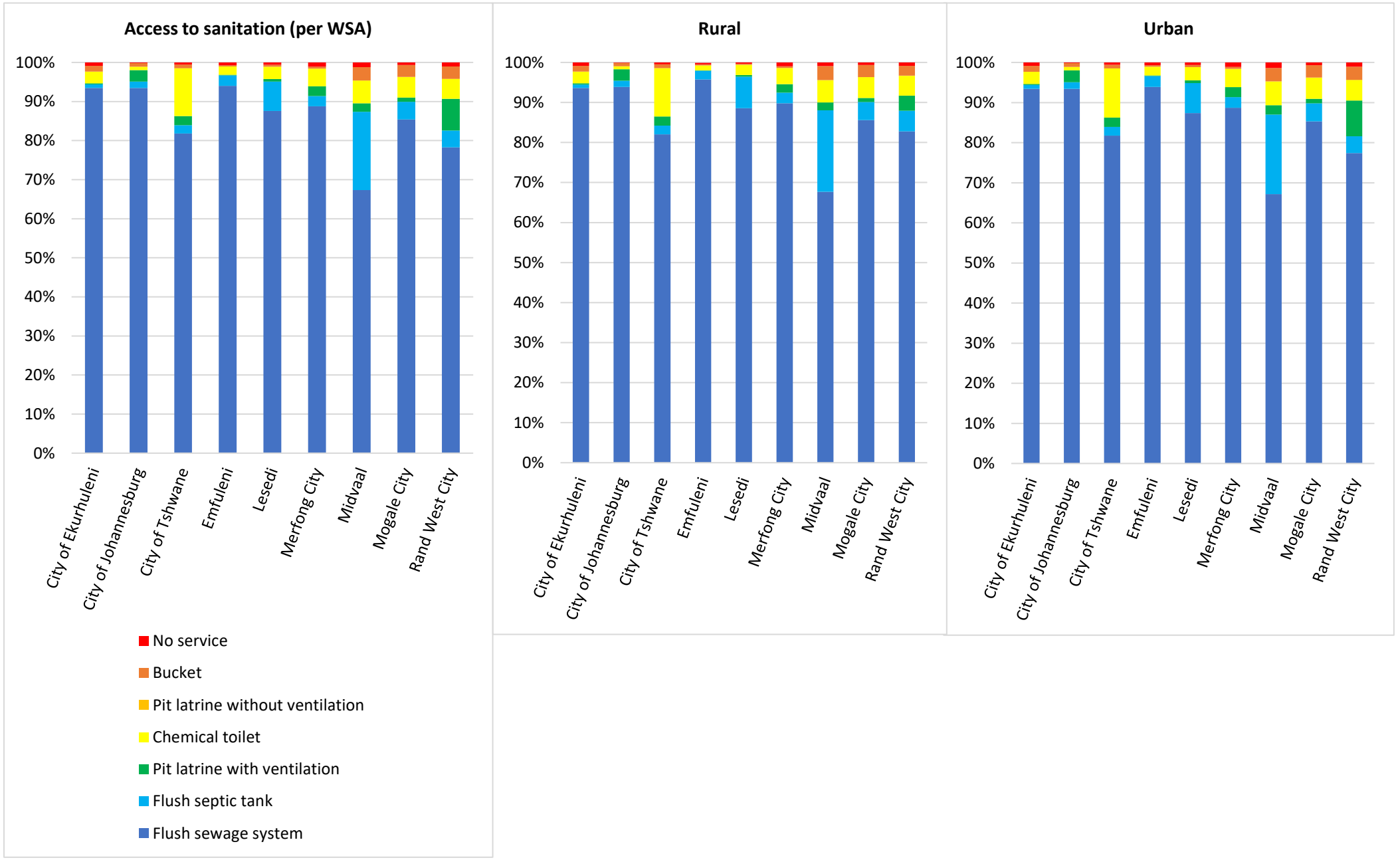


FIGURE 5-3: SANITATION SERVICE LEVELS PER HOUSEHOLD IN NINE WSAS IN GAUTENG

TABLE 5-1: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN GAUTENG

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
City of Ekurhuleni	1 639 684		1 532 201	93	15 250	1	4 804	0	49 299	3	0	0	23 956	1	14 118	1
Rural	207 096	13	193 873	94	1 798	1	619	0	6 093	3	0	0	2 986	1	1 720	1
Urban	1 432 588	87	1 338 328	93	13 452	1	4 185	0	43 206	3	0	0	20 970	1	12 398	1
City of Johannesburg	2 339 021		2 185 722	93	38 074	2	69 522	3	20 033	1	0	0	21 880	1	3 763	0
Rural	105 783	5	99 333	94	1 612	2	3 060	3	784	1	0	0	903	1	90	0
Urban	2 233 238	95	2 086 389	93	36 462	2	66 462	3	19 249	1	0	0	20 977	1	3 673	0
City of Tshwane	1 434 785		1 173 704	82	30 655	2	33 858	2	175 245	12	424	0	12 926	1	7 964	1
Rural	145 152	10	119 072	82	3 151	2	3 307	2	17 445	12	136	0	1 364	1	676	0
Urban	1 289 633	90	1 054 632	82	27 504	2	30 551	2	157 800	12	288	0	11 562	1	7 288	1
Emfuleni	318 670		299 643	94	8 503	3	441	0	6 740	2	0	0	1 149	0	2 174	1
Rural	23 858	7	22 844	96	519	2	21	0	302	1	0	0	59	0	90	0
Urban	294 812	93	276 799	94	7 984	3	420	0	6 438	2	0	0	1 090	0	2 084	1
Lesedi	49 579		43 416	88	3 732	8	330	1	1 575	3	0	0	236	0	288	1
Rural	8 201	17	7 265	89	643	8	35	0	208	3	0	0	22	0	29	0
Urban	41 378	83	36 151	87	3 089	7	295	1	1 367	3	0	0	214	1	259	1
Merfong City	95 637		84 892	89	2 537	3	2 384	2	4 305	5	0	0	483	1	1 021	1
Rural	7 107	7	6 380	90	189	3	154	2	284	4	0	0	31	0	69	1
Urban	88 530	93	78 512	89	2 348	3	2 230	3	4 021	5	0	0	452	1	952	1
Midvaal	48 001		32 330	67	9 616	20	1 047	2	2 799	6	0	0	1 632	3	577	1
Rural	17 900	37	12 111	68	3 647	20	349	2	999	6	0	0	629	4	163	1
Urban	30 101	63	20 219	67	5 969	20	698	2	1 800	6	0	0	1 003	3	414	1
Mogale City	185 694		158 578	85	8 403	5	2 009	1	9 800	5	0	0	5 671	3	1 228	1
Rural	67 896	37	58 100	86	3 096	5	691	1	3 519	5	0	0	2 067	3	424	1
Urban	117 798	63	100 478	85	5 307	5	1 318	1	6 281	5	0	0	3 604	3	804	1
Rand West City	130 742		102 308	78	5 624	4	10 647	8	6 666	5	47	0	4 091	3	1 364	1
Rural	20 282	16	16 791	83	1 040	5	767	4	1 006	5	8	0	500	2	171	1
Urban	110 460	84	85 517	77	4 584	4	9 880	9	5 660	5	39	0	3 591	3	1 193	1
Gauteng	**6 241 813**		**5 612 794**	**90**	**122 394**	**2**	**125 042**	**2**	**276 462**	**4**	**471**	**0**	**72 024**	**1**	**32 497**	**1**
Rural	**603 275**	**10**	**535 769**	**89**	**15 695**	**3**	**9 003**	**1**	**30 640**	**5**	**144**	**0**	**8 561**	**1**	**3 432**	**1**
Urban	**5 638 538**	**90**	**5 077 025**	**90**	**106 699**	**2**	**116 039**	**2**	**245 822**	**4**	**327**	**0**	**63 463**	**1**	**29 065**	**1**

5.3 Bucket and chemical toilets in Gauteng

Are bucket toilets still in use?

Bucket toilets should have already been eradicated in South Africa. Yet, as of 2023, there are still more than 72 000 households in Gauteng using bucket toilets (DWS, 2023b), as illustrated in Figure 5-4.

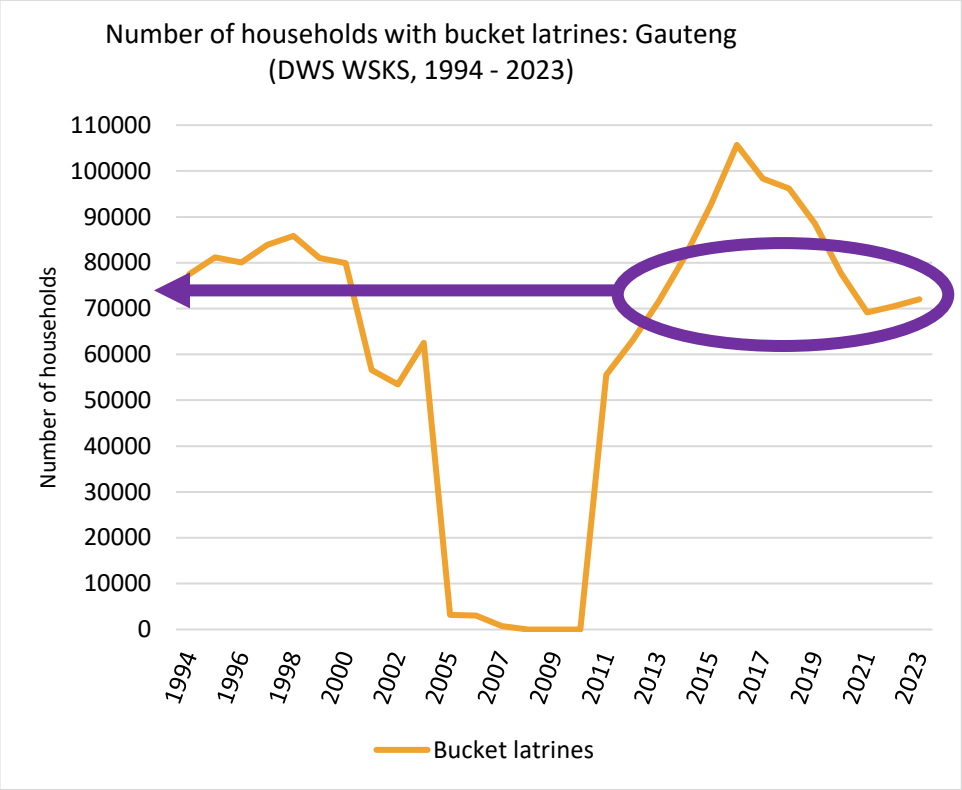


FIGURE 5-4: NUMBER OF HOUSEHOLDS WITH BUCKET LATRINES IN GAUTENG FROM 1994 TO 2023

Are chemical toilets an issue?

Currently, more than 276 000 households in Gauteng are served by chemical toilets (DWS, 2023b), as illustrated in Figure 5-4. Can the province afford this?

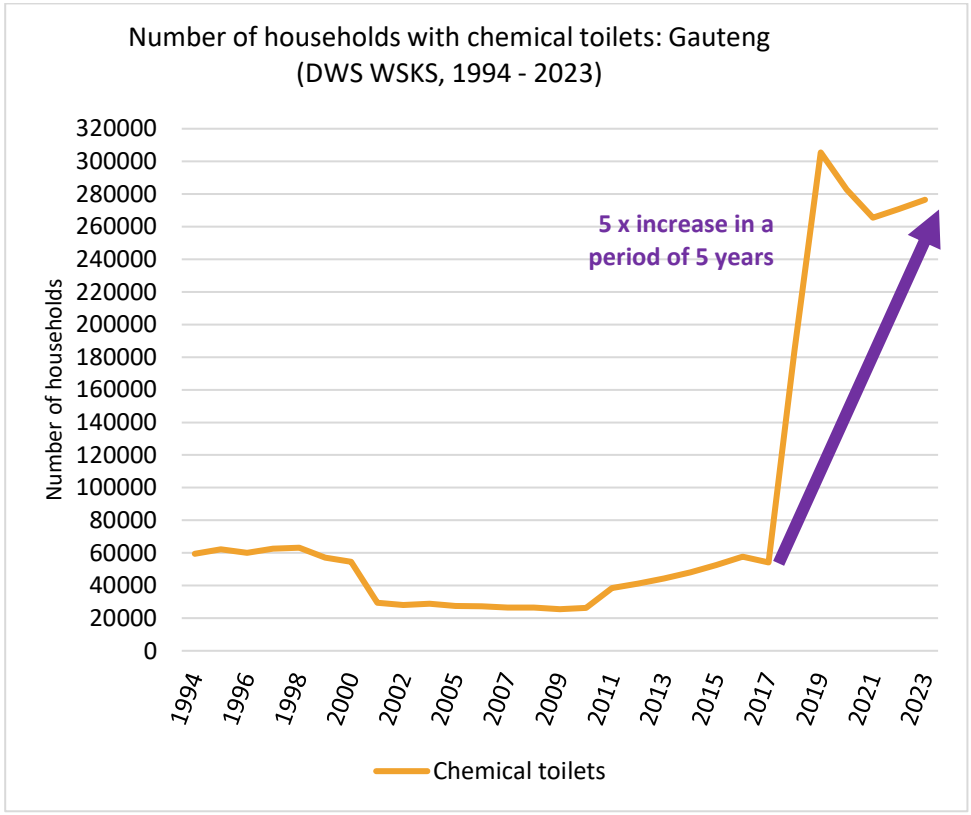


FIGURE 5-5: NUMBER OF HOUSEHOLDS WITH CHEMICAL TOILETS IN GAUTENG FROM 1994 TO 2023

Assuming 2.5 households are served per chemical toilet (i.e. ~10 people per toilet, ~110 400 chemical toilets in operation), and chemical toilet rental costs of R750/month, this equates to a cost of **~R83 million/month** or **~R994 million/year**.

Could innovative sanitation alternatives meet the same needs (or perform even better) at a lower cost?

5.4 Progress on eradicating sanitation backlog

Is Gauteng on target to eradicate sanitation backlogs?

Gauteng is tracking relatively well in terms of overall backlogs, with the City of Tshwane showing the highest backlog at 14%. In contrast, other WSAs exhibit backlogs ranging from 9% to as low as 2% in the City of Johannesburg. Figure 5-6 shows the percentage of appropriate, inappropriate and unacceptable sanitation for each WSA in Gauteng, as well as the overall statistics for the province.

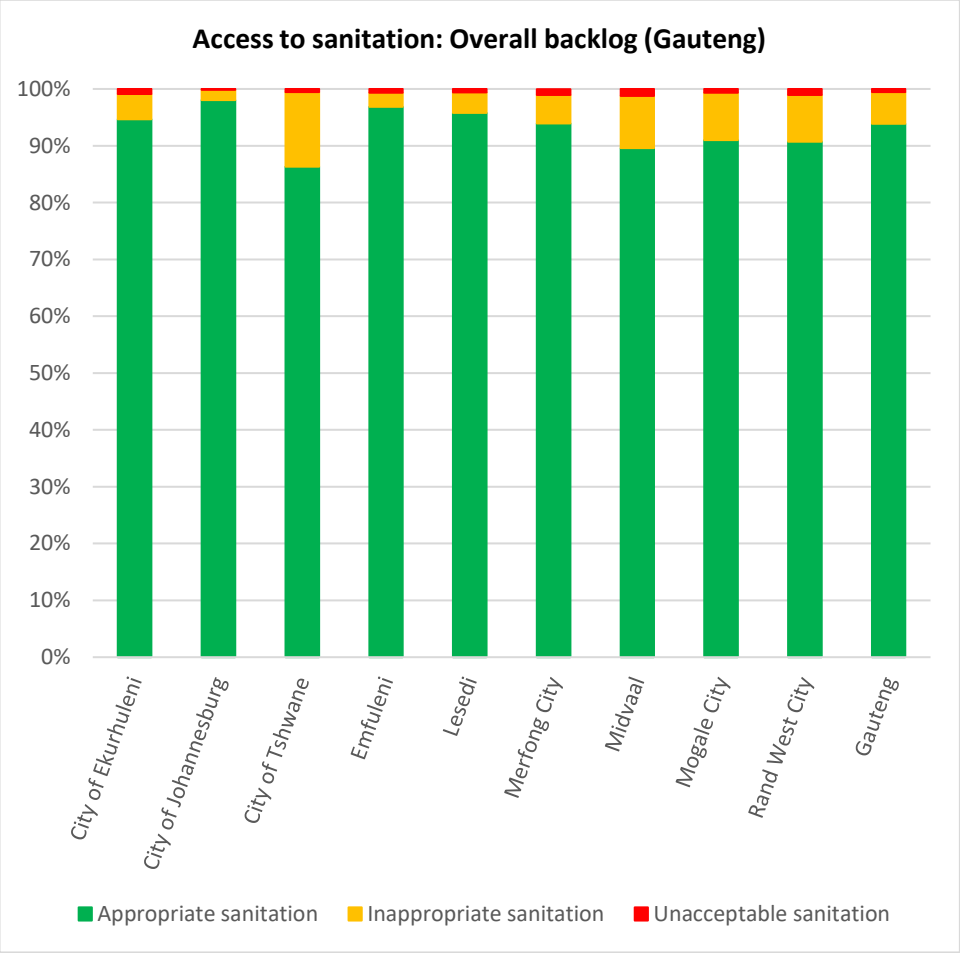


FIGURE 5-6: ACCESS TO SANITATION AND OVERALL BACKLOG IN GAUTENG

TABLE 5-2: RATE OF SANITATION DELIVERY AND LIKELIHOOD OF WSAS IN GAUTENG TO ACHIEVE BACKLOG ERADICATION

Rate of delivery (years to eradicate backlog) (as of 2021)	End date	Years to achieve
City of Ekurhuleni	2071	50
City of Johannesburg	2040	19
City of Tshwane	2096	75
Emfuleni	2057	36
Lesedi	2020	-2 (i.e. achieved)
Merafong	2023	2
Midvaal	2024	3
Mogale City	2065	44
Rand West City	2026	5

NOTE: The figures above were calculated in 2021. Has there been progress since then? Has the rate of sanitation service delivery (i) increased, (ii) stayed the same, or (iii) decreased? Understanding (a) sanitation backlog and (b) the rate of sanitation service delivery will help to determine if WSAs are on track to meet sanitation access-related SDGs.

From Table 5-2 above:

- 1 WSA has already eradicated its backlog (blue).
- 3 WSAs have a good chance of eradicating their backlog by 2030 (green).
- 5 WSAs are not addressing their backlogs quickly enough and are unlikely to achieve backlog eradication.

5.5 Municipal sanitation status: Gauteng

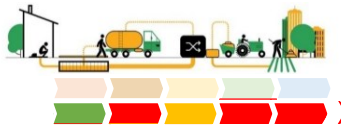
Where is Gauteng doing well?

Access to sanitation has been improving since 1994 and the status of containment for the Gauteng province is categorised as 'good'. Despite this progress, emptying and transport have been categorised as 'poor' and treatment as 'average'. The status of disposal and reuse has also been categorised as 'poor' for Gauteng. The analysis has shown that the health of the sanitation service chain is far from ideal. It is not surprising that institutional aspects are also categorised as 'poor'. There appears to be little innovation or value add related to the sanitation sector in the province. Challenges are compounded by growing informal settlements. Unfortunately, there is much work to do to improve sanitation in the province.

water & sanitation
Department: Water and Sanitation
REPUBLIC OF SOUTH AFRICA

National Sanitation Integrated Plan

Provincial Status Report
Gauteng



Provincial Status
Poor

National Status

Total Provinces
9

			Data Set (*indicates number of WSAs with data submitted*)
Context			
Population (DWS WSKS) (April 2023)	16109585		9 / 9
Number of households (DWS WSKS) (April 2023)	6241813	HH	9 / 9
Number of wastewater treatment works	60		9 / 9
Number of sewer pump stations	263		9 / 9
Length of sewer pipelines	20048	km	5 / 9
Containment		**Good**	
1.1 No sanitation (backlog) (DWS WSKS) (April 2023)	1	% HH	Good 9 / 9
1.2 Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)	6	% HH	Good 9 / 9
1.3 Average rate of sanitation delivery (years to eradicate backlog)	26	years	Poor 9 / 9
Emptying and Transport		**Poor**	
2.1 Sewer network condition	NI		0 / 9
2.2 Pit toilet emptying	44	% of WSAs	Poor 8 / 9
2.3 Vacuum truck / honeysucker needs	21	trucks	Poor 7 / 9
2.4 Vacuum truck / honeysucker condition	33	% in fair condition	Poor 6 / 9
Treatment		**Average**	
3.1 % of wastewater treatment works design capacity utilised	97	%	Average 9 / 9
3.1.1 Design capacity	2679.6	Ml/d	9 / 9
3.1.2 Available capacity	2572.0	Ml/d	9 / 9
3.1.3 Operational capacity	2460.2	Ml/d	9 / 9
3.2 Wastewater treatment works effluent quality	46	% compliance	Poor 9 / 9
3.2.1 Microbiological compliance	34	%	9 / 9
3.2.2 Chemical compliance	48	%	9 / 9
3.2.3 Physical compliance	56	%	9 / 9
3.3 Wastewater treatment works staffing shortfall	21	%	Poor 9 / 9
3.3.1 Number of supervisor(s): Compliant	48		9 / 9
3.3.2 Number of supervisor(s): Shortfall	16		9 / 9
3.3.3 Number of PC(s): Compliant	181		9 / 9
3.3.4 Number of PC(s): Shortfall	45		9 / 9
Disposal and Reuse		**Poor**	
4.1 Analysis and classification of wastewater sludge	56	% of WSAs	Poor 9 / 9
4.2 Wastewater sludge management	22	% acceptable practices	9 / 9
4.3 Analysis and classification of faecal sludge	11	% of WSAs	Poor 9 / 9
4.4 Faecal sludge management	89	% acceptable practices	9 / 9
4.5 Treated wastewater effluent reuse	33	% of WSAs	Poor 9 / 9
Institutional Aspects		**Poor**	
5.1 Green Drop performance (2021)	68	%	Poor 9 / 9
5.2 Sanitation staff vacancies	30	%	Poor 8 / 9
5.3 Sanitation business financial status	44	% of WSAs operate a surplus	Poor 6 / 9
5.4 Growing informal settlements	11	% of WSAs	1 / 9
5.5 Shit-flow diagrams developed for sanitation systems	11	% of WSAs	9 / 9
5.6 Alternative/innovative sanitation processes or technologies implemented	33	% of WSAs have implement multiple	9 / 9
5.6.1 Toilets	*33*	% of WSAs	8 / 9
5.6.2 Emptying	*11*	% of WSAs	7 / 9
5.6.3 Transport	*11*	% of WSAs	8 / 9
5.6.4 Treatment	*33*	% of WSAs	8 / 9
5.6.5 Disposal benefication	*22*	% of WSAs	9 / 9
5.6.6 New business models	*11*	% of WSAs	8 / 9

FIGURE 5-7: SANITATION STATUS IN GAUTENG

5.6 1st order excreta flow diagram (SFD): Gauteng

What are some of the contributors to poor sanitation performance?

The 1st order SFD for Gauteng (Figure 5-8) highlights significant gaps in the sanitation service chain. These deficiencies all potentially have a negative impact on communities (e.g. water supply) and the environment (e.g. water sources).

Emptying and transport:

- Lost sewage due to old and leaking pipes
- Inadequate maintenance of basic sanitation systems (e.g. not emptied)

Treatment:

- Poorly operated, maintained and managed WWTW resulting in poor performance or non-compliance

End-use or disposal:

- Inadequate sludge analysis and classification
- Inappropriate sludge disposal and/or non-beneficial use

Institutional:

- Inadequate sanitation systems or programme funding

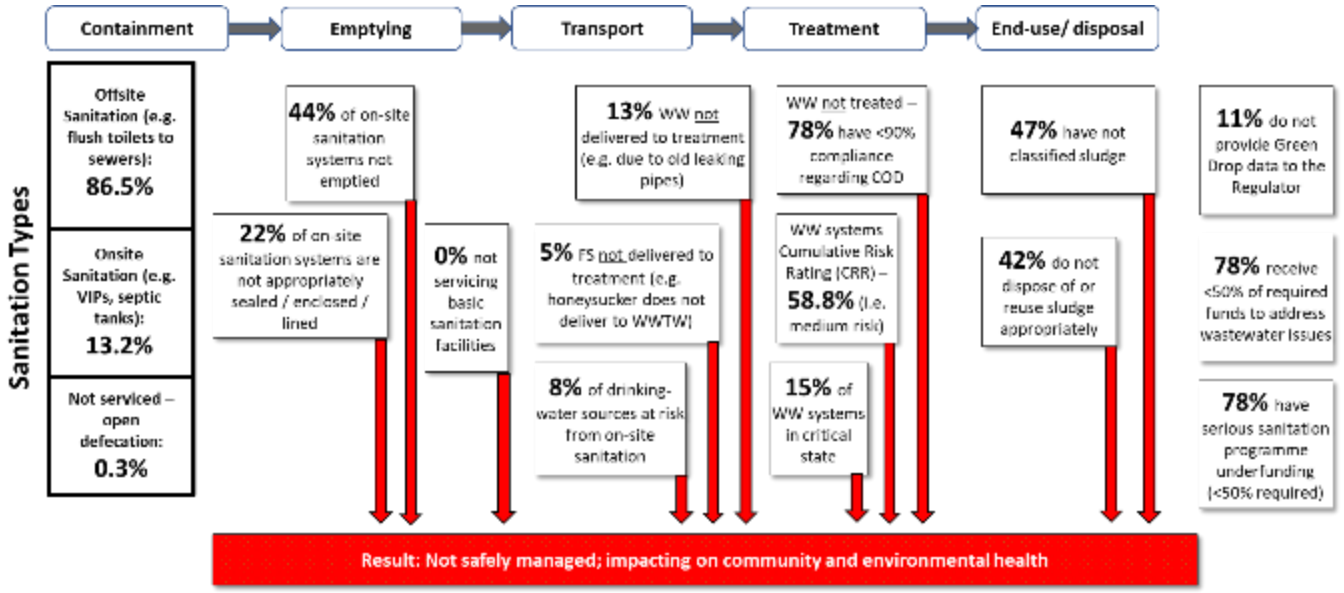


FIGURE 5-8: 1ST ORDER SFD: GAUTENG

5.7 Sanitation status along the service chain

An analysis of the sanitation service chain shows there is much work to do

A total of 15 indicators were selected and analysed to assess the status of the sanitation service chain, focusing on the quality of available data. This includes three indicators for each of the four service chain components, plus three additional indicators addressing institutional aspects. The analysis results for Gauteng, obtained from the situational analysis tool developed as part of the NSIP Project, are presented visually in Figure 5-9 to Figure 5-11. The colour coding used in the analysis indicates effectiveness levels based on predefined scoring criteria. Green signifies that systems are functioning well and meeting expectations, while amber indicates average performance with identified areas for improvement. In contrast, red highlights poor performance or significant issues that require immediate attention (refer to Appendix B of the Monitoring Framework and Guide for detailed scoring rules). The visual representation in Figure 5-9 provides a comprehensive overview of the sanitation status along the service chain for all provinces in the country, allowing for quick and easy assessment at a glance.

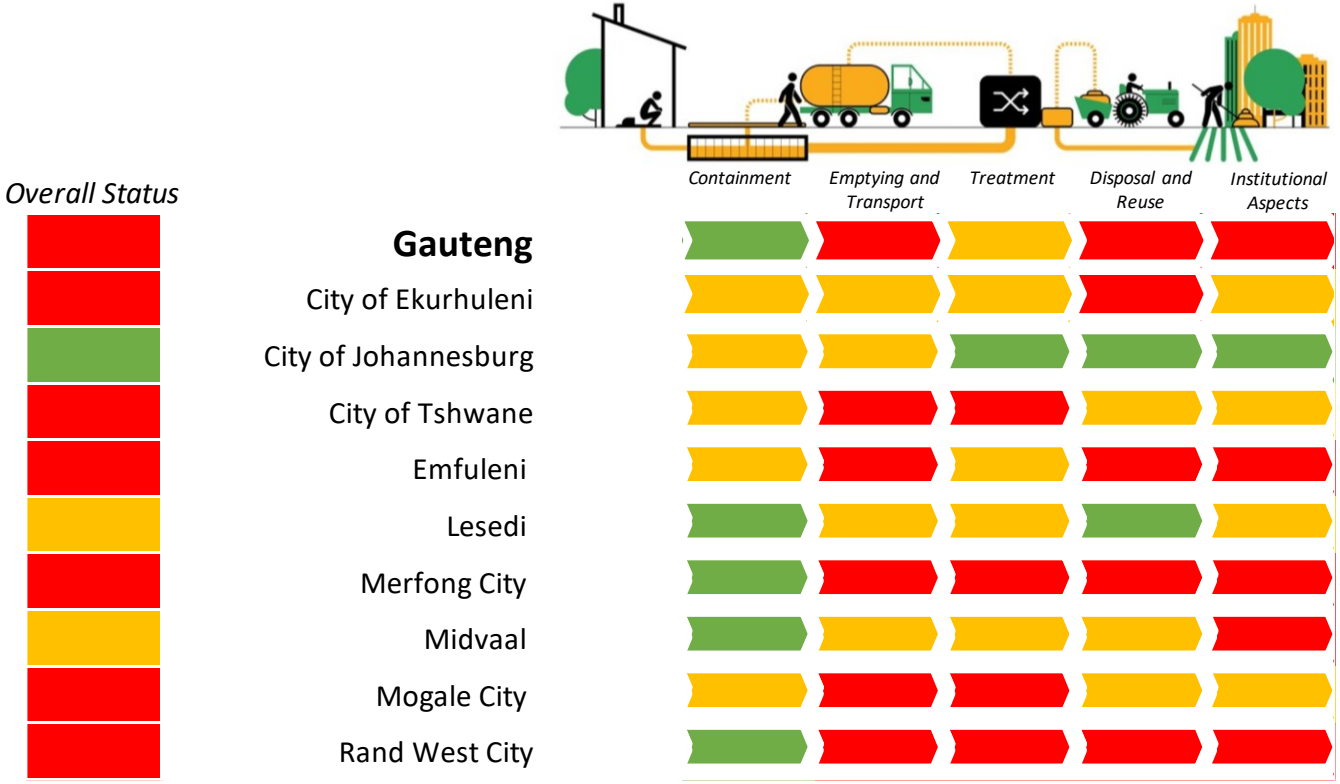


FIGURE 5-9: OVERVIEW OF SANITATION STATUS ALONG THE SERVICE CHAIN FOR WSAS IN GAUTENG

Overall score	
>75%	Good
50%-75%	Average
<50%	Poor

- The performance of Gauteng and most WSAs falls short of the desired standard, with two WSAs (Lesedi and Midvaal) achieving an 'average' overall status. However, one WSA (City of Johannesburg) stands out and is categorised as 'good'.
- Containment in Gauteng, although not ideal, appears to be under control with no WSAs performing poorly in the regard.
- Encouragingly, one WSA (City of Johannesburg) demonstrates good performance in treatment, disposal, and reuse, as well as institutional aspects.
- Another WSA (Lesedi) performs well specifically in disposal and reuse practices.
- The health of the sanitation service chain is notably deficient, with institutional aspects categorised as 'poor' for the majority of WSAs. Only one WSA (City of Johannesburg) performs well, and four WSAs (City of Ekurhuleni, City of Tshwane, Lesedi and Mogale City) manage to attain an 'average' status in this regard.

5.7.1 Heat map: Gauteng

The heat map further highlights key deficiencies in the sanitation service chain

The results of the analysis of the 15 indicators are represented for all the WSAs in Gauteng in the heat map in Figure 5-10. Green signifies that systems are functioning well and meeting the expectations defined by the scoring criteria. Amber indicates average performance, suggesting areas that require improvement, while red highlights poor performance or significant issues that require immediate attention. Although there are pockets of good performance, overall, the performance is far from ideal.

	Gauteng	City of Ekurhuleni	City of Johannesburg	City of Tshwane	Emfuleni	Lesedi	Merfong City	Midvaal	Mogale City	Rand West City
Indicator #	**Overall sanitation status**									
	Containment									
1	No sanitation (backlog) (DWS WSKS) (April 2023)									
2	Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)									
3	Rate of sanitation delivery (backlog eradication)									
	Emptying and Transport									
4	Pit toilet emptying									
5	Vacuum truck / honeysucker needs									
6	Vacuum truck / honeysucker condition									
	Treatment									
7	WWTW design capacity utilised									
8	WWTW effluent quality									
9	WWTW staffing shortfall									
	Disposal and Reuse									
10	Analysis and classification of wastewater sludge Wastewater sludge management									
11	Analysis and classification of faecal sludge Faecal sludge management									
12	Treated wastewater effluent reuse									
	Institutional Aspects									
13	Green Drop performance									
14	Sanitation staff vacancies									
15	Sanitation business financial status									

Green – Good | Amber – Average | Red – Poor

FIGURE 5-10: HEAT MAP SHOWING THE STATUS OF THE 15 INDICATORS FOR WSAS IN GAUTENG

5.7.2 Rating WSAs in Gauteng: Sanitation service chain elements

The performance of each of the 15 indicators of the sanitation service chain highlights key deficiencies at WSAs

Using the heat map and total scores of the 15 indicators, each WSA in Gauteng is ranked from poorest-performing on the left to best-performing on the right, as shown in Figure 5-11. WSAs facing significant challenges across the sanitation service chain, including related institutional factors, are marked mostly in red, starting on the far left, while those that are performing well are indicated mostly in green, moving towards the far right.

The 15 sanitation service chain elements that are rated are indicated below:

	Containment
1.	No sanitation (backlog)
2.	Inappropriate sanitation (backlog)
3.	Rate of sanitation delivery (years to eradicate backlog)
	Emptying and transport
4.	Pit toilet emptying
5.	Vacuum truck/honeysucker needs
6.	Vacuum truck/honeysucker condition
	Treatment
7.	WWTW design capacity utilised
8.	WWTW effluent quality
9.	WWTW staffing shortfall
	Disposal and reuse
10.	Analysis and classification of wastewater sludge
	Wastewater sludge management
11.	Analysis and classification of FS
	FSM
12.	Treated wastewater effluent reuse
	Institutional aspects
13.	Green Drop performance (2021)
14.	Sanitation staff vacancies
15.	Sanitation business financial status

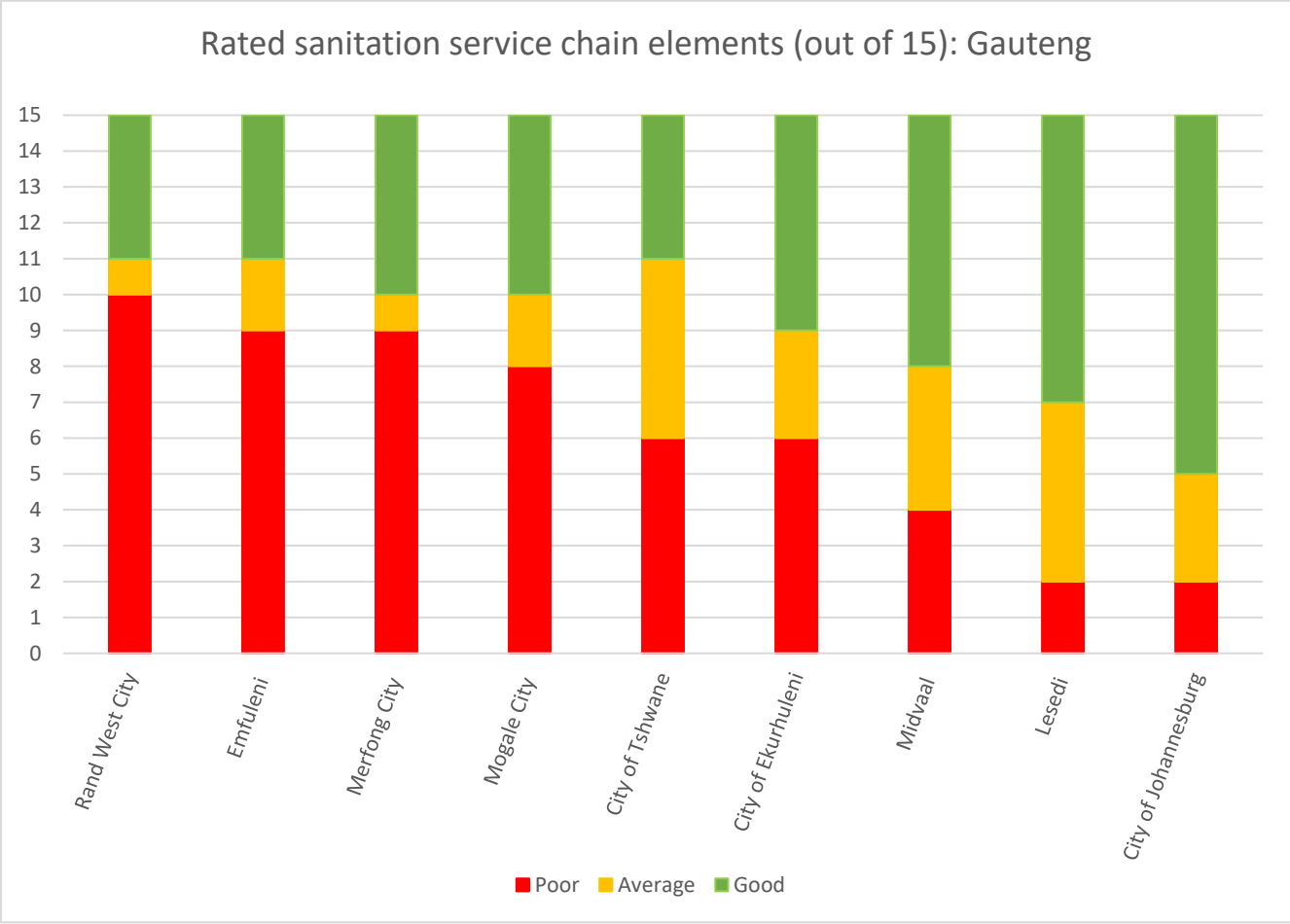


FIGURE 5-11: RATED WSAS IN GAUTENG BASED ON THE PERFORMANCE OF THE 15 INDICATORS (LEFTMOST COLUMN = POOREST PERFORMER; RIGHTMOST COLUMN = BEST PERFORMER)

5.8 Key findings: Gauteng

Is Gauteng's sanitation in good health?

The analysis below provides a snapshot of Gauteng's sanitation status as of 2022/23.

Overall

The sanitation status of the province can be categorised as 'poor'.

Access to sanitation/Containment

Gauteng has a very high proportion of urban settlements, with 90% of households in urban areas and 10% in rural areas. Overall, a large percentage (90%) of households in the province are connected to the sewer system, while 9% rely on on-site sanitation. Additionally, 1% of the households have no access to sanitation. In Gauteng, both urban and rural areas have high proportions of households with access to sewered systems. In urban areas, 90% of households are connected to the sewer network, while 9% of households use on-site sanitation solutions. Similarly, in rural areas, 89% of households have sewer connections, while 10% rely on on-site sanitation solutions. This indicates good access to sewer systems in the province's rural areas compared to other provinces.

Bucket and chemical toilets

Although the use of bucket toilets declined between 2011 and 2021, there has been a slight rise in numbers observed from 2021 to 2023. As of 2023, over 72 000 households in the province continue to rely on bucket toilets, making it the province with the highest number of households using bucket latrines. The number of households using chemical toilets has slightly increased since 2021, with more than 276 000 households served by chemical toilets as of 2023 (DWS, 2023b). The continued use of bucket toilets and the increasing reliance on chemical toilets contribute to the ongoing 'inappropriate sanitation' backlog across WSAs in the province. These types of sanitation solutions, while providing a temporary alternative, do not meet the standards of more permanent and hygienic sanitation infrastructure.

Sanitation backlog

Given the current rate of sanitation delivery (years to eradicate backlog), it is highly unlikely that five WSAs (City of Ekurhuleni, City of Johannesburg, City of Tshwane, Emfuleni, Mogale City) will eradicate their backlog by 2030. Some Gauteng WSAs could, however, potentially meet sector targets by 2030 (e.g. SDG 6.2). One WSA (Lesedi) has already eradicated their sanitation backlog.

Emptying and transport

Five WSAs (City of Ekurhuleni, City of Tshwane, Emfuleni, Mogale City, Rand West City) indicated that they do not empty pits. This means that users need to empty their own pits, dig their own new pits, or resort to other means. WSAs need to ensure that users are aware of appropriate safety and hygiene measures to follow.

Six WSAs (Emfuleni, Lesedi, Merafong City, Midvaal, Mogale City, Rand West City) indicated that they have a significant shortage of vacuum trucks and honeysuckers with their need exceeding 100% of their current fleet (i.e. they need to at least double their fleet). This result also seems to indicate that pit-emptying could currently be limited by the number of vacuum trucks and honeysuckers available.

Furthermore, the condition of most of the existing vacuum trucks and honeysuckers is far from ideal, with five WSAs (City of Johannesburg, City of Tshwane, Merafong City, Mogale City, Rand West City) indicating that they are in poor condition. This implies that breakdowns are inevitable and indicates a further vulnerability in emptying and transport.

Treatment

Only one WSA (City of Ekurhuleni) has WWTWs where the design capacity exceeds 90% utilisation. This implies that the capacity of the WWTWs at the remaining WSAs should be sufficient to treat incoming flows.

Despite the spare treatment capacity, the performance of WWTWs of five WSAs (City of Tshwane, Emfuleni, Merafong City, Mogale City, Rand West City) is not ideal, with a treated effluent quality with an overall compliance of less than 50%.

More than half of the WSAs indicated a significant challenge with WWTW staffing, with five WSAs (City of Tshwane, Merafong City, Midvaal, Mogale City, Rand West City) indicating an overall WWTW staffing shortfall of more than 35%. This could contribute to the noted performance challenges.

Disposal and reuse

Four WSAs (City of Ekurhuleni, Emfuleni, Merafong City, Rand West City) scored poorly for wastewater sludge management as they do not analyse and classify their

wastewater sludge and/or do not proactively manage their sludge end-use or disposal.

Only one WSA (Emfuleni) scored poorly for FSM as they do not analyse and classify their FS and/or do not proactively manage their FS end-use or disposal. Despite this, it is noted that seven WSAs co-treat FS at their WWTWs. This could also be contributing to the poor performance noted.

Six WSAs (City of Ekurhuleni, Emfuleni, Merafong City, Midvaal, Mogale City, Rand West City) do not reuse treated wastewater effluent for any purpose. This lack of reuse could be because of the poor quality of treated effluent.

Institutional aspects

Most WSAs did not perform well in the most recent Green Drop assessment, with three WSAs (Emfuleni, Merfong City, Rand West City) having a very poor Green Drop performance score of less than 50%.

Five WSAs (City of Tshwane, Lesedi, Merafong City, Mogale City, Rand West City) have significant sanitation staff challenges with sanitation staff vacancies of more than 35%.

Five WSAs (City of Ekurhuleni, Emfuleni, Merafong City, Midvaal, Rand West City) indicated that the financial status of their sanitation business is far from ideal and is running at a deficit.

6 Situational analysis: KwaZulu-Natal

Section 6 provides a summary of data and findings from the **KwaZulu-Natal Situational Analysis** report.

For access to the full report, scan the QR code above.

What is the current reality in the province?

6.1 KwaZulu-Natal overview

Water services authorities

WSAs are responsible for supplying both water and sanitation services to households in their area of jurisdiction. In KwaZulu-Natal, there are:

- 1 metropolitan municipality
- 10 district municipalities
- 43 local municipalities
- 14 WSAs

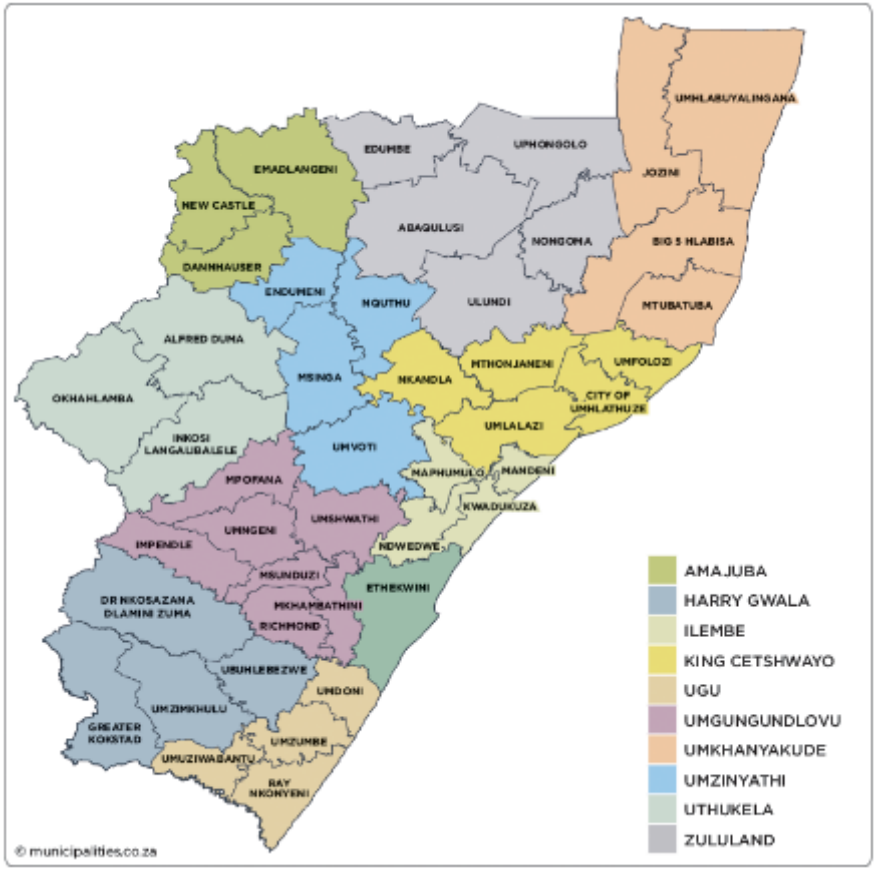


FIGURE 6-1: MUNICIPALITIES AND WSAS IN KWAZULU-NATAL

Metropolitan municipalities
eThekwini*

District municipalities		
Amajuba*	Ugu*	uThukela*
Harry Gwala*	uMgungundlovu*	Zululand*
iLembe*	uMkhanyakude*	
King Cetshwayo*	uMzinyathi*	

Local municipalities			
Dannhauser	City of uMhlathuze*	Mpofana	uMsinga
eMadlangeni	Mthonjaneni	Msunduzi*	Umvoti
Newcastle*	Nkandla	Richmond	Alfred Duma
Dr Nkosazana Dlamini Zuma	uMfolozi	uMngeni	Inkosi Langalibalele
Greater Kokstad	uMlalazi	uMshwathi	Okhahlamba
Ubuhlebezwe	Ray Nkonyeni	Big 5 Hlabisa	AbaQulusi
Umzimkhulu	Umdoni	Jozini	eDumbe
KwaDukuza	Umuziwabantu	Mtubatuba	Nongoma
Mandeni	Umzumbe	uMhlabuyalingana	Ulundi
Maphumulo	Impendle	Endumeni	uPhongolo
Ndwedwe	Mkhambathini	Nquthu	

(* indicates WSA)

6.2 Access to sanitation: Households

Sanitation service levels per household: A provincial view

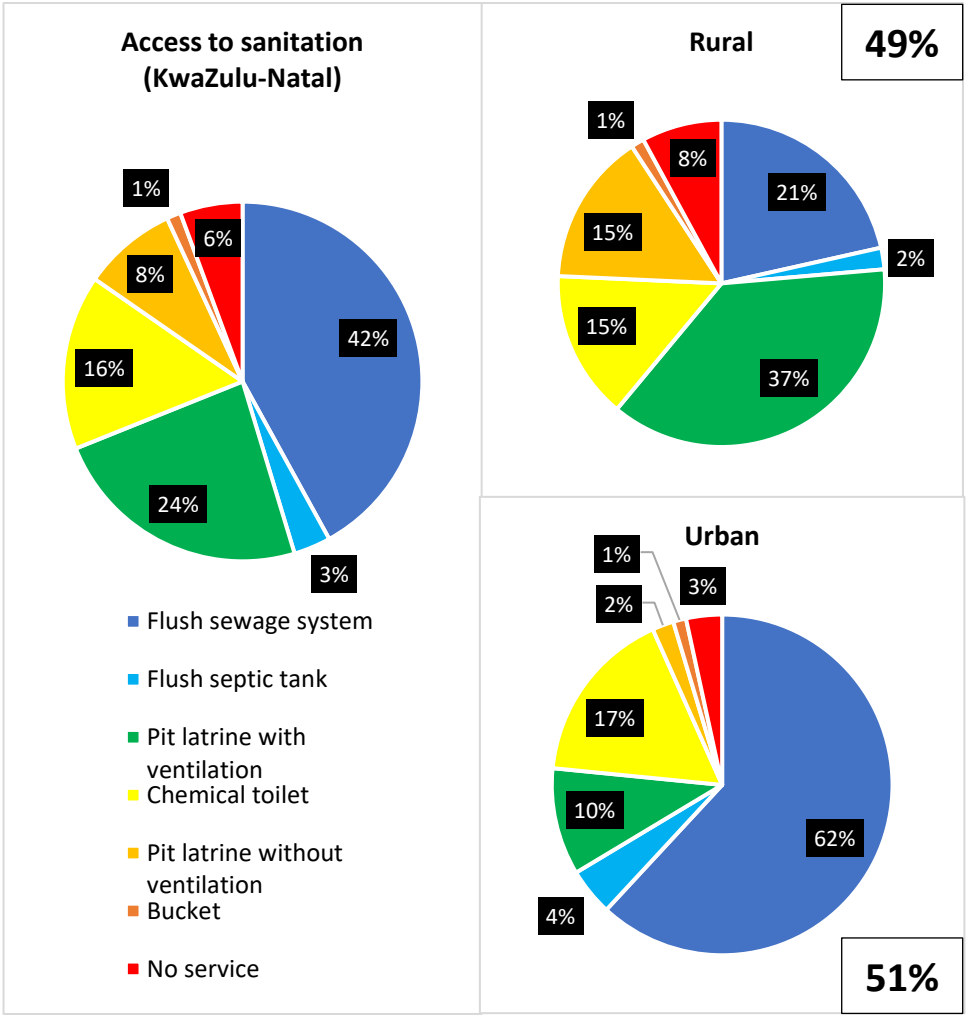


FIGURE 6-2: SANITATION SERVICE LEVELS PER HOUSEHOLD IN KWAZULU-NATAL

An analysis of sanitation provision by settlement type (see Figure 6-2 and Table 6-2) depicts a total number of 3 385 198 households in KwaZulu-Natal, of which 1 668 276 (49%) are rural settlements and 1 716 922 (51%) urban settlements (DWS, 2022b).

The data shows that provincially:

- **42%** of households have access to a flush toilet connected to the sewage system.
- **6%** of households do not have access to sanitation (implying open defecation).
- The remaining **52%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (24%), chemical toilets (16%), pit latrines without ventilation (8%) and bucket latrines (1%).

In rural settlements:

- **21%** of households have access to a flush toilet connected to the sewage system.
- **8%** of households do not have access to sanitation (implying open defecation).
- The remaining **71%** of households utilise some form of on-site sanitation system, including septic tanks (2%), pit latrines with ventilation (i.e. VIPs) (37%), chemical toilets (15%), pit latrines without ventilation (15%) and bucket latrines (1%).

In urban settlements:

- **62%** of households have access to a flush toilet connected to the sewage system.
- **3%** of households do not have access to sanitation (implying open defecation).
- The remaining **35%** of households utilise some form of on-site sanitation system, including septic tanks (4%), pit latrines with ventilation (i.e. VIPs) (10%), chemical toilets (17%), pit latrines without ventilation (2%) and bucket latrines (1%).

The analysis of sanitation provision by settlement type at the WSA level in KwaZulu-Natal is depicted in Figure 6-3 and detailed in Table 6-1 and Table 6-2.

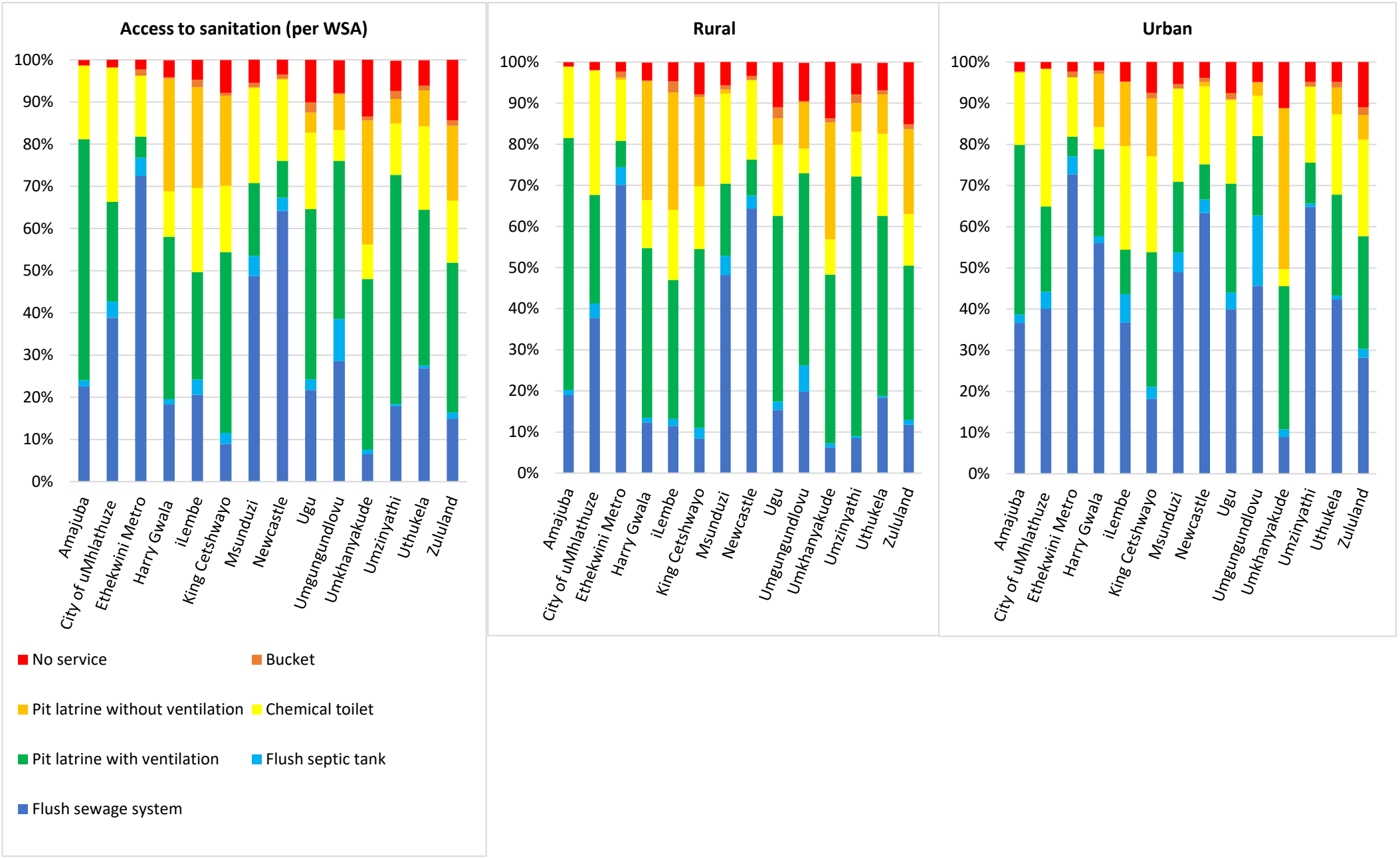


FIGURE 6-3: SANITATION SERVICE LEVELS PER HOUSEHOLD IN 14 WSAS IN KWAZULU-NATAL

TABLE 6-1: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN KWAZULU-NATAL (1)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Amajuba	33 727		7 616	23	490	1	19 269	57	5 879	17	0	0	24	0	430	1
Rural	26 831	80	5 087	19	352	1	16 428	61	4 664	17	0	0	7	0	274	1
Urban	6 896	20	2 529	37	138	2	2 841	41	1 215	18	0	0	17	0	156	2
City of uMhlathuze	125 668		48 803	39	4 856	4	29 702	24	39 944	32	0	0	148	0	2 212	2
Rural	64 233	51	24 195	38	2 320	4	16 972	26	19 419	30	0	0	52	0	1 272	2
Urban	61 435	49	24 608	40	2 536	4	12 730	21	20 525	33	0	0	96	0	940	2
Ethekwini Metro	1 243 770		901 045	72	54 001	4	62 074	5	179 450	14	758	0	17 856	1	28 590	2
Rural	144 019	12	100 949	70	6 181	4	9 261	6	21 459	15	758	1	2 031	1	3 387	2
Urban	1 099 751	88	800 096	73	47 820	4	52 813	5	157 991	14	0	0	15 825	1	25 203	2
Harry Gwala	169 353		30 983	18	2 110	1	65 188	38	18 292	11	45 238	27	582	0	6 734	4
Rural	146 153	86	17 990	12	1 725	1	60 280	41	17 043	12	42 225	29	403	0	6 260	4
Urban	23 200	14	12 993	56	385	2	4 908	21	1 249	5	3 013	13	179	1	474	2
iLembe	247 986		50 976	21	8 975	4	63 262	26	49 531	20	59 206	24	4 360	2	11 570	5
Rural	158 636	64	18 173	11	2 777	2	53 617	34	27 060	17	45 284	29	4 308	3	7 307	5
Urban	89 350	36	32 803	37	6 198	7	9 645	11	22 471	25	13 922	16	52	0	4 263	5
King Cetshwayo	128 188		11 421	9	3 364	3	55 010	43	20 140	16	27 312	21	873	1	9 977	8
Rural	121 510	95	10 207	8	3 168	3	52 828	43	18 585	15	26 370	22	783	1	9 477	8
Urban	6 678	5	1 214	18	196	3	2 182	33	1 555	23	942	14	90	1	500	7
Msunduzi	199 371		97 221	49	9 504	5	34 433	17	44 816	22	458	0	2 074	1	10 870	5
Rural	45 626	23	21 978	48	2 128	5	8 018	18	9 996	22	458	1	449	1	2 605	6
Urban	153 745	77	75 243	49	7 376	5	26 415	17	34 820	23	0	0	1 625	1	8 265	5

TABLE 6-2: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN KWAZULU-NATAL (2)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Newcastle	100 091		64 241	64	3 158	3	8 730	9	19 258	19	207	0	990	1	3 505	4
Rural	80 564	80	51 868	64	2 527	3	7 057	9	15 562	19	0	0	795	1	2 751	3
Urban	19 527	20	12 373	63	631	3	1 673	9	3 696	19	207	1	195	1	754	4
Ugu	226 082		49 062	22	5 771	3	91 254	40	40 924	18	10 811	5	5 404	2	22 749	10
Rural	167 881	74	25 796	15	3 434	2	75 828	45	29 084	17	10 770	6	4 484	3	18 382	11
Urban	58 201	26	23 266	40	2 337	4	15 426	27	11 840	20	41	0	920	2	4 367	8
Umgungundlovu	129 402		36 961	29	12 935	10	48 487	37	9 444	7	10 937	8	440	0	10 020	8
Rural	85 617	66	16 973	20	5 459	6	40 020	47	5 168	6	9 573	11	334	0	7 913	9
Urban	43 785	34	19 988	46	7 476	17	8 467	19	4 276	10	1 364	3	106	0	2 107	5
Umkhanyakude	235 962		15 321	6	2 600	1	95 438	40	19 258	8	69 448	29	2 090	1	31 852	13
Rural	213 215	90	13 286	6	2 175	1	87 530	41	18 320	9	60 558	28	2 090	1	29 301	14
Urban	22 747	10	2 035	9	425	2	7 908	35	938	4	8 890	39	0	0	2 551	11
Umzinyathi	155 414		27 724	18	845	1	84 464	54	18 889	12	9 036	6	2 990	2	11 070	7
Rural	129 627	83	11 013	8	631	0	81 897	63	14 131	11	9 036	7	2 705	2	9 818	8
Urban	25 787	17	16 711	65	214	1	2 567	10	4 758	18	0	0	285	1	1 252	5
Uthukela	177 946		47 919	27	1 171	1	65 582	37	35 250	20	15 126	9	1 989	1	10 663	6
Rural	113 909	64	20 820	18	571	1	49 884	44	22 742	20	10 961	10	1 125	1	7 563	7
Urban	64 037	36	27 099	42	600	1	15 698	25	12 508	20	4 165	7	864	1	3 100	5
Zululand	212 238		31 803	15	2 945	1	75 358	36	31 266	15	37 614	18	2 863	1	30 317	14
Rural	170 455	80	20 019	12	2 055	1	63 922	38	21 463	13	35 121	21	2 071	1	25 732	15
Urban	41 783	20	11 784	28	890	2	11 436	27	9 803	23	2 493	6	792	2	4 585	11
KwaZulu-Natal	**3 385 198**		**1 421 096**	**42**	**112 725**	**3**	**798 251**	**24**	**532 341**	**16**	**286 151**	**8**	**42 683**	**1**	**190 559**	**6**
Rural	**1 668 276**	**49**	**358 354**	**21**	**35 503**	**2**	**623 542**	**37**	**244 696**	**15**	**251 114**	**15**	**21 637**	**1**	**132 042**	**8**
Urban	**1 716 922**	**51**	**1 062 742**	**62**	**77 222**	**4**	**174 709**	**10**	**287 645**	**17**	**35 037**	**2**	**21 046**	**1**	**58 517**	**3**

6.3 Bucket and chemical toilets in KwaZulu-Natal

Are bucket toilets still in use?

Bucket toilets should have already been eradicated in South Africa. Yet, as of 2023, there are still more than 42 000 households in KwaZulu-Natal using bucket toilets (DWS, 2023b), as illustrated in Figure 6-4.

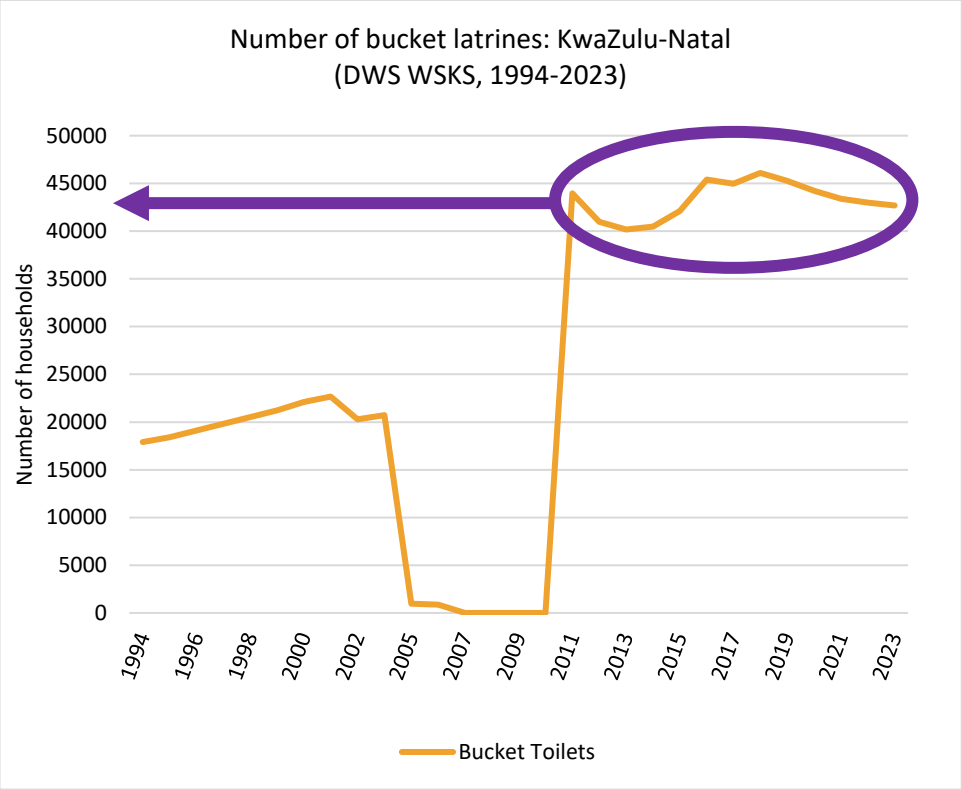


FIGURE 6-4: NUMBER OF HOUSEHOLDS WITH BUCKET LATRINES IN KWAZULU-NATAL FROM 1994 TO 2023

Are chemical toilets an issue?

Currently, more than 532 000 households in KwaZulu-Natal are served by chemical toilets (DWS, 2023b), as illustrated in Figure 6-5. Can the province afford this?

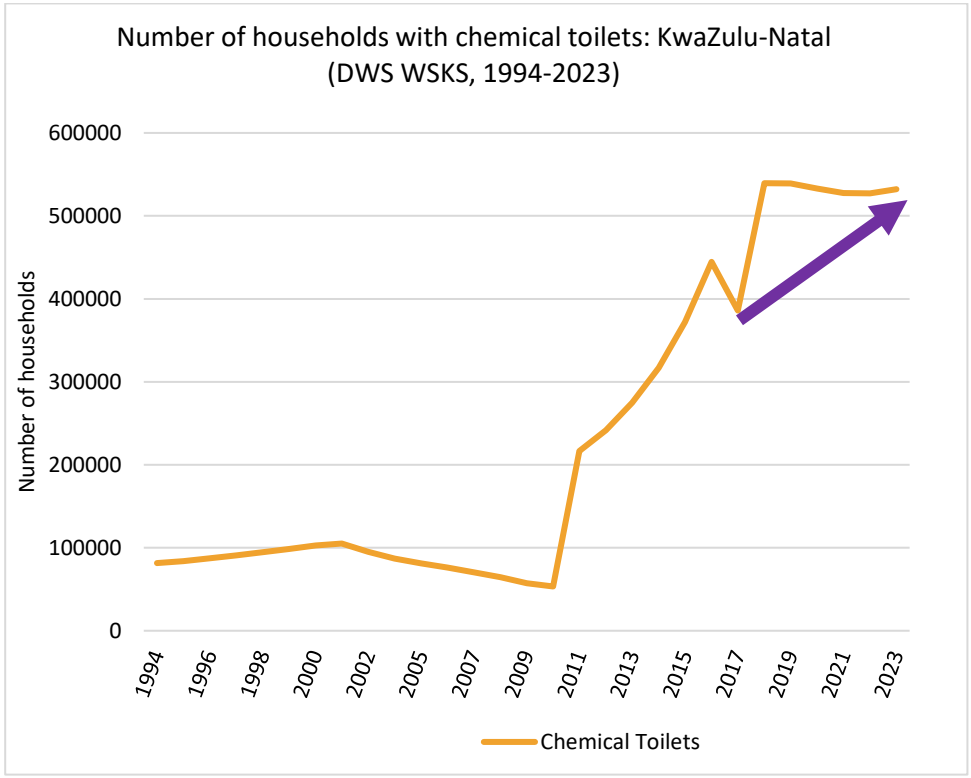


FIGURE 6-5: NUMBER OF HOUSEHOLDS WITH CHEMICAL TOILETS IN KWAZULU-NATAL FROM 1994 TO 2023

Assuming 2.5 households are served per chemical toilet (i.e. ~10 people per toilet, ~212 800 chemical toilets in operation), and chemical toilet rental costs of R750/month, this equates to a cost of **~R160 million/month** or **~R1 915 million/year**.

Could innovative sanitation alternatives meet the same needs (or perform even better) at a lower cost?

6.4 Progress on eradicating sanitation backlog

Is KwaZulu-Natal on target to eradicate sanitation backlogs?

Almost all WSAs in KwaZulu-Natal have significant overall backlog (i.e. inappropriate sanitation systems and no sanitation systems). Ethekwini Metro has the lowest backlog of 19%. Figure 6-6 shows the percentage of appropriate, inappropriate and unacceptable sanitation for each WSA in KwaZulu-Natal, as well as the overall statistics for the province.

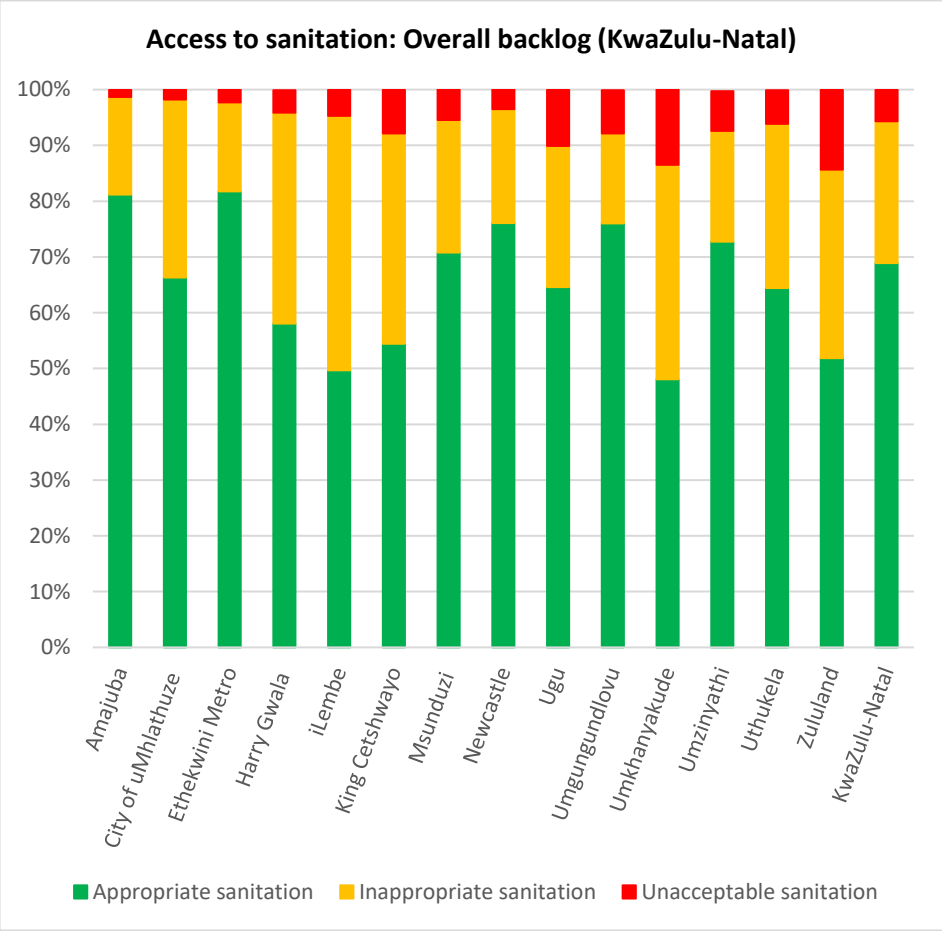


FIGURE 6-6: ACCESS TO SANITATION AND OVERALL BACKLOG IN KWAZULU-NATAL

TABLE 6-3: RATE OF SANITATION DELIVERY AND LIKELIHOOD OF WSAS IN KWAZULU-NATAL TO ACHIEVE BACKLOG ERADICATION

Rate of delivery (years to eradicate backlog)	End date	Years to achieve
Amajuba	2022	1
City of uMhlathuze (as of 2021)	2031	10
Ethekwini Metro	2032	11
Harry Gwala	2038	17
iLembe	2040	19
King Cetshwayo	2031	10
Msunduzi	2030	9
Newcastle	2028	7
Ugu	2038	17
Umgungundlovu	2029	8
Umkhanyakude	2035	14
Umzinyathi	2030	9
Uthukela	2033	12
Zululand	2048	27

NOTE: The figures above were calculated in 2021. Has there been progress since then? Has the rate of sanitation service delivery (i) increased, (ii) stayed the same, or (iii) decreased? Understanding (a) sanitation backlog and (b) the rate of sanitation service delivery will help to determine if WSAs are on track to meet sanitation access-related SDGs.

From Table 6-3 above:

- 5 WSAs have a good chance of eradicating their backlog by 2030 (green).
- 3 WSAs are likely to make progress but are likely to eradicate backlogs only partially (yellow).
- 6 WSAs are not addressing their backlogs quickly enough and are unlikely to achieve backlog eradication.

6.5 Municipal sanitation status: KwaZulu-Natal

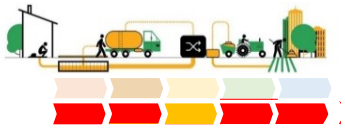
Where is KwaZulu-Natal doing well?

Access to sanitation has improved since 1994, but the status of containment, emptying and transport has been categorised as 'poor' and treatment has been categorised as 'average' for KwaZulu-Natal. The status of disposal and reuse has also been categorised as 'poor' for KwaZulu-Natal. Therefore, the overall status of the sanitation service chain is categorised as 'poor'. Institutional aspects are also far from ideal. There appears to be little innovation or value add related to the sanitation sector in the province. Challenges are compounded by growing informal settlements in urban settlements. Unfortunately, there is still much work to do to improve sanitation in the province.

water & sanitation
Department: Water and Sanitation
REPUBLIC OF SOUTH AFRICA

National Sanitation Integrated Plan

Provincial Status Report
KwaZulu-Natal



Provincial Status	National Status
Poor	

Total Provinces 9

			Data Set (*indicates number of WSAs with data submitted*)
Context			
Population (DWS WSKS) (April 2023)	11535308		14 / 14
Number of households (DWS WSKS) (April 2023)	3385198 HH		14 / 14
Number of wastewater treatment works	147		14 / 14
Number of sewer pump stations	578		14 / 14
Length of sewer pipelines	12690 km		7 / 14
Containment		**Poor**	
1.1 No sanitation (backlog) (DWS WSKS) (April 2023)	6 % HH	Poor	14 / 14
1.2 Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)	31 % HH	Poor	14 / 14
1.3 Average rate of sanitation delivery (years to eradicate backlog)	12 years	Average	14 / 14
Emptying and Transport		**Poor**	
2.1 Sewer network condition	NI		0 / 14
2.2 Pit toilet emptying	43 % of WSAs	Poor	11 / 14
2.3 Vacuum truck / honeysucker needs	45 trucks	Poor	10 / 14
2.4 Vacuum truck / honeysucker condition	43 % in fair condition	Average	10 / 14
Treatment		**Average**	
3.1 % of wastewater treatment works design capacity utilised	57 %	Good	14 / 14
3.1.1 Design capacity	1121.7 Ml/d		14 / 14
3.1.2 Available capacity	1055.8 Ml/d		14 / 14
3.1.3 Operational capacity	633.7 Ml/d		14 / 14
3.2 Wastewater treatment works effluent quality	60 % compliance	Poor	14 / 14
3.2.1 Microbiological compliance	52 %		14 / 14
3.2.2 Chemical compliance	60 %		14 / 14
3.2.3 Physical compliance	67 %		14 / 14
3.3 Wastewater treatment works staffing shortfall	53 %	Poor	14 / 14
3.3.1 Number of supervisor(s): Compliant	42		14 / 14
3.3.2 Number of supervisor(s): Shortfall	28		14 / 14
3.3.3 Number of PC(s): Compliant	146		14 / 14
3.3.4 Number of PC(s): Shortfall	186		14 / 14
Disposal and Reuse		**Poor**	
4.1 Analysis and classification of wastewater sludge	43 % of WSAs	Poor	11 / 14
4.2 Wastewater sludge management	14 % acceptable practices		11 / 14
4.3 Analysis and classification of faecal sludge	14 % of WSAs	Poor	10 / 14
4.4 Faecal sludge management	64 % acceptable practices		11 / 14
4.5 Treated wastewater effluent reuse	7 % of WSAs	Poor	11 / 14
Institutional Aspects		**Poor**	
5.1 Green Drop performance (2021)	68 %	Poor	14 / 14
5.2 Sanitation staff vacancies	61 %	Poor	9 / 14
5.3 Sanitation business financial status	50 % of WSAs operate a deficit	Poor	9 / 14
5.4 Growing informal settlements	14 % of WSAs		4 / 14
5.5 Shit-flow diagrams developed for sanitation systems	21 % of WSAs		10 / 14
5.6 Alternative/innovative sanitation processes or technologies implemented	36 % of WSAs have implement multiple		14 / 14
5.6.1 Toilets	*29* % of WSAs		11 / 14
5.6.2 Emptying	*21* % of WSAs		10 / 14
5.6.3 Transport	*29* % of WSAs		11 / 14
5.6.4 Treatment	*43* % of WSAs		11 / 14
5.6.5 Disposal benefication	*14* % of WSAs		10 / 14
5.6.6 New business models	*21* % of WSAs		9 / 14

FIGURE 6-7: SANITATION STATUS IN KWAZULU-NATAL

6.6 1st order excreta flow diagram (SFD): KwaZulu-Natal

What are some of the contributors to poor sanitation performance?

The 1st order SFD for KwaZulu-Natal (Figure 6-8) highlights significant gaps in the sanitation service chain. These deficiencies all potentially have a negative impact on communities.

Containment:

- Inappropriately constructed on-site sanitation systems (e.g. unsealed on-site sanitation systems)

Emptying and transport:

- Lost sewage due to old or leaking pipes
- Inadequate maintenance and servicing of basic sanitation systems (e.g. not emptied)
- Lack of control of transportation of FS (no monitoring or management)

Treatment:

- Poorly operated, maintained and managed WWTWs resulting in poor performance or non-compliance

End-use and disposal:

- Inadequate sludge analysis and classification, and resultant inappropriate sludge disposal and/or non-beneficial use

Institutional:

- Inadequate sanitation systems or programme funding

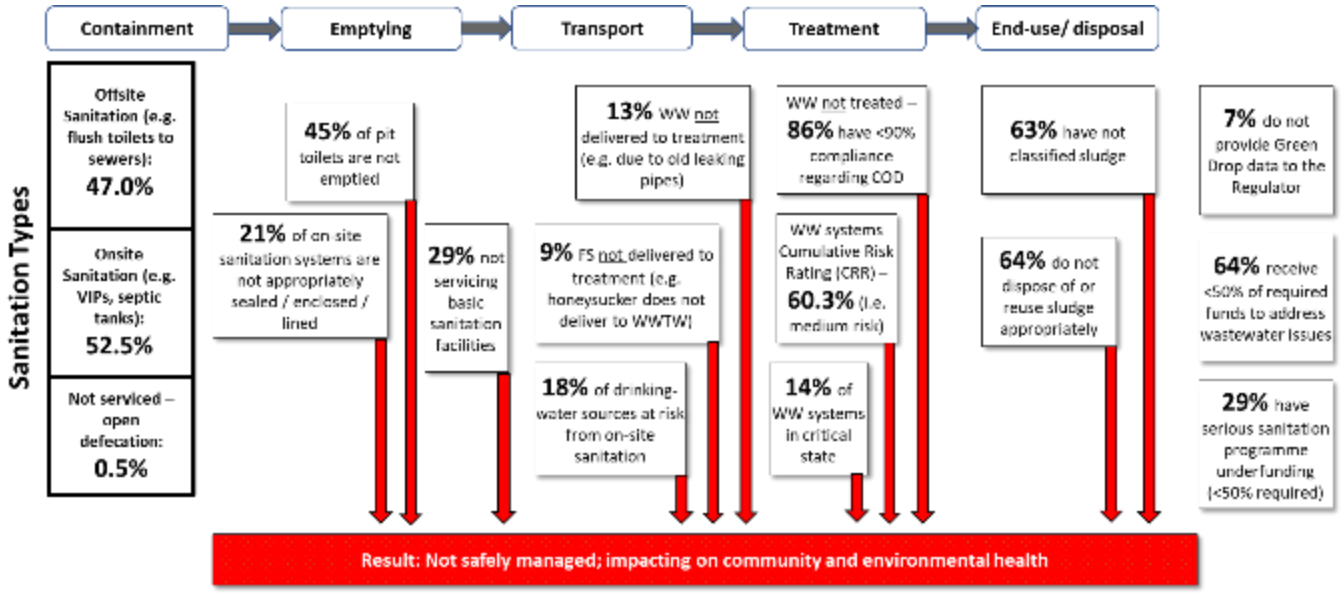


FIGURE 6-8: 1ST ORDER SFD: KWAZULU-NATAL

6.7 Sanitation status along the service chain

An analysis of the sanitation service chain shows that there is still much work to be done.

A total of 15 indicators were selected and analysed to assess the status of the sanitation service chain, focusing on the quality of available data. This includes three indicators for each of the four service chain components, plus three additional indicators addressing institutional aspects. The analysis results for KwaZulu-Natal, obtained from the situational analysis tool developed as part of the NSIP Project, are presented visually in Figure 6-9 to Figure 6-11. The colour coding used in the analysis indicates effectiveness levels based on predefined scoring criteria. Green signifies that systems are functioning well and meeting expectations, while amber indicates average performance with identified areas for improvement. In contrast, red highlights poor performance or significant issues that require immediate attention (refer to Appendix B of the Monitoring Framework and Guide for detailed scoring rules). The visual representation in Figure 6-9 provides a comprehensive overview of the sanitation status along the service chain for all provinces in the country, allowing for quick and easy assessment at a glance.

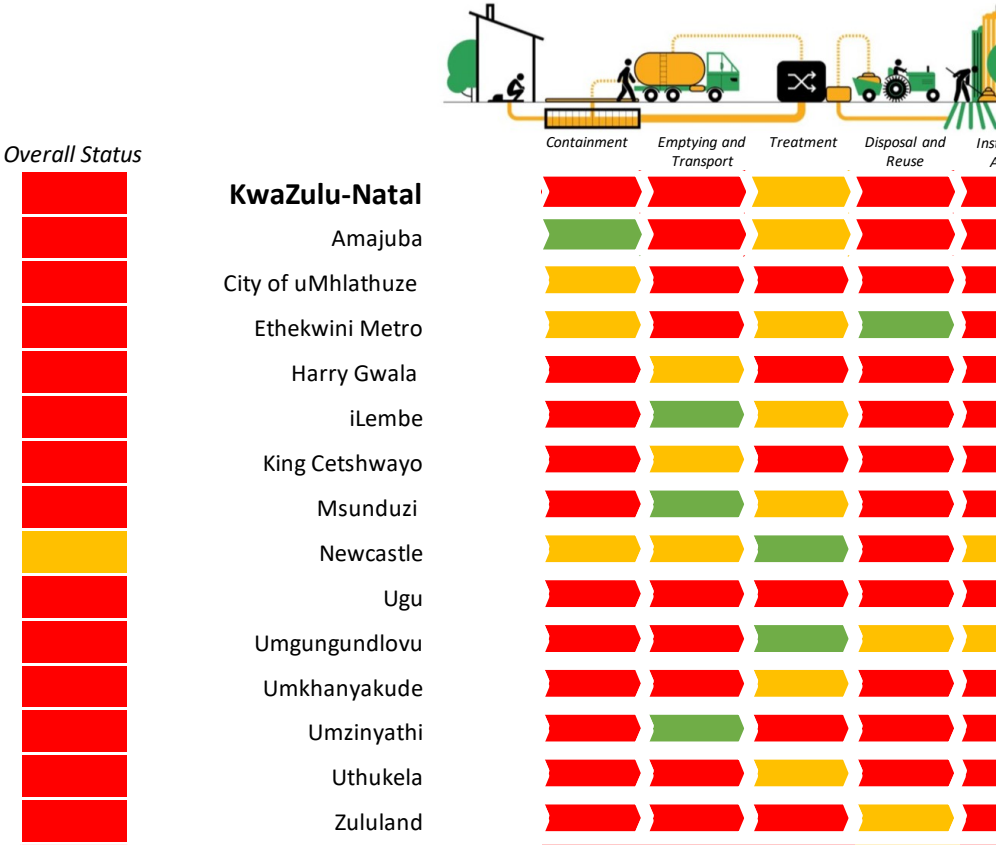


FIGURE 6-9: OVERVIEW OF SANITATION STATUS ALONG THE SERVICE CHAIN FOR WSAS IN KWAZULU-NATAL

Overall score	
>75%	Good
50%-75%	Average
<50%	Poor

- The performance of KwaZulu-Natal and most WSAs falls short of the desired standard, with just one WSA (Newcastle) achieving an 'average' overall status.
- The health of the sanitation service chain is notably deficient, with containment, emptying and transport, disposal and reuse and institutional aspects categorised as 'poor' for the majority of WSAs. However, pockets of good performance are observed intermittently.
- One WSA (eThekwini Metro) stands out as the only good performer in disposal and reuse practices.
- Notably, treatment seems to be performing relatively better than other elements, although not ideal.
- Significant efforts are still required to enhance sanitation practices in KwaZulu-Natal.

6.7.1 Heat map: KwaZulu-Natal

The heat map further highlights key deficiencies in the sanitation service chain.

The results of the analysis of the 15 indicators are represented for all the WSAs in KwaZulu-Natal in the heat map in Figure 6-10. Green signifies that systems are functioning well and meeting the expectations defined by the scoring criteria. Amber indicates average performance, suggesting areas that require improvement, while red highlights poor performance or significant issues that demand immediate attention. Although there are pockets of good performance, overall, the performance is far from ideal.

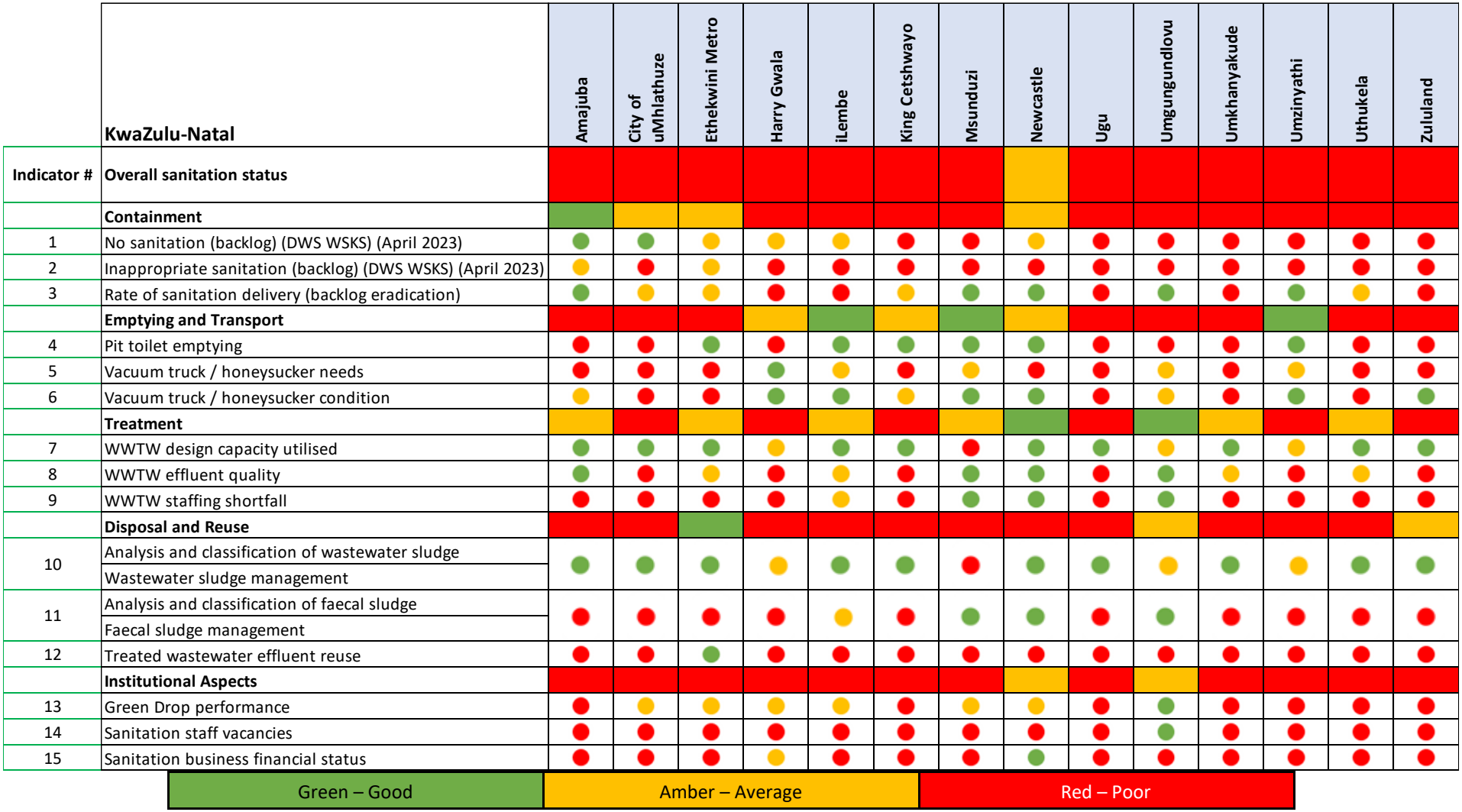


FIGURE 6-10: HEAT MAP SHOWING THE STATUS OF THE 15 INDICATORS FOR WSAS IN KWAZULU-NATAL

6.7.2 Rating WSAs in KwaZulu-Natal: Sanitation service chain elements

The performance of each of the 15 indicators of the sanitation service chain highlights key deficiencies at WSAs.

Using the heat map and total scores of the 15 indicators, each WSA in KwaZulu-Natal is ranked from poorest-performing on the left to best-performing on the right, as shown in Figure 6-11. WSAs facing significant challenges across the sanitation service chain, including related institutional factors, are marked mostly in red, starting on the far left, while those that are performing well are indicated mostly in green, moving towards the far right.

The 15 sanitation service chain elements that are rated are indicated below:

	Containment
1.	No sanitation (backlog)
2.	Inappropriate sanitation (backlog)
3.	Rate of sanitation delivery (years to eradicate backlog)
	Emptying and transport
4.	Pit toilet emptying
5.	Vacuum truck/honeysucker needs
6.	Vacuum truck/honeysucker condition
	Treatment
7.	WWTW design capacity utilised
8.	WWTW effluent quality
9.	WWTW staffing shortfall
	Disposal and reuse
10.	Analysis and classification of wastewater sludge
	Wastewater sludge management
11.	Analysis and classification of FS
	FSM
12.	Treated wastewater effluent reuse
	Institutional aspects
13.	Green Drop performance (2021)
14.	Sanitation staff vacancies
15.	Sanitation business financial status

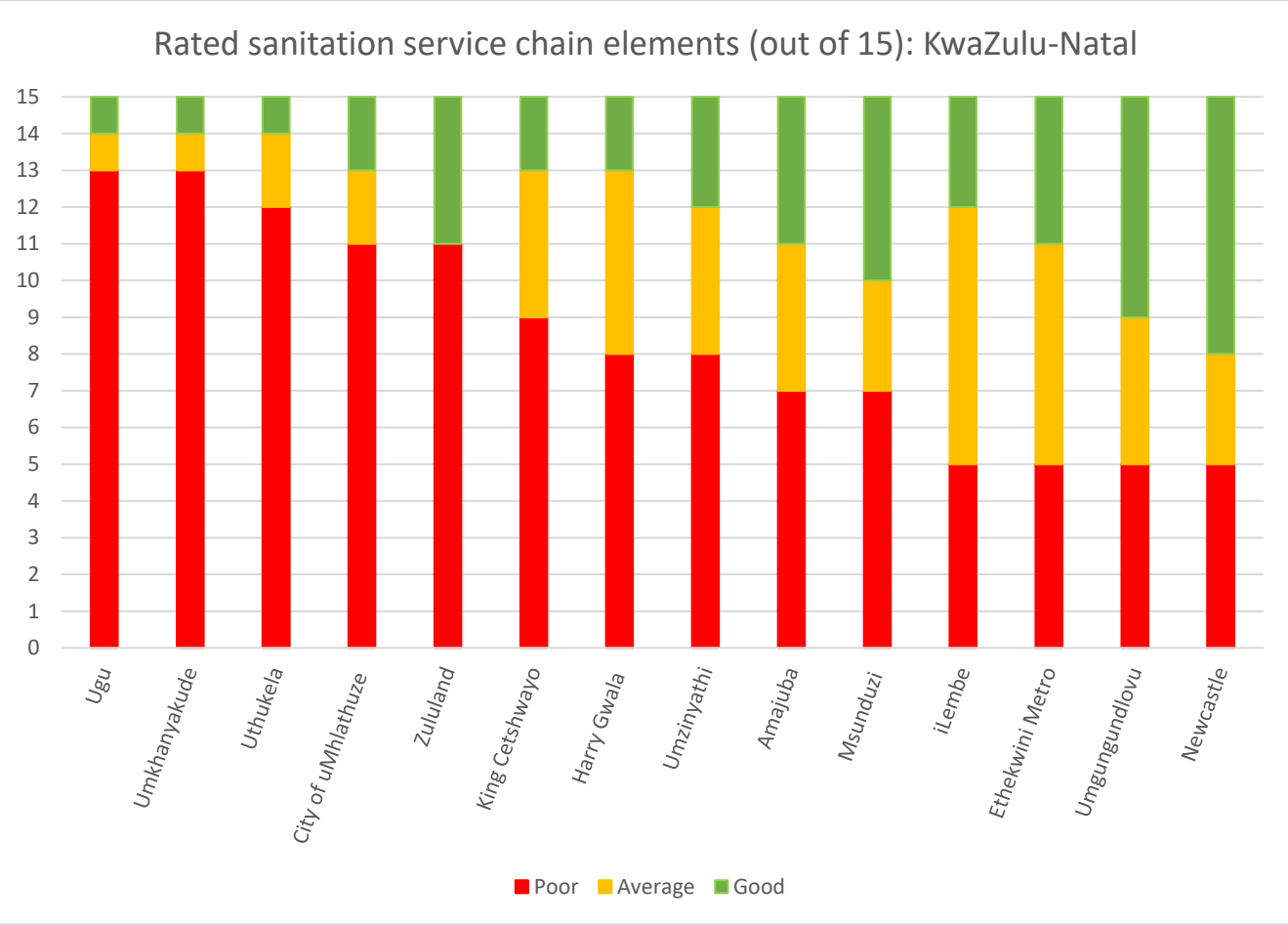


FIGURE 6-11: RATED WSAS IN KWAZULU-NATAL BASED ON THE PERFORMANCE OF THE 15 INDICATORS (LEFTMOST COLUMN = POOREST PERFORMER; RIGHTMOST COLUMN = BEST PERFORMER)

6.8 Key findings: KwaZulu-Natal

Is KwaZulu-Natal's sanitation in good health?

The analysis below provides a snapshot of KwaZulu-Natal's sanitation status as of 2022/23.

Overall

The sanitation status of the province can be categorised as 'poor'.

Access to sanitation/Containment

KwaZulu-Natal has a near-even rural–urban split, with 49% of households in rural areas and 51% in urban areas. Overall, 42% of households in the province are connected to the sewer system, while 52% rely on on-site sanitation. Additionally, 6% of the households have no access to sanitation. Consistent with the general trend across South Africa, urban areas in KwaZulu-Natal have better access to sewered systems, with 62% of urban households connected to the sewer network. In contrast, rural areas are more dependent on on-site sanitation solutions, with 71% of rural households using on-site sanitation systems.

Bucket and chemical toilets

Although the use of bucket toilets has declined between 2018 and 2023, as of 2023, over 42 000 households in the province continue to rely on bucket toilets. In contrast, the number of households using chemical toilets has slightly increased over the past year, with more than 530 000 households served by chemical toilets, making it the province with the highest number of households using chemical toilets (DWS, 2023b). The continued use of bucket toilets and the increasing reliance on chemical toilets contribute to the ongoing 'inappropriate sanitation' backlog across WSAs in the province. These types of sanitation solutions, while providing a temporary alternative, do not meet the standards of more permanent and hygienic sanitation infrastructure.

Sanitation backlog

Overall, KwaZulu-Natal is not on track to meet sector targets by 2030 (e.g. SDG 6.2).

Eight WSAs (King Cetshwayo, Msunduzi, Ugu, uMgungundlovu, uMkhanyakude, uMzinyathi, uThukela and Zululand) have a 'no service' backlog exceeding 5%, which is categorised as 'poor'. Twelve WSAs (City of uMhlathuze, Harry Gwala, iLembe, King Cetshwayo, Msunduzi, Newcastle, Ugu, uMgungundlovu, uMkhanyakude, uMzinyathi, uThukela and Zululand) have an 'inappropriate sanitation' backlog exceeding 20%, also categorised as 'poor'. Given the current rate of sanitation delivery (years to eradicate backlog), it is highly unlikely that five WSAs (Harry Gwala, iLembe, Ugu, uMkhanyakude and Zululand) will eradicate their backlog by 2030.

Emptying and transport

Eight WSAs (Amajuba, City of uMhlathuze, Harry Gwala, Ugo, Umgungundlovu, uMkhanyakude, uThukela and Zululand) indicated that they do not empty pits. This means that users need to empty their own pits, dig their own new pits, or resort to other means. WSAs need to ensure that users are aware of appropriate safety and hygiene measures to follow.

Nine WSAs (Amajuba, City of uMhlathuze, Ethekwini Metro, King Cetshwayo, Newcastle, Ugu, uMkhanyakude, uThukela and Zululand) indicated that they have a significant shortage of vacuum trucks and honeysuckers, with their need exceeding 100% of their current fleet (i.e. they need to at least double their fleet). This result also seems to indicate that pit-emptying could currently be limited by the number of vacuum trucks and honeysuckers available. Furthermore, the condition of most of the existing vacuum trucks and honeysuckers is far from ideal, with five WSAs (City of uMhlathuze, Ethekwini Metro, Ugu, uMkhanyakude and uThukela) indicating that they are in a poor condition. This implies that breakdowns are inevitable and indicates a further vulnerability in emptying and transport.

Treatment

Most WSAs appear to use the WWTWs within their design capacity. However, one WSA (Msunduzi) has a WWTW where the design capacity exceeds 90% utilisation. Despite the spare treatment capacity, the performance of many WWTWs is not ideal, with six WSAs (City of uMhlathuze, Harry Gwala, King Cetshwayo, Ugo, uMzinyathi and Zululand) having a treated effluent quality with an overall compliance of less than 50%. Most WSAs indicated a significant challenge with WWTW staffing, with 10 WSAs (Amajuba, City of uMhlathuze, Ethekwini Metro, Harry Gwala, King Cetshwayo, Ugu, uMkhanyakude, uMzinyathi, uThukela and Zululand) indicating an overall staffing shortfall greater than 35%. This could contribute to the noted performance challenges.

Disposal and reuse

Six WSAs (City of uMhlathuze, Harry Gwala, Newcastle, Ugu, uMkhanyakude and uThukela) scored poorly for wastewater sludge management as they do not analyse

and classify their wastewater sludge and/or do not proactively manage their sludge end-use and disposal.

Four WSAs (City of uMhlathuze, Msunduzi, uMkhanyakude and Uthukela) scored poorly for FSM as they do not analyse and classify their FS and/or do not proactively manage their sludge end-use and disposal. Despite this, it is noted that six WSAs co-treat FS at their WWTW. This could also be contributing to the poor performance noted. Thirteen WSAs (Amajuba, City of uMhlathuze, Harry Gwala, iLembe, King Cetshwayo, Msunduzi, Newcastle, Ugu, uMgungundlovu, uMkhayakude, uMzinyathi, Uthukela and Zululand) do not reuse treated wastewater effluent for any purpose. This lack of reuse could be because of the poor treated effluent quality.

Institutional aspects

Seven WSAs (Amajuba, King Cetshwayo, Ugu, uMkhanyakude, uMzinyathi, uThukela and Zululand) have very poor Green Drop performance, scoring less than 50%. Thirteen WSAs (Amajuba, City of uMhlathuze, Ethekwini Metro, Harry Gwala, iLembe, King Cetshwayo, Msunduzi, Newcastle, Ugu, uMkhayakude, uMzinyathi, Uthukela and Zululand) have significant sanitation staff challenges with sanitation staff vacancies of more than 35%.

Twelve WSAs (Amajuba, City of uMhlathuze, Ethekwini Metro, iLembe, King Cetshwayo, Msunduzi, Ugu, uMgungundlovu, uMkhanyakude, uMzinyathi, uThukela and Zululand) indicated that the financial status of their sanitation business is far from ideal and that they are running at a deficit.

7 Situational analysis: Limpopo

Section 7 provides a summary of data and findings from the **Limpopo Situational Analysis** report.

For access to the full report, scan the QR code above.

What is the current reality in the province?

7.1 Limpopo overview

Water services authorities

WSAs are responsible for supplying both water and sanitation services to households in their area of jurisdiction. In Limpopo, there are:

- 5 district municipalities
- 22 local municipalities
- 10 WSAs

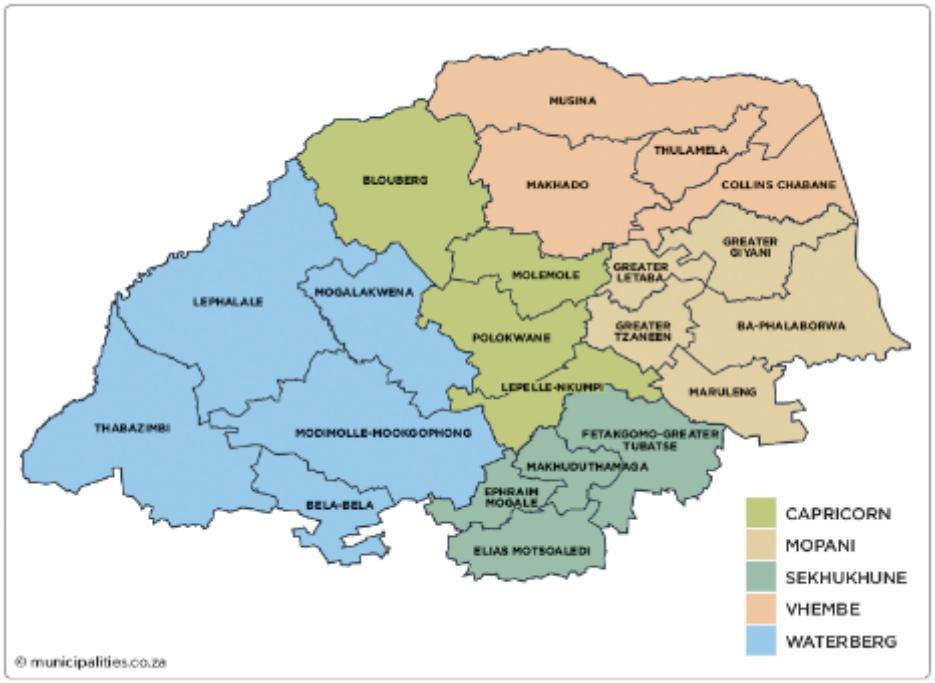


FIGURE 7-1: MUNICIPALITIES AND WSAS IN LIMPOPO

District municipalities	
Capricorn*	Vhembe*
Mopani*	Waterberg
Sekhukhune*	

Local municipalities	
Blouberg	Fetakgomo Tubatse
Lepelle-Nkumpi	Makhuduthamaga
Molemole	Collins Chabane
Polokwane*	Makhado
Ba-Phalaborwa	Musina
Greater Giyani	Thulamela
Greater Tzaneen	Bela-Bela*
Maruleng	Lephalale*
Greater Letaba	Modimolle-Mookgophong *
Elias Motsoaledi	Mogalakwena*
Ephraim Mogale	Thabazimbi*

(* indicates WSA)

7.2 Access to sanitation: Households

Sanitation service levels per household: A provincial view

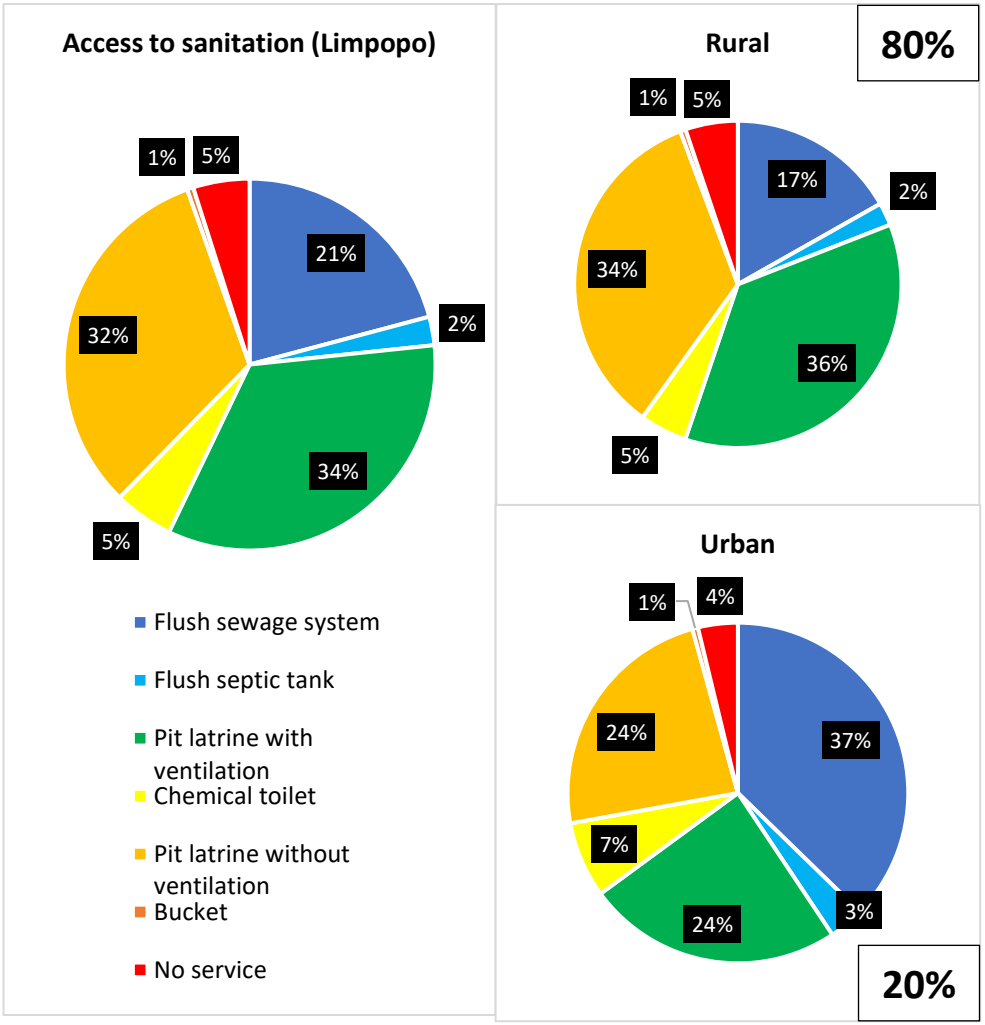


FIGURE 7-2: SANITATION SERVICE LEVELS PER HOUSEHOLD IN LIMPOPO

An analysis of sanitation provision by settlement type (see Figure 7-2 and Table 7-1) depicts a total number of 1 602 607 households in Limpopo, of which 1 285 481 (80%) are rural settlements and 317 126 (20%) urban settlements (DWS, 2022b).

The data shows that provincially:

- **21%** of households have access to a flush toilet connected to the sewage system.
- **5%** of households do not have access to sanitation (implying open defecation).
- The remaining **74%** of households utilise some form of on-site sanitation system, including septic tanks (2%), pit latrines with ventilation (i.e. VIPs) (34%), chemical toilets (5%), pit latrines without ventilation (32%) and bucket latrines (1%).

In rural settlements:

- **17%** of households have access to a flush toilet connected to the sewage system.
- **5%** of households do not have access to sanitation (implying open defecation).
- The remaining **78%** of households utilise some form of on-site sanitation system, including septic tanks (2%), pit latrines with ventilation (i.e. VIPs) (36%), chemical toilets (5%), pit latrines without ventilation (34%) and bucket latrines (1%).

In urban settlements:

- **37%** of households have access to a flush toilet connected to the sewage system.
- **4%** of households do not have access to sanitation (implying open defecation).
- The remaining **59%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (24%), chemical toilets (7%), pit latrines without ventilation (24%) and bucket latrines (1%).

The analysis of sanitation provision by settlement type at the WSA level in Limpopo is depicted in Figure 7-3 and detailed in Table 7-1.

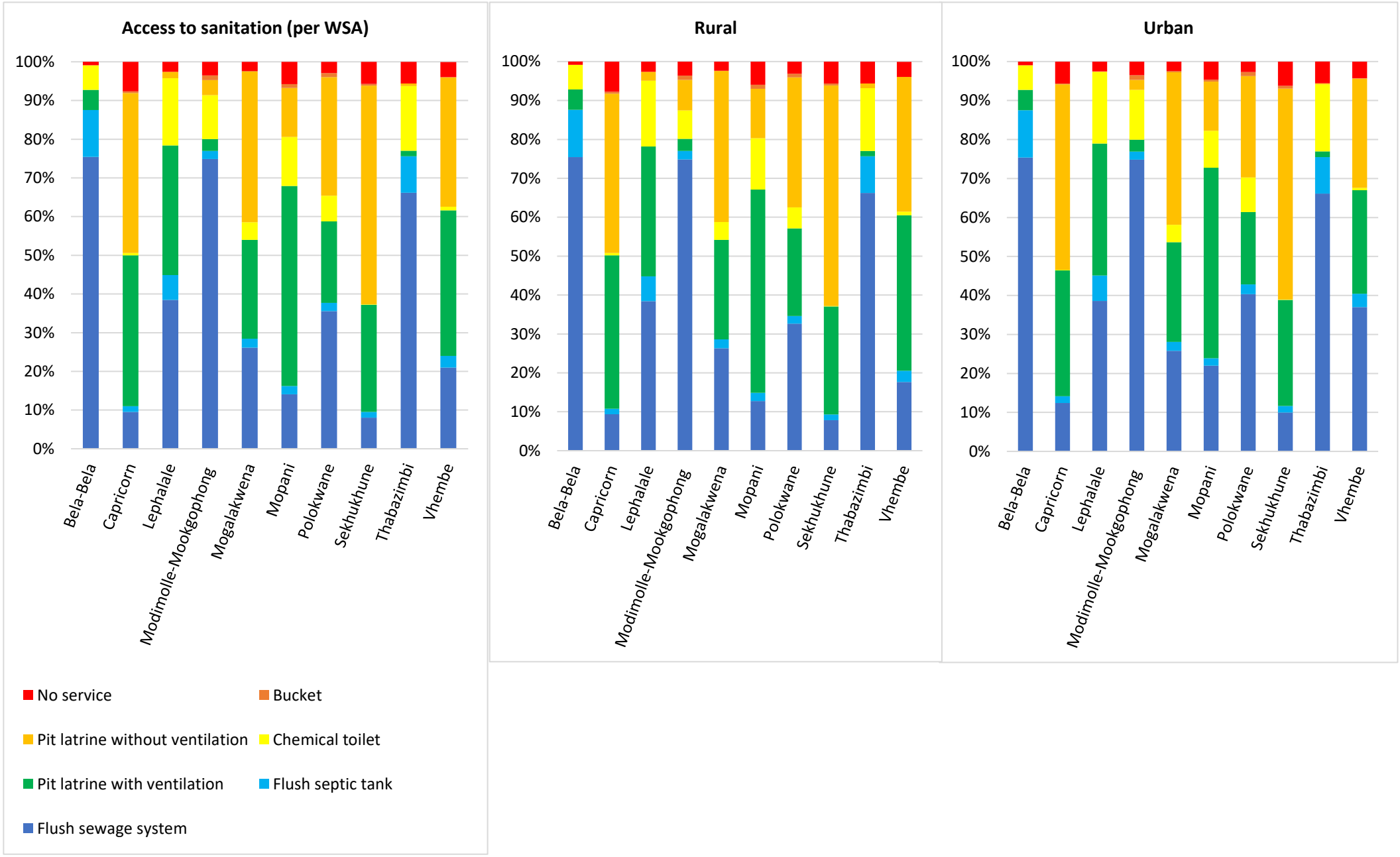


FIGURE 7-3: SANITATION SERVICE LEVELS PER HOUSEHOLD IN 10 WSAS IN LIMPOPO

TABLE 7-1: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAs) IN LIMPOPO

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Bela-Bela	20 918		15 775	75	2 540	12	1 090	5	1 326	6	0	0	0	0	189	1
Rural	7 824	37	5 901	75	955	12	407	5	497	6	0	0	0	0	65	1
Urban	13 094	63	9 874	75	1 585	12	683	5	829	6	0	0	0	0	124	1
Capricorn	226 368		21 610	10	3 304	1	88 247	39	1 308	1	93 590	41	1 089	0	17 171	8
Rural	212 691	94	19 911	9	3 064	1	83 838	39	1 282	1	87 084	41	1 064	1	16 398	8
Urban	13 677	6	1 699	12	240	2	4 409	32	26	0	6 506	48	25	0	773	6
Lephalale	42 122		16 210	38	2 705	6	14 114	34	7 302	17	698	2	0	0	1 090	3
Rural	29 749	71	11 432	38	1 901	6	9 921	33	5 033	17	680	2	0	0	778	3
Urban	12 373	29	4 778	39	804	6	4 193	34	2 269	18	18	0	0	0	312	3
Modimolle-Mookgophong	28 380		21 244	75	592	2	871	3	3 228	11	1 106	4	340	1	999	4
Rural	7 247	26	5 423	75	160	2	223	3	531	7	569	8	80	1	260	4
Urban	21 133	74	15 821	75	432	2	648	3	2 697	13	537	3	260	1	739	3
Mogalakwena	80 950		21 169	26	1 855	2	20 685	26	3 694	5	31 505	39	124	0	1 925	2
Rural	53 729	66	14 147	26	1 227	2	13 726	26	2 486	5	20 842	39	36	0	1 270	2
Urban	27 221	34	7 022	26	628	2	6 959	26	1 208	4	10 663	39	88	0	655	2
Mopani	331 461		46 606	14	7 061	2	171 482	52	41 914	13	42 034	13	3 277	1	19 043	6
Rural	283 761	86	36 115	13	6 163	2	148 170	52	37 381	13	36 019	13	3 046	1	16 824	6
Urban	47 700	14	10 491	22	898	2	23 312	49	4 533	10	6 015	13	231	0	2 219	5
Polokwane	234 273		83 277	36	5 056	2	49 284	21	15 638	7	71 803	31	2 319	1	6 889	3
Rural	146 501	63	47 857	33	2 890	2	32 972	23	7 867	5	48 943	33	1 431	1	4 533	3
Urban	87 772	37	35 420	40	2 166	2	16 312	19	7 771	9	22 860	26	888	1	2 356	3
Sekhukhune	318 907		25 614	8	4 763	1	88 296	28	292	0	180 267	57	1 507	0	18 124	6
Rural	292 609	92	22 988	8	4 324	1	81 135	28	261	0	166 048	57	1 322	0	16 488	6
Urban	26 298	8	2 626	10	439	2	7 161	27	31	0	14 219	54	185	1	1 636	6
Thabazimbi	34 728		22 985	66	3 265	9	487	1	5 810	17	241	1	0	0	1 942	6
Rural	16 099	46	10 667	66	1 518	9	217	1	2 599	16	193	1	0	0	905	6
Urban	18 629	54	12 318	66	1 747	9	270	1	3 211	17	48	0	0	0	1 037	6
Vhembe	284 500		59 723	21	8 536	3	107 055	38	2 561	1	95 229	33	66	0	11 213	4
Rural	235 271	83	41 511	18	6 846	3	93 985	40	2 243	1	81 429	35	35	0	9 103	4
Urban	49 229	17	18 212	37	1 690	3	13 070	27	318	1	13 800	28	31	0	2 110	4
Limpopo	**1 602 607**		**334 213**	**21**	**39 677**	**2**	**541 611**	**34**	**83 073**	**5**	**516 473**	**32**	**8 722**	**1**	**78 585**	**5**
Rural	**1 285 481**	**80**	**215 952**	**17**	**29 048**	**2**	**464 594**	**36**	**60 180**	**5**	**441 807**	**34**	**7 014**	**1**	**66 624**	**5**
Urban	**317 126**	**20**	**118 261**	**37**	**10 629**	**3**	**77 017**	**24**	**22 893**	**7**	**74 666**	**24**	**1 708**	**1**	**11 961**	**4**

7.3 Bucket and chemical toilets in Limpopo

Are bucket toilets still in use?

Bucket toilets should have already been eradicated in South Africa. Yet, as of 2023, there are still more than 8 000 households in Limpopo using bucket toilets (DWS, 2023b), as illustrated in Figure 7-4.

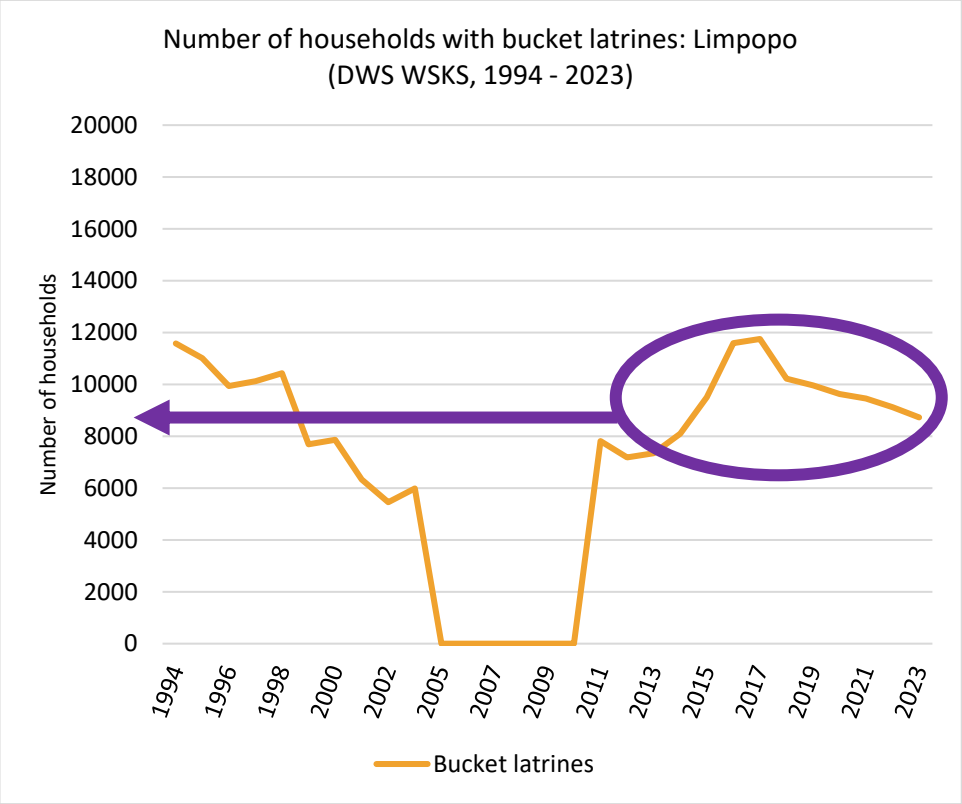


FIGURE 7-4: NUMBER OF HOUSEHOLDS WITH BUCKET LATRINES IN LIMPOPO FROM 1994 TO 2023

Are chemical toilets an issue?

Currently, more than 83 000 households in Limpopo are served by chemical toilets (DWS, 2023b), as illustrated in Figure 7-5. Can the province afford this?

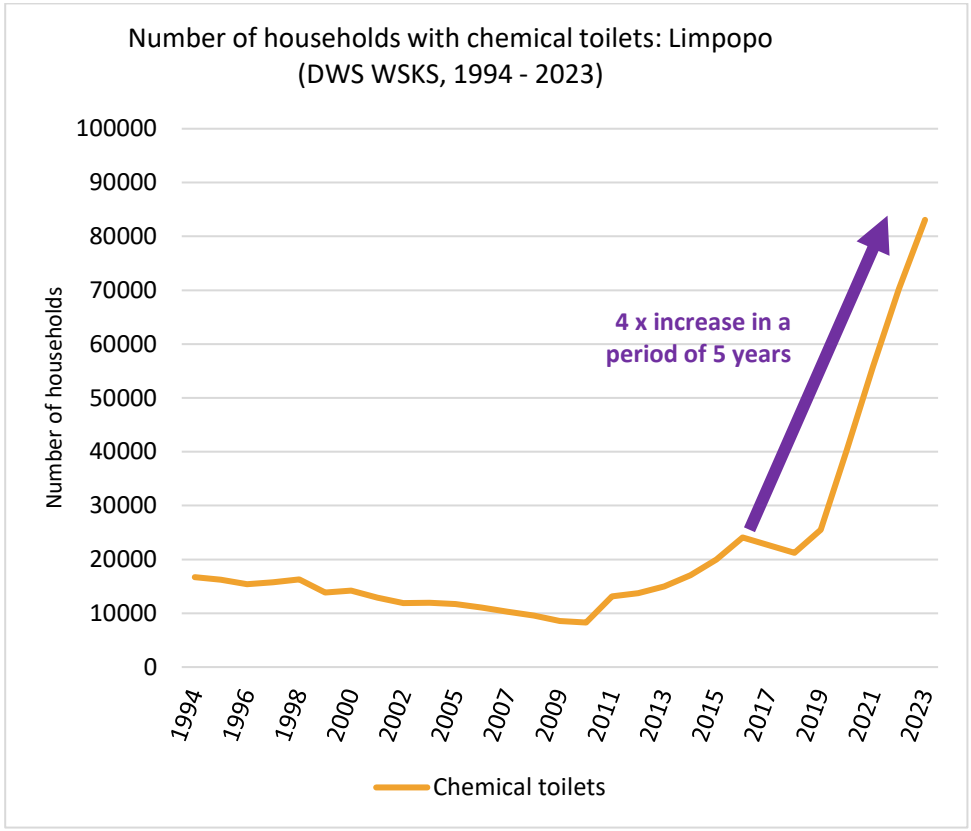


FIGURE 7-5: NUMBER OF HOUSEHOLDS WITH CHEMICAL TOILETS IN LIMPOPO FROM 1994 TO 2023

Assuming 2.5 households are served per chemical toilet (i.e. ~10 people per toilet, ~33 200 chemical toilets in operation), and chemical toilet rental costs of R750/month, this equates to a cost of **~R25 million/month** or **~R299 million/year**.

Could innovative sanitation alternatives meet the same needs (or perform even better) at a lower cost?

7.4 Progress on eradicating sanitation backlog

Is Limpopo on target to eradicate sanitation backlogs?

Almost all WSAs in Limpopo have significant overall backlog (i.e. inappropriate sanitation systems and no sanitation systems). Bela-Bela is the only WSA with relatively low sanitation backlog (7%). Figure 7-6 shows the percentage of appropriate, inappropriate and unacceptable sanitation for each WSA in Limpopo, as well as the overall statistics for the province.

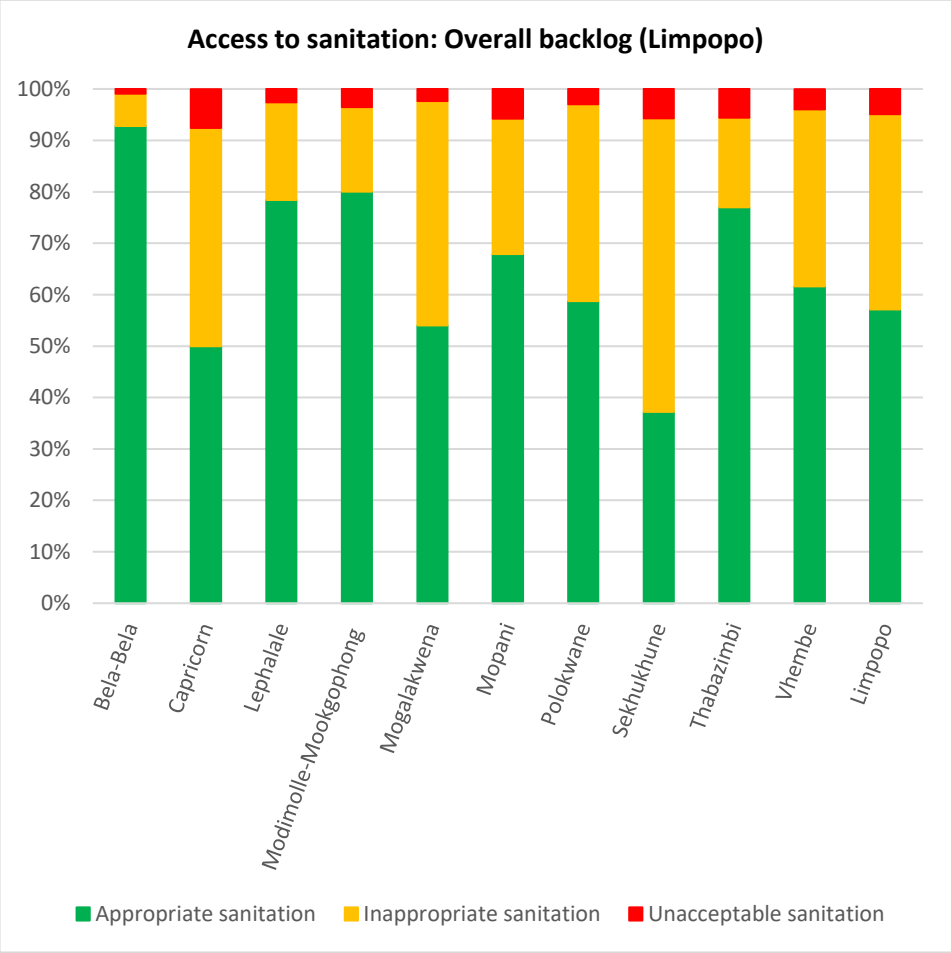


FIGURE 7-6: ACCESS TO SANITATION AND OVERALL BACKLOG IN LIMPOPO

TABLE 7-2: RATE OF SANITATION DELIVERY AND LIKELIHOOD OF WSAS IN LIMPOPO TO ACHIEVE BACKLOG ERADICATION

Rate of delivery (years to eradicate backlog) (as of 2021)	End date	Years to achieve
Bela-Bela	2023	1
Capricorn	2045	24
Lephalale	2035	13
Modimolle/Mookgophong	2032	10
Mogalakwena	2038	16
Mopani	2085	64
Polokwane	2037	16
Sekhukhune	2036	15
Thabazimbi	2050	28
Vhembe	2083	62

NOTE: The figures above were calculated in 2021. Has there been progress since then? Has the rate of sanitation service delivery (i) increased, (ii) stayed the same, or (iii) decreased? Understanding (a) sanitation backlog and (b) the rate of sanitation service delivery will help to determine if WSAs are on track to meet sanitation access-related SDGs.

From Table 7-2 above:

- 1 WSA has a good chance of eradicating their backlog by 2030 (green).
- 1 WSA is likely to make progress but to eradicate backlogs only partially (yellow).
- 8 WSAs are not addressing their backlogs quickly enough and are unlikely to achieve backlog eradication.

7.5 Municipal sanitation status: Limpopo

Where is Limpopo doing well?

Although access to sanitation has improved since 1994, the status of containment, emptying and transport and treatment has been categorised as 'poor' for the Limpopo province. The status of disposal and reuse has also been categorised as 'poor' for the Limpopo province. All components of the sanitation service chain are therefore categorised as 'poor'. It is not surprising that institutional aspects are also far from ideal. There appears to be little innovation or value add related to the sanitation sector in the province. Challenges are compounded by growing informal settlements. Unfortunately, there is much work to do to improve sanitation in the province.

water & sanitation
Department: Water and Sanitation
REPUBLIC OF SOUTH AFRICA

National Sanitation Integrated Plan

Provincial Status Report
Limpopo

Provincial Status: Poor

National Status

Total Provinces
9

			Data Set (*indicates number of WSAs with data submitted*)
Context			
Population (DWS WSKS) (April 2023)	5920960		10 / 10
Number of households (DWS WSKS) (April 2023)	1602607 HH		10 / 10
Number of wastewater treatment works	64		10 / 10
Number of sewer pump stations	137		10 / 10
Length of sewer pipelines	NI km		0 / 10
Containment		**Poor**	
1.1 No sanitation (backlog) (DWS WSKS) (April 2023)	5 % HH	Average	10 / 10
1.2 Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)	43 % HH	Poor	10 / 10
1.3 Average rate of sanitation delivery (years to eradicate backlog)	25 years	Poor	10 / 10
Emptying and Transport		**Poor**	
2.1 Sewer network condition	NI		0 / 10
2.2 Pit toilet emptying	40 % of WSAs	Poor	9 / 10
2.3 Vacuum truck / honeysucker needs	20 trucks	Poor	6 / 10
2.4 Vacuum truck / honeysucker condition	30 % in fair condition	Poor	6 / 10
Treatment		**Poor**	
3.1 % of wastewater treatment works design capacity utilised	42 %	Average	8 / 10
3.1.1 Design capacity	213.1 Ml/d		10 / 10
3.1.2 Available capacity	143.5 Ml/d		10 / 10
3.1.3 Operational capacity	92.5 Ml/d		8 / 10
3.2 Wastewater treatment works effluent quality	14 % compliance	Poor	10 / 10
3.2.1 Microbiological compliance	10 %		10 / 10
3.2.2 Chemical compliance	12 %		10 / 10
3.2.3 Physical compliance	20 %		10 / 10
3.3 Wastewater treatment works staffing shortfall	55 %	Poor	10 / 10
3.3.1 Number of supervisor(s): Compliant	16		10 / 10
3.3.2 Number of supervisor(s): Shortfall	17		10 / 10
3.3.3 Number of PC(s): Compliant	62		10 / 10
3.3.4 Number of PC(s): Shortfall	79		10 / 10
Disposal and Reuse		**Poor**	
4.1 Analysis and classification of wastewater sludge	30 % of WSAs	Poor	8 / 10
4.2 Wastewater sludge management	30 % acceptable practices		8 / 10
4.3 Analysis and classification of faecal sludge	40 % of WSAs	Average	9 / 10
4.4 Faecal sludge management	90 % acceptable practices		9 / 10
4.5 Treated wastewater effluent reuse	20 % of WSAs	Poor	9 / 10
Institutional Aspects		**Poor**	
5.1 Green Drop performance (2021)	29 %	Poor	10 / 10
5.2 Sanitation staff vacancies	35 %	Poor	9 / 10
5.3 Sanitation business financial status	50 % of WSAs operate a deficit	Poor	6 / 10
5.4 Growing informal settlements	20 % of WSAs		4 / 10
5.5 Shit-flow diagrams developed for sanitation systems	10 % of WSAs		7 / 10
5.6 Alternative/innovative sanitation processes or technologies implemented	30 % of WSAs have implement multiple		10 / 10
5.6.1 Toilets	*20* % of WSAs		9 / 10
5.6.2 Emptying	*20* % of WSAs		9 / 10
5.6.3 Transport	*20* % of WSAs		9 / 10
5.6.4 Treatment	*50* % of WSAs		9 / 10
5.6.5 Disposal benefication	*0* % of WSAs		7 / 10
5.6.6 New business models	*20* % of WSAs		6 / 10

FIGURE 7-7: SANITATION STATUS IN LIMPOPO

7.6 1st order excreta flow diagram (SFD): Limpopo

What are some of the contributors to poor sanitation performance?

The 1st order SFD for Limpopo (Figure 7-8) highlights significant gaps in the sanitation service chain. These deficiencies all potentially have a negative impact on communities (e.g. water supply) and the environment (e.g. water sources).

Containment:

- Inappropriately constructed on-site sanitation systems

Emptying and transport:

- Lost sewage due to old and leaking pipes
- Inadequate maintenance and servicing of basic sanitation systems (e.g. not emptied)
- Lack of control of transportation of FS (no monitoring or management)

Treatment:

- Poorly operated, maintained and managed WWTWs resulting in poor performance or non-compliance

End-use or disposal:

- Inadequate sludge analysis and classification, and resultant inappropriate sludge disposal and/or non-beneficial use

Institutional:

- Additional funding required for sanitation systems or programme

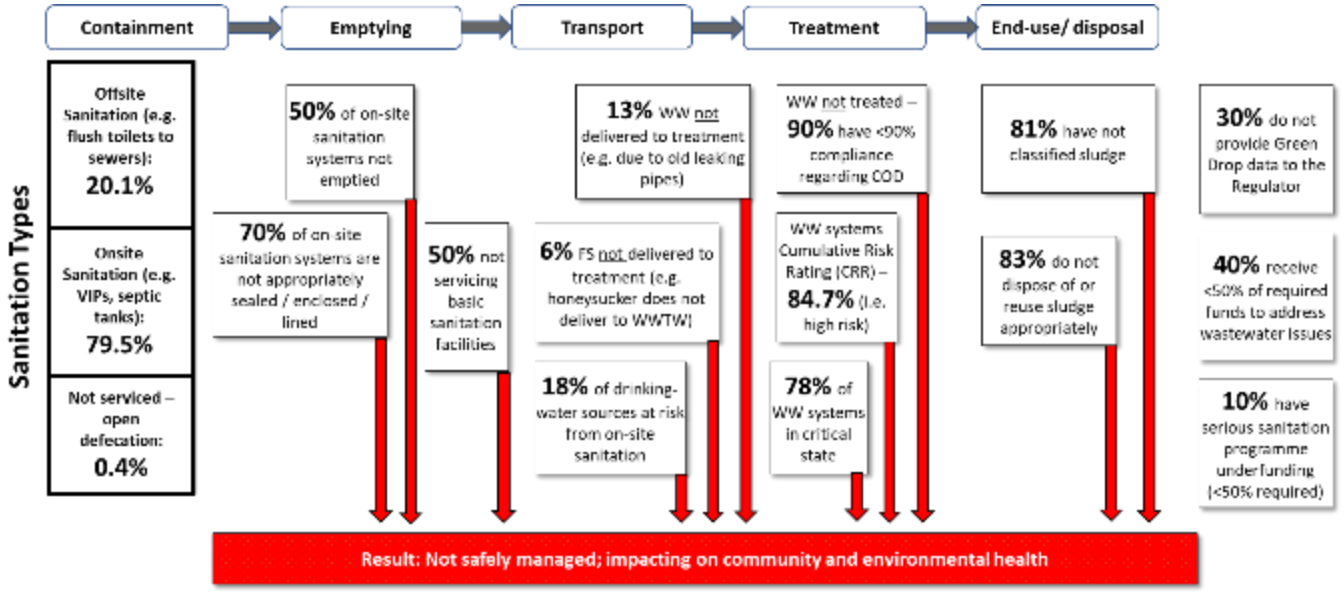


FIGURE 7-8: 1ST ORDER SFD: LIMPOPO

7.7 Sanitation status along the service chain

An analysis of the sanitation service chain shows there is much work to do

A total of 15 indicators were selected and analysed to assess the status of the sanitation service chain, focusing on the quality of available data. This includes three indicators for each of the four service chain components, plus three additional indicators addressing institutional aspects. The analysis results for Limpopo, obtained from the situational analysis tool developed as part of the NSIP Project, are presented visually in Figure 7-9 to Figure 7-11. The colour coding used in the analysis indicates effectiveness levels based on predefined scoring criteria. Green signifies that systems are functioning well and meeting expectations, while amber indicates average performance with identified areas for improvement. In contrast, red highlights poor performance or significant issues that require immediate attention (refer to Appendix B of the Monitoring Framework and Guide for detailed scoring rules). The visual representation in Figure 7-9 provides a comprehensive overview of the sanitation status along the service chain for all provinces in the country, allowing for quick and easy assessment at a glance.

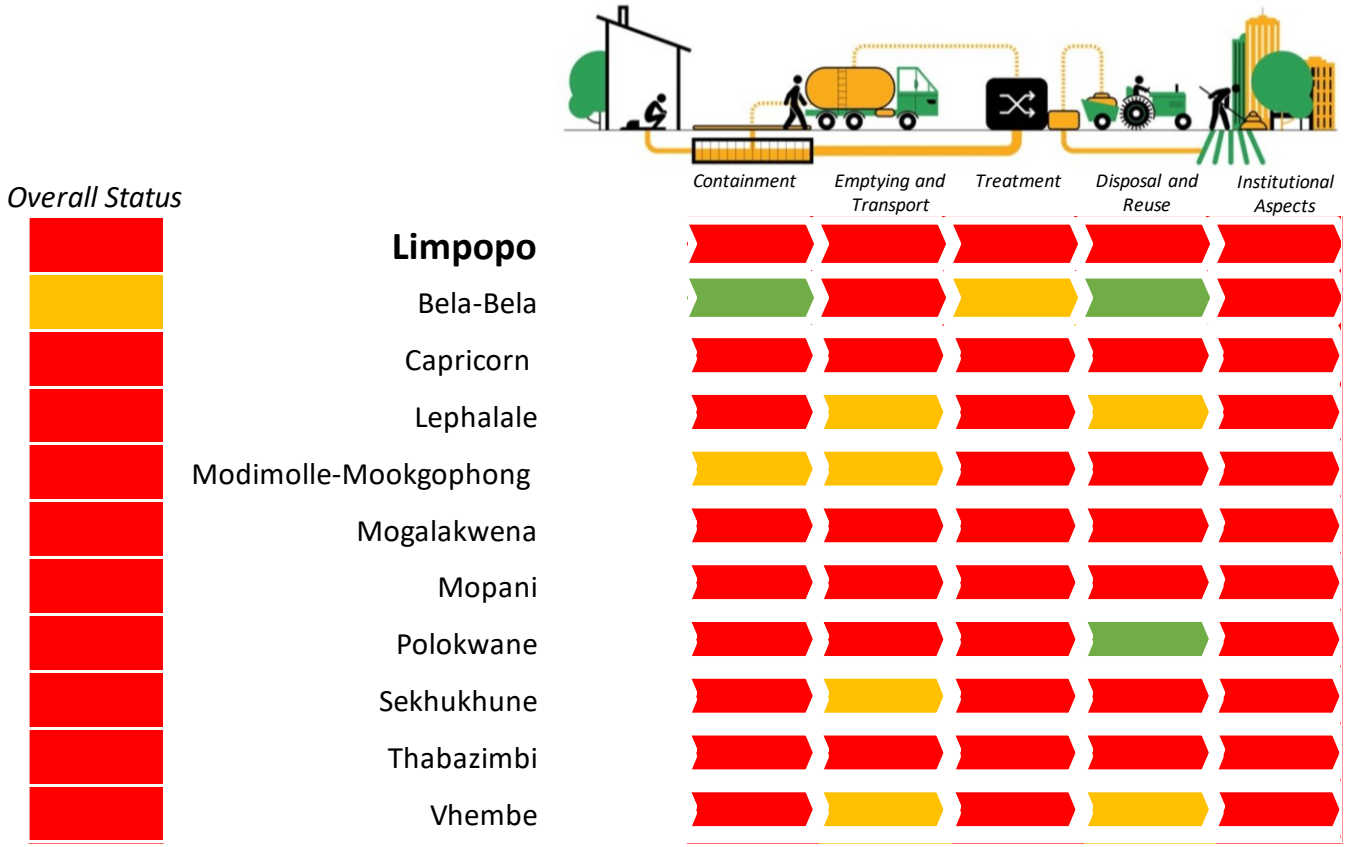


FIGURE 7-9: OVERVIEW OF SANITATION STATUS ALONG THE SERVICE CHAIN FOR WSAS IN LIMPOPO

Overall score	
>75%	Good
50%-75%	Average
<50%	Poor

- The performance of Limpopo and most WSAs falls short of the desired standard, with just one WSA (Bela-Bela) achieving an 'average' overall status.
- Significant efforts are needed to enhance sanitation in Limpopo, as the health of the sanitation service chain is far from ideal. Across most WSAs, all components are categorised as 'poor', with only small pockets showing average performance.
- Specifically, there is just one instance (Bela-Bela) of good performance observed in containment practices, while two instances (Bela-Bela and Polokwane) are noted in disposal and reuse efforts.

7.7.1 Heat map: Limpopo

The heat map further highlights key deficiencies in the sanitation service chain

The results of the analysis of the 15 indicators are represented for all the WSAs in Limpopo in the heat map in Figure 7-10. Green signifies that systems are functioning well and meeting the expectations defined by the scoring criteria. Amber indicates average performance, suggesting areas that require improvement, while red highlights poor performance or significant issues that demand immediate attention. Although there are pockets of good performance, overall, the performance is far from ideal

Indicator #	Limpopo	Bela-Bela	Capricorn	Lephalale	Modimolle-Mookgophong	Mogalakwena	Mopani	Polokwane	Sekhukhune	Thabazimbi	Vhembe
	Overall sanitation status										
	Containment										
1	No sanitation (backlog) (DWS WSKS) (April 2023)										
2	Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)										
3	Rate of sanitation delivery (backlog eradication)										
	Emptying and Transport										
4	Pit toilet emptying										
5	Vacuum truck / honeysucker needs										
6	Vacuum truck / honeysucker condition										
	Treatment										
7	WWTW design capacity utilised										
8	WWTW effluent quality										
9	WWTW staffing shortfall										
	Disposal and Reuse										
10	Analysis and classification of wastewater sludge Wastewater sludge management										
11	Analysis and classification of faecal sludge Faecal sludge management										
12	Treated wastewater effluent reuse										
	Institutional Aspects										
13	Green Drop performance										
14	Sanitation staff vacancies										
15	Sanitation business financial status										

Green – Good | Amber – Average | Red – Poor

FIGURE 7-10: HEAT MAP SHOWING THE STATUS OF THE 15 INDICATORS FOR WSAS IN LIMPOPO

7.7.2 Rating WSAs in Limpopo: Sanitation service chain elements

The performance of each of the 15 indicators of the sanitation service chain highlights key deficiencies at WSAs

Using the heat map and total scores of the 15 indicators, each WSA in Limpopo is ranked from poorest-performing on the left to best-performing on the right, as shown in Figure 7-11. WSAs facing significant challenges across the sanitation service chain, including related institutional factors, are marked mostly in red, starting on the far left, while those that are performing well are indicated mostly in green, moving towards the far right.

The 15 sanitation service chain elements that are rated are indicated below:

	Containment
1.	No sanitation (backlog)
2.	Inappropriate sanitation (backlog)
3.	Rate of sanitation delivery (years to eradicate backlog)
	Emptying and transport
4.	Pit toilet emptying
5.	Vacuum truck/honeysucker needs
6.	Vacuum truck/honeysucker condition
	Treatment
7.	WWTW design capacity utilised
8.	WWTW effluent quality
9.	WWTW staffing shortfall
	Disposal and reuse
10.	Analysis and classification of wastewater sludge
	Wastewater sludge management
11.	Analysis and classification of FS
	FSM
12.	Treated wastewater effluent reuse
	Institutional aspects
13.	Green Drop performance (2021)
14.	Sanitation staff vacancies
15.	Sanitation business financial status

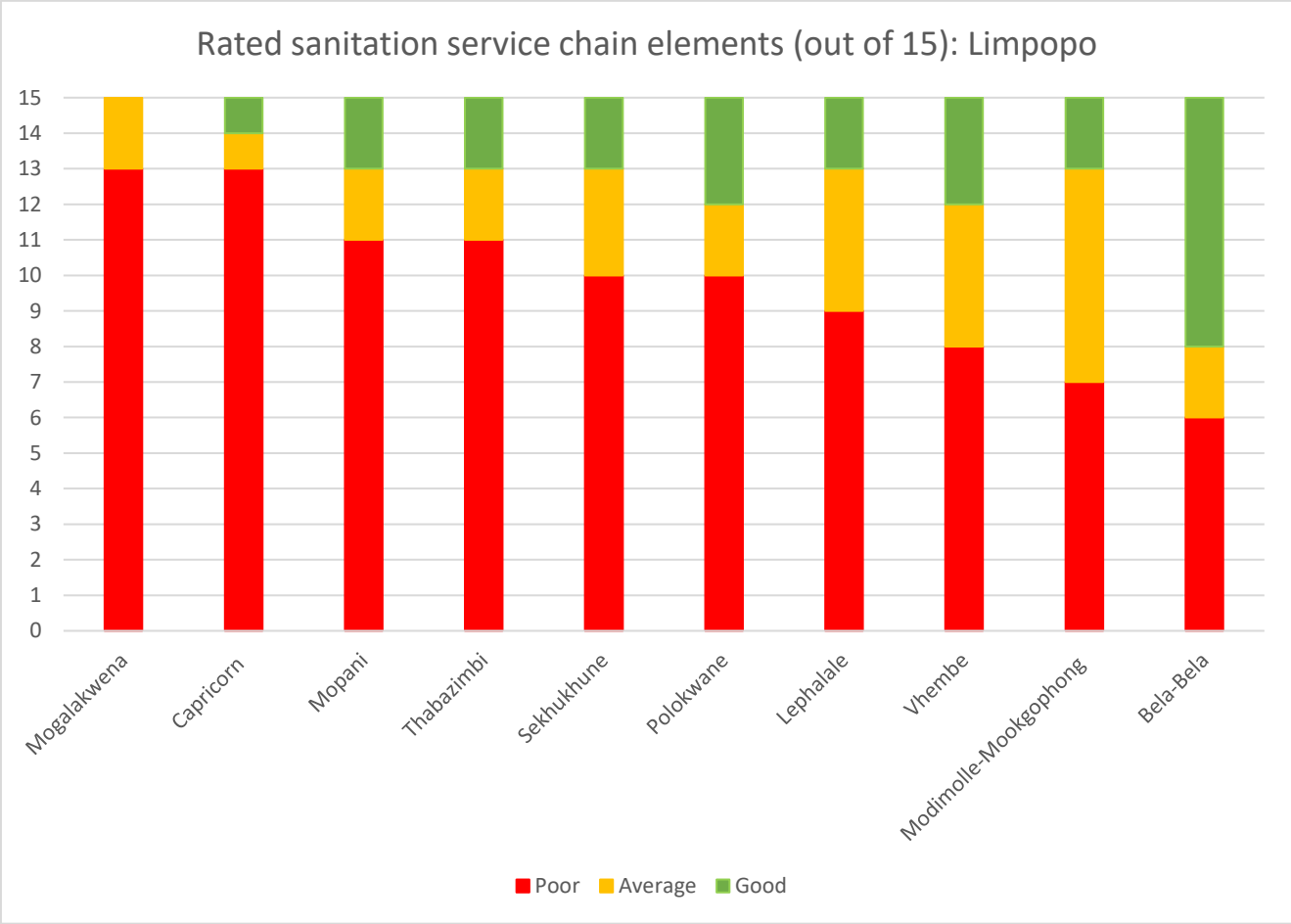


FIGURE 7-11: RATED WSAS IN LIMPOPO BASED ON THE PERFORMANCE OF THE 15 INDICATORS (LEFTMOST COLUMN = POOREST PERFORMER; RIGHTMOST COLUMN = BEST PERFORMER)

7.8 Key findings: Limpopo

Is Limpopo's sanitation in good health?

The analysis below provides a snapshot of Limpopo's sanitation status as of 2022/23.

Overall

The sanitation status of the province can be categorised as 'poor'.

Access to sanitation/Containment

Limpopo has a predominantly rural population, with 80% of households located in rural areas. The province relies heavily on on-site sanitation, with 74% of households using on-site sanitation systems. Only 21% of households in Limpopo are connected to the sewer system, and 5% have no access to sanitation facilities. In rural areas, 17% of households have sewer connections, while 78% use on-site sanitation. A similar trend is observed in the urban areas, with 37% of households connected to the sewer network and 59% relying on on-site sanitation systems.

Bucket and chemical toilets

Although the use of bucket toilets has declined between 2017 and 2023, as of 2023, over 8 700 households in the province continue to rely on bucket toilets. In contrast, the number of households using chemical toilets has rapidly increased since 2018, with more than 83 000 households served by chemical toilets as of 2023 (DWS, 2023b). The continued use of bucket toilets and the increasing reliance on chemical toilets contribute to the ongoing 'inappropriate sanitation' backlog across WSAs in the province. These types of sanitation solutions, while providing a temporary alternative, do not meet the standards of more permanent and hygienic sanitation infrastructure.

Sanitation backlog

One WSA (Bela-Bela) could potentially meet sector targets by 2030 (e.g. SDG 6.2). Four WSAs (Capricorn, Mopani, Sekhukhune, Thabazimbi) have a 'no service' backlog exceeding 5%, which is categorised as 'poor'. Eight WSAs (Capricorn, Lephalale, Mogalakwena, Mopani, Polokwane, Sekhukhune, Thabazimbi, Vhembe) have an 'inappropriate sanitation' backlog exceeding 20%, also categorised as 'poor'.

Given the current rate of sanitation delivery (years to eradicate backlog), it is highly unlikely that eight WSAs (Capricorn, Lephalale, Mogalakwena, Mopani, Polokwane, Sekhukhune, Thabazimbi, Vhembe) will eradicate their backlog by 2030.

Emptying and transport

Six WSAs (Bela-Bela, Capricorn, Mogalakwena, Mopani, Thabazimbi, Vhembe) indicated that they do not empty pits. This means that users need to empty their own pits, dig their own new pits, or resort to other means. WSAs need to ensure that users are aware of appropriate safety and hygiene measures to follow.

Six WSAs (Bela-Bela, Capricorn, Mogalakwena, Mopani, Polokwane, Sekhukhune) indicated that they have a significant shortage of vacuum trucks and honeysuckers with their need exceeding 100% of their current fleet (i.e. they need to at least double their fleet). This result also seems to indicate that pit-emptying could currently be limited by the number of vacuum trucks and honeysuckers available.

Furthermore, the condition of most of the existing vacuum trucks and honeysuckers is far from ideal, with five WSAs (Bela-Bela, Capricorn, Modimolle-Mookgophong, Mogalakwena, Polokwane) indicating that they are in poor condition. This implies that breakdowns are inevitable and indicates a further vulnerability in emptying and transport.

Treatment

Three WSAs (Lephalale, Modimolle-Mookgophong, Polokwane) have WWTWs where the design capacity exceeds 90% utilisation. This implies that the capacity of the WWTWs at the remaining WSAs should be sufficient to treat incoming flows.

Despite the spare treatment capacity, the WWTWs performance of nine (i.e. almost all) WSAs (Capricorn, Lephalale, Modimolle-Mookgophong, Mogalakwena, Mopani, Polokwane, Sekhukhune, Thabazimbi, Vhembe) is not ideal, with a treated effluent quality with an overall compliance of less than 50%.

Most WSAs indicated a significant challenge with WWTW staffing, with eight WSAs (Capricorn, Lephalale, Mogalakwena, Mopani, Polokwane, Sekhukhune, Thabazimbi, Vhembe) indicating an overall WWTW staffing shortfall greater than 35%. This could contribute to the noted performance challenges.

Disposal and reuse

Five WSAs (Capricorn, Modimolle-Mookgophong, Mogalakwena, Mopani, Thabazimbi) scored poorly for wastewater sludge management as they do not analyse and classify their wastewater sludge and/or do not proactively manage their sludge end-use or disposal.

Only one WSA (Mogalakwena) scored poorly for FSM as they do not analyse and classify their FS and/or do not proactively manage their FS end-use or disposal.

Eight WSAs (Capricorn, Lephalale, Modimolle-Mookgophong, Mogalakwena, Mopani, Sekhukhune, Thabazimbi, Vhembe) do not reuse treated wastewater effluent for any purpose. This lack of reuse could be because of the poor quality of treated effluent.

Institutional aspects

All 10 WSAs do not perform well in Green Drop, with all WSAs (Bela-Bela, Capricorn, Lephalale, Modimolle-Mookgophong, Mogalakwena, Mopani, Polokwane, Sekhukhune, Thabazimbi, Vhembe) having a very poor Green Drop performance score of less than 50%.

Eight WSAs (Bela-Bela, Capricorn, Lephalale, Mogalakwena, Mopani, Polokwane, Sekhukhune, Thabazimbi) have significant sanitation staff challenges with sanitation staff vacancies of more than 35%.

Nine (i.e. almost all) WSAs (Bela-Bela, Capricorn, Lephalale, Modimolle-Mookgophong, Mogalakwena, Polokwane, Sekhukhune, Thabazimbi, Vhembe) indicated that the financial status of their sanitation business is far from ideal and is running at a deficit.

Photo: Eliobed Suarez on Unsplash

8 Situational analysis: Mpumalanga

Section 8 provides a summary of data and findings from the **Mpumalanga Situational Analysis** report.

For access to the full report, scan the QR code above.

What is the current reality in the province?

8.1 Mpumalanga overview

Water services authorities

WSAs are responsible for supplying both water and sanitation services to households in their area of jurisdiction. In Mpumalanga, there are:

- 3 district municipalities
- 17 local municipalities
- 17 WSAs

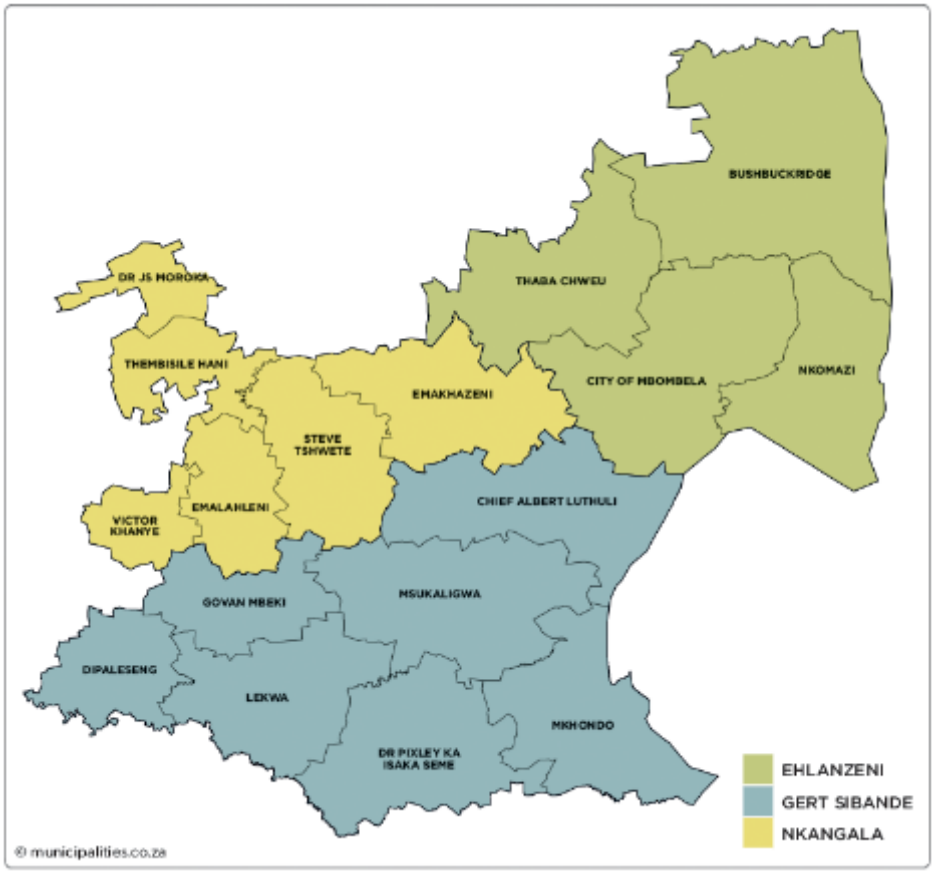


FIGURE 8-1: MUNICIPALITIES AND WSAS IN MPUMALANGA

District municipalities
Ehlanzeni
Gert Sibande
Nkangala

Local municipalities	
Bushbuckridge*	Mkhondo*
City of Mbombela*	Msukaligwa*
Nkomazi*	Dr JS Moroka*
Thaba Chweu*	Emakhazeni*
Chief Albert Luthuli*	Emalahleni*
Dipaleseng*	Steve Tshwete*
Dr Pixley Ka Isaka Seme*	Thembisile Hani*
Govan Mbeki*	Victor Khanye*
Lekwa*	

(* indicates WSA)

8.2 Access to sanitation: Households

Sanitation service levels per household: A provincial view

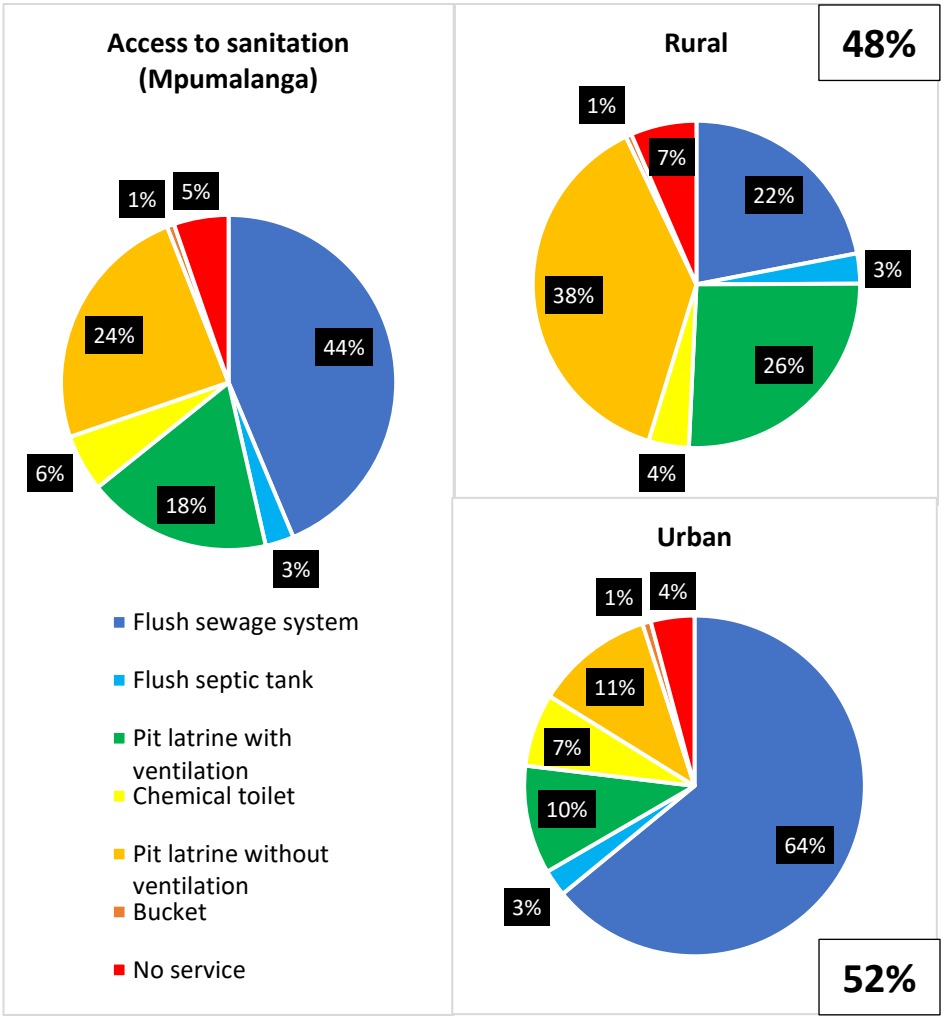


FIGURE 8-2: SANITATION SERVICE LEVELS PER HOUSEHOLD IN MPUMALANGA

An analysis of sanitation provision by settlement type (see Figure 8-2 and Table 8-2) depicts a total number of 1 506 471 households in Mpumalanga, of which 729 124 (48%) are rural settlements and 777 347 (52%) urban settlements (DWS, 2022b).

The data shows that provincially:

- **44%** of households have access to a flush toilet connected to the sewage system.
- **5%** of households do not have access to sanitation (implying open defecation).
- The remaining **51%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (18%), chemical toilets (6%), pit latrines without ventilation (24%) and bucket latrines (1%).

In rural settlements:

- **22%** of households have access to a flush toilet connected to the sewage system.
- **7%** of households do not have access to sanitation (implying open defecation).
- The remaining **71%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (26%), chemical toilets (4%), pit latrines without ventilation (38%) and bucket latrines (1%).

In urban settlements:

- **64%** of households have access to a flush toilet connected to the sewage system.
- **4%** of households do not have access to sanitation (implying open defecation).
- The remaining **32%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (10%), chemical toilets (7%), pit latrines without ventilation (11%) and bucket latrines (1%).

The analysis of sanitation provision by settlement type at the WSA level in Mpumalanga is depicted in Figure 8-3 and detailed in Table 8-1 and Table 8-2.

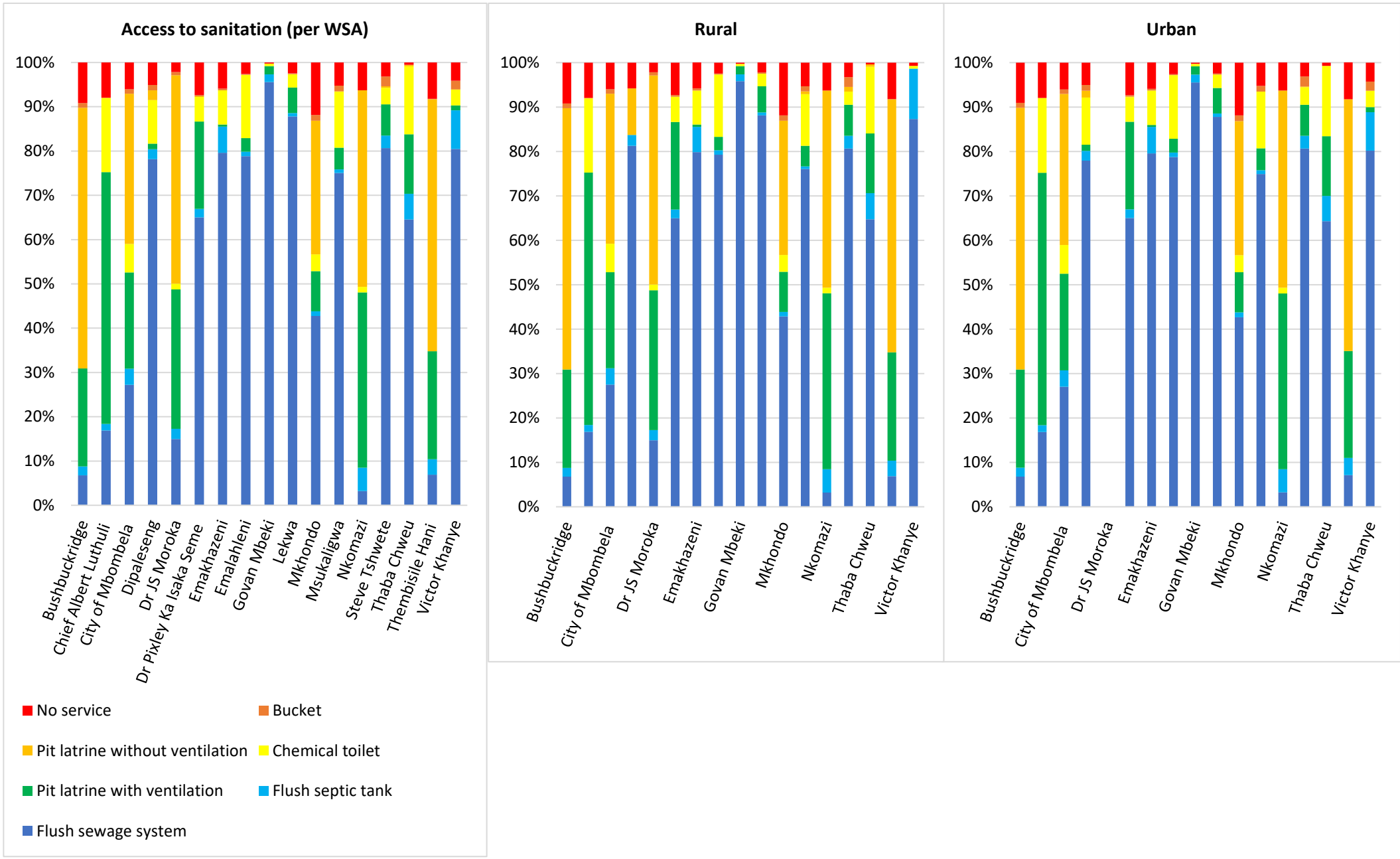


FIGURE 8-3: SANITATION SERVICE LEVELS PER HOUSEHOLD IN 17 WSAS IN MPUMALANGA

TABLE 8-1: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN MPUMALANGA (1)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Bushbuckridge	189 314		12 836	7	3 791	2	41 861	22	0	0	111 477	59	1 993	1	17 348	9
Rural	172 387	91	11 687	7	3 448	2	38 121	22	0	0	101 497	59	1 812	1	15 814	9
Urban	16 927	9	1 149	7	343	2	3 740	22	0	0	9 980	59	181	1	1 534	9
Chief Albert Luthuli	61 907		10 445	17	943	2	35 191	57	10 364	17	30	0	0	0	4 939	8
Rural	54 478	88	9 193	17	831	2	30 969	57	9 112	17	30	0	0	0	4 347	8
Urban	7 429	12	1 252	17	112	2	4 222	57	1 252	17	0	0	0	0	592	8
City of Mbombela	280 733		76 402	27	10 269	4	61 034	22	18 037	6	95 243	34	2 827	1	16 922	6
Rural	96 978	35	26 693	28	3 557	4	20 972	22	6 209	6	32 767	34	954	1	5 830	6
Urban	183 755	65	49 709	27	6 712	4	40 062	22	11 828	6	62 476	34	1 873	1	11 092	6
Dipaleseng	17 222		13 465	78	382	2	220	1	1 690	10	382	2	204	1	878	5
Rural	1 364	8	1 109	81	33	2	0	0	0	0	143	10	0	0	79	6
Urban	15 858	92	12 356	78	349	2	220	1	1 690	11	239	2	204	1	799	5
Dr JS Moroka	72 191		10 804	15	1 660	2	22 720	31	939	1	33 996	47	512	1	1 566	2
Rural	72 191	100	10 804	15	1 660	2	22 720	31	939	1	33 996	47	512	1	1 566	2
Urban	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dr Pixley Ka Isaka Seme	26 102		16 967	65	511	2	5 143	20	1 456	6	38	0	78	0	1 912	7
Rural	3 072	12	1 996	65	60	2	605	20	176	6	0	0	11	0	224	7
Urban	23 030	88	14 971	65	451	2	4 538	20	1 280	6	38	0	67	0	1 688	7
Emakhazeni	16 218		12 912	80	960	6	71	0	1 256	8	0	0	66	0	957	6
Rural	2 573	16	2 055	80	146	6	14	1	197	8	0	0	12	0	150	6
Urban	13 645	84	10 857	80	814	6	57	0	1 059	8	0	0	54	0	807	6
Emalahleni	174 123		137 280	79	1 785	1	5 351	3	24 822	14	79	0	339	0	4 459	3
Rural	34 973	20	27 717	79	352	1	1 055	3	4 902	14	26	0	60	0	850	2
Urban	139 150	80	109 563	79	1 433	1	4 296	3	19 920	14	53	0	279	0	3 609	3
Govan Mbeki	126 066		120 492	96	2 190	2	2 374	2	649	1	0	0	46	0	313	0
Rural	7 686	6	7 364	96	120	2	142	2	37	0	0	0	4	0	18	0
Urban	118 380	94	113 128	96	2 070	2	2 232	2	612	1	0	0	42	0	295	0

TABLE 8-2: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN MPUMALANGA (2)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Lekwa	43 221		37 955	88	329	1	2 495	6	1 278	3	25	0	93	0	1 043	2
Rural	4 609	11	4 061	88	32	1	270	6	131	3	0	0	13	0	103	2
Urban	38 612	89	33 894	88	297	1	2 225	6	1 147	3	25	0	80	0	940	2
Mkhondo	52 777		22 565	43	555	1	4 782	9	2 005	4	15 940	30	668	1	6 262	12
Rural	23 986	45	10 277	43	245	1	2 169	9	910	4	7 245	30	291	1	2 851	12
Urban	28 791	55	12 288	43	310	1	2 613	9	1 095	4	8 695	30	377	1	3 411	12
Msukaligwa	59 144		44 382	75	478	1	2 900	5	7 488	13	35	0	774	1	3 084	5
Rural	5 643	10	4 293	76	32	1	261	5	657	12	35	1	64	1	300	5
Urban	53 501	90	40 089	75	446	1	2 639	5	6 831	13	0	0	710	1	2 784	5
Nkomazi	120 354		3 893	3	6 319	5	47 629	40	1 545	1	53 401	44	0	0	7 581	6
Rural	108 442	90	3 506	3	5 697	5	42 914	40	1 393	1	48 113	44	0	0	6 830	6
Urban	11 912	10	387	3	622	5	4 715	40	152	1	5 288	44	0	0	751	6
Steve Tshwete	100 388		80 957	81	2 884	3	7 047	7	3 756	4	359	0	2 208	2	3 175	3
Rural	18 852	19	15 202	81	543	3	1 321	7	556	3	204	1	412	2	612	3
Urban	81 536	81	65 755	81	2 341	3	5 726	7	3 200	4	155	0	1 796	2	2 563	3
Thaba Chweu	42 844		27 662	65	2 484	6	5 759	13	6 574	15	134	0	0	0	231	1
Rural	25 652	60	16 609	65	1 503	6	3 448	13	3 855	15	134	1	0	0	104	0
Urban	17 192	40	11 053	64	981	6	2 311	13	2 719	16	0	0	0	0	127	1
Thembisile Hani	95 779		6 601	7	3 350	3	23 360	24	0	0	54 526	57	98	0	7 844	8
Rural	95 135	99	6 555	7	3 325	3	23 205	24	0	0	54 161	57	98	0	7 790	8
Urban	644	1	46	7	25	4	155	24	0	0	365	57	0	0	54	8
Victor Khanye	28 088		22 600	80	2 463	9	305	1	1 009	4	0	0	547	2	1 165	4
Rural	1 103	4	963	87	125	11	0	0	7	1	0	0	0	0	8	1
Urban	26 985	96	21 637	80	2 338	9	305	1	1 002	4	0	0	547	2	1 157	4
Mpumalanga	**1 506 471**		**658 218**	**44**	**41 353**	**3**	**268 242**	**18**	**82 868**	**6**	**365 665**	**24**	**10 453**	**1**	**79 679**	**5**
Rural	**729 124**	**48**	**160 084**	**22**	**21 709**	**3**	**188 186**	**26**	**29 081**	**4**	**278 351**	**38**	**4 243**	**1**	**47 476**	**7**
Urban	**777 347**	**52**	**498 134**	**64**	**19 644**	**3**	**80 056**	**10**	**53 787**	**7**	**87 314**	**11**	**6 210**	**1**	**32 203**	**4**

8.3 Bucket and chemical toilets in Mpumalanga

Are bucket toilets still in use?

Bucket toilets should have already been eradicated in South Africa. Yet, as of 2023, there are still more than 10 000 households in Mpumalanga using bucket toilets (DWS, 2023b), as illustrated in Figure 8-4.

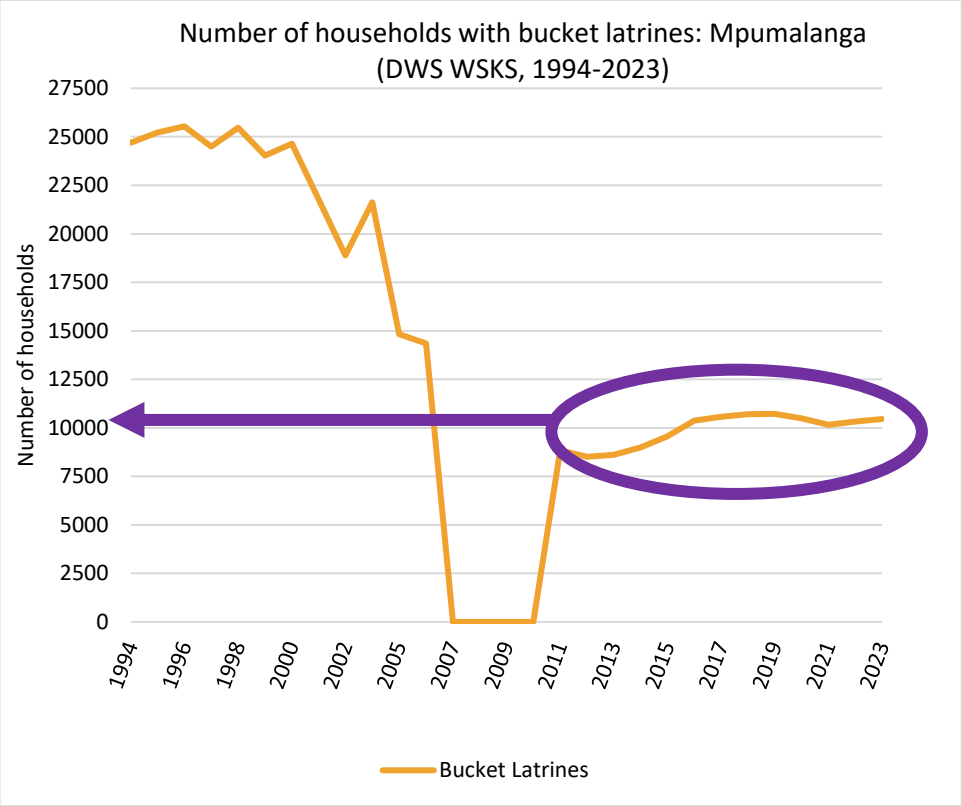


FIGURE 8-4: NUMBER OF HOUSEHOLDS WITH BUCKET LATRINES IN MPUMALANGA FROM 1994 TO 2023

Are chemical toilets an issue?

Currently, more than 82 000 households in Mpumalanga are served by chemical toilets (DWS, 2023b), as illustrated in Figure 8-5. Can the province afford this?

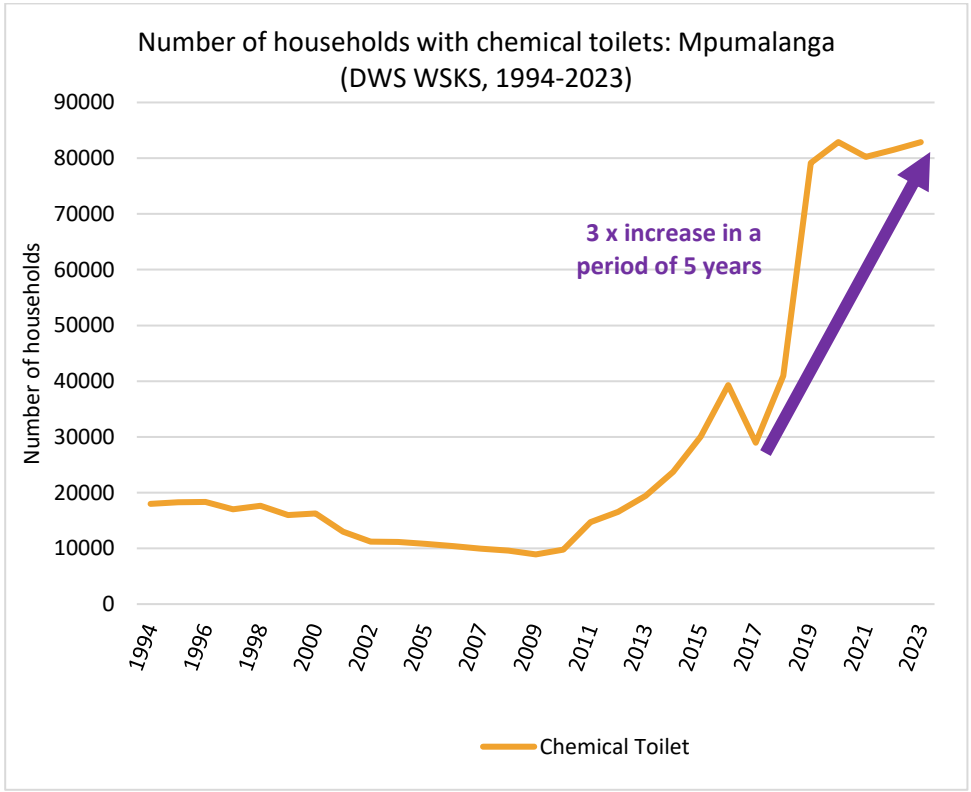


FIGURE 8-5: NUMBER OF HOUSEHOLDS WITH CHEMICAL TOILETS IN MPUMALANGA FROM 1994 TO 2023

Assuming 2.5 households are served per chemical toilet (i.e. ~10 people per toilet, ~32 800 chemical toilets in operation), and chemical toilet rental costs of R750/month, this equates to a cost of **~R25 million/month** or **~R295 million/year**.

Could innovative sanitation alternatives meet the same needs (or perform even better) at a lower cost?

8.4 Progress on eradicating sanitation backlog

Is Mpumalanga on target to eradicate sanitation backlogs?

Almost all WSAs in Mpumalanga have significant overall backlog (i.e. inappropriate sanitation systems and no sanitation systems). Govan Mbeki, Lekwa and Steve Tshwete are the only WSAs with relatively low sanitation backlogs (1%, 6% and 9% respectively). Figure 8-6 shows the percentage of appropriate, inappropriate and unacceptable sanitation for each WSA in Mpumalanga, as well as the overall statistics for the province.

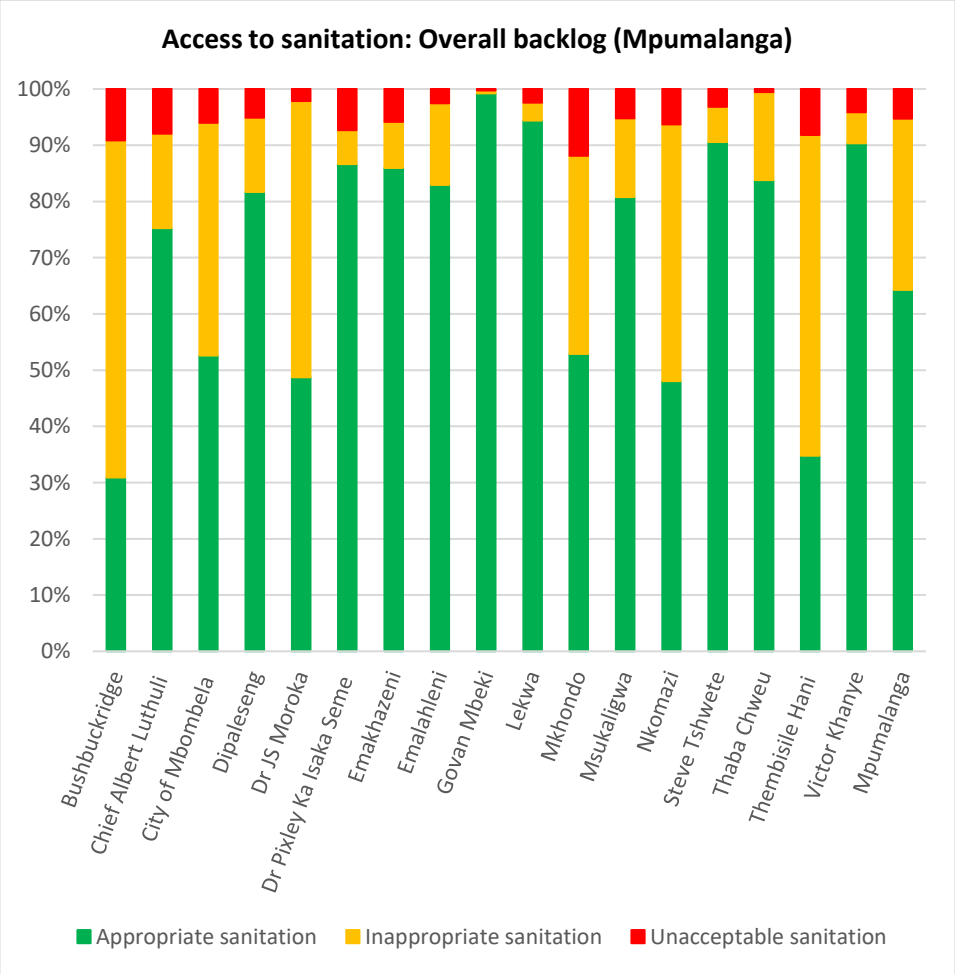


FIGURE 8-6: ACCESS TO SANITATION AND OVERALL BACKLOG IN MPUMALANGA

TABLE 8-3: RATE OF SANITATION DELIVERY AND LIKELIHOOD OF WSAS IN MPUMALANGA TO ACHIEVE BACKLOG ERADICATION

Rate of delivery (years to eradicate backlog) (as of 2021)	End date	Years to achieve	Rate of delivery (years to eradicate backlog) (as of 2021)	End date	Years to achieve
Bushbuckridge	2138	117	Lekwa	2025	4
Chief Albert Luthuli	2029	8	Mkhondo	2103	82
City of Mbombela	2159	138	Msukaligwa	2032	11
Dipaleseng	2020	-2	Nkomazi	2065	44
Dr JS Moroka	2037	16	Steve Tshwete	2030	9
Dr Pixley Ka Isaka Seme	2023	2	Thaba Chweu	2026	5
Emakhazeni	2033	12	Thembisile Hani	2163	142
Emalahleni	2032	11	Victor Khanye	2024	3
Govan Mbeki	2022	1			

NOTE: The figures above were calculated in 2021. Has there been progress since then? Has the rate of sanitation service delivery (i) increased, (ii) stayed the same, or (iii) decreased? Understanding (a) sanitation backlog and (b) the rate of sanitation service delivery will help to determine if WSAs are on track to meet sanitation access-related SDGs.

From Table 8-3 above:

- 1 WSA has already eradicated its backlog (blue).
- 7 WSAs have a good chance of eradicating their backlog by 2030 (green).
- 2 WSAs are likely to make progress but are likely to eradicate backlogs only partially (yellow).
- 7 WSAs are not addressing their backlogs quickly enough and are unlikely to achieve backlog eradication.

8.5 Municipal sanitation status: Mpumalanga

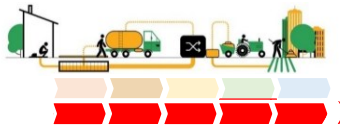
Where is Mpumalanga doing well?

Although access to sanitation has improved since 1994, the status of containment, emptying and transport and treatment has been categorised as 'poor' for the Mpumalanga province. The status of disposal and reuse has also been categorised as 'poor' for the Mpumalanga province. All components of the sanitation service chain are therefore categorised as 'poor'. It is not surprising that institutional aspects are also far from ideal. There appears to be little innovation or value add related to the sanitation sector in the province. Challenges are compounded by growing informal settlements. Unfortunately, there is much work to do to improve sanitation in the province.

water & sanitation
Department: Water and Sanitation
REPUBLIC OF SOUTH AFRICA

National Sanitation Integrated Plan

Provincial Status Report
Mpumalanga



Provincial Status
Poor

National Status

Total Provinces
9

			Data Set (indicates number of WSAs with data submitted)
Context			
Population (DWS WSKS) (April 2023)	4748541		17 / 17
Number of households (DWS WSKS) (April 2023)	1506471 HH		17 / 17
Number of wastewater treatment works	76		17 / 17
Number of sewer pump stations	195		17 / 17
Length of sewer pipelines	1635 km		3 / 17
Containment		**Poor**	
1.1 No sanitation (backlog) (DWS WSKS) (April 2023)	5 % HH	Poor	17 / 17
1.2 Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)	36 % HH	Poor	17 / 17
1.3 Average rate of sanitation delivery (years to eradicate backlog)	36 years	Average	17 / 17
Emptying and Transport		**Poor**	
2.1 Sewer network condition	NI		0 / 17
2.2 Pit toilet emptying	71 % of WSAs	Average	16 / 17
2.3 Vacuum truck / honeysucker needs	37 trucks	Poor	15 / 17
2.4 Vacuum truck / honeysucker condition	35 % in fair condition	Average	13 / 17
Treatment		**Poor**	
3.1 % of wastewater treatment works design capacity utilised	51 %	Average	13 / 17
3.1.1 Design capacity	352.0 Ml/d		17 / 17
3.1.2 Available capacity	177.6 Ml/d		17 / 17
3.1.3 Operational capacity	177.6 Ml/d		13 / 17
3.2 Wastewater treatment works effluent quality	26 % compliance	Poor	17 / 17
3.2.1 Microbiological compliance	19 %		17 / 17
3.2.2 Chemical compliance	25 %		17 / 17
3.2.3 Physical compliance	34 %		17 / 17
3.3 Wastewater treatment works staffing shortfall	33 %	Poor	17 / 17
3.3.1 Number of supervisor(s): Compliant	33		17 / 17
3.3.2 Number of supervisor(s): Shortfall	12		17 / 17
3.3.3 Number of PC(s): Compliant	153		17 / 17
3.3.4 Number of PC(s): Shortfall	80		17 / 17
Disposal and Reuse		**Poor**	
4.1 Analysis and classification of wastewater sludge	24 % of WSAs	Poor	16 / 17
4.2 Wastewater sludge management	18 % acceptable practices		15 / 17
4.3 Analysis and classification of faecal sludge	24 % of WSAs	Poor	16 / 17
4.4 Faecal sludge management	82 % acceptable practices		16 / 17
4.5 Treated wastewater effluent reuse	6 % of WSAs	Poor	16 / 17
Institutional Aspects		**Poor**	
5.1 Green Drop performance (2021)	49 %	Poor	17 / 17
5.2 Sanitation staff vacancies	45 %	Poor	16 / 17
5.3 Sanitation business financial status	65 % of WSAs operate a deficit	Poor	16 / 17
5.4 Growing informal settlements	47 % of WSAs		11 / 17
5.5 Shit-flow diagrams developed for sanitation systems	24 % of WSAs		15 / 17
5.6 Alternative/innovative sanitation processes or technologies implemented	53 % of WSAs have implement multiple		17 / 17
5.6.1 Toilets	*47* % of WSAs		15 / 17
5.6.2 Emptying	*18* % of WSAs		16 / 17
5.6.3 Transport	*41* % of WSAs		14 / 17
5.6.4 Treatment	*41* % of WSAs		14 / 17
5.6.5 Disposal benefication	*0* % of WSAs		13 / 17
5.6.6 New business models	*24* % of WSAs		14 / 17

FIGURE 8-7: SANITATION STATUS IN MPUMALANGA

8.6 1st order excreta flow diagram (SFD): Mpumalanga

What are some of the contributors to poor sanitation performance?

The 1st order SFD for Mpumalanga (Figure 8-8) highlights significant gaps in the sanitation service chain. These deficiencies all potentially have a negative impact on communities.

Containment:

- Inappropriately constructed on-site sanitation systems (e.g. not sealed on-site sanitation systems)

Emptying and transport:

- Inadequate maintenance and servicing of basic sanitation systems 41% (e.g. not emptied)
- Lost sewage due to old and leaking pipes

Treatment:

- Poorly operated, maintained and managed WWTWs resulting in poor performance or non-compliance
- More than 40% of WWTW in critical state

End-use or disposal:

- Inadequate sludge analysis and classification, and resultant inappropriate sludge disposal and/or non-beneficial use

Institutional:

- Inadequate sanitation systems or programme funding.
- Lack of provision of Green Drop data to the regulator

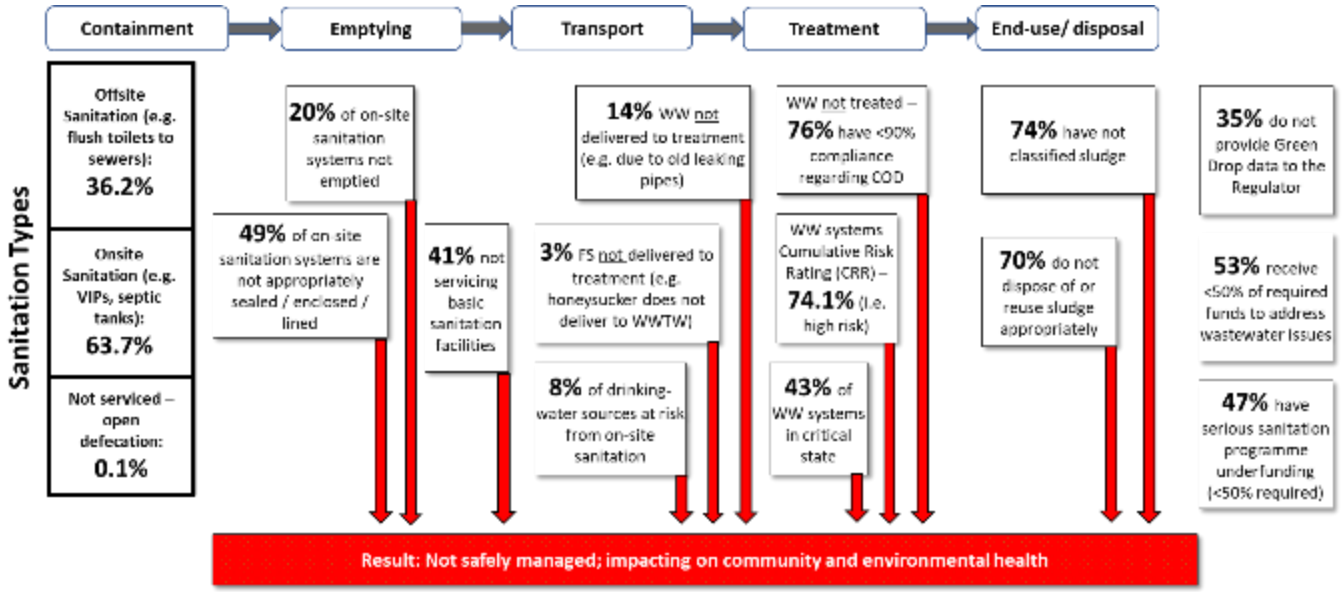
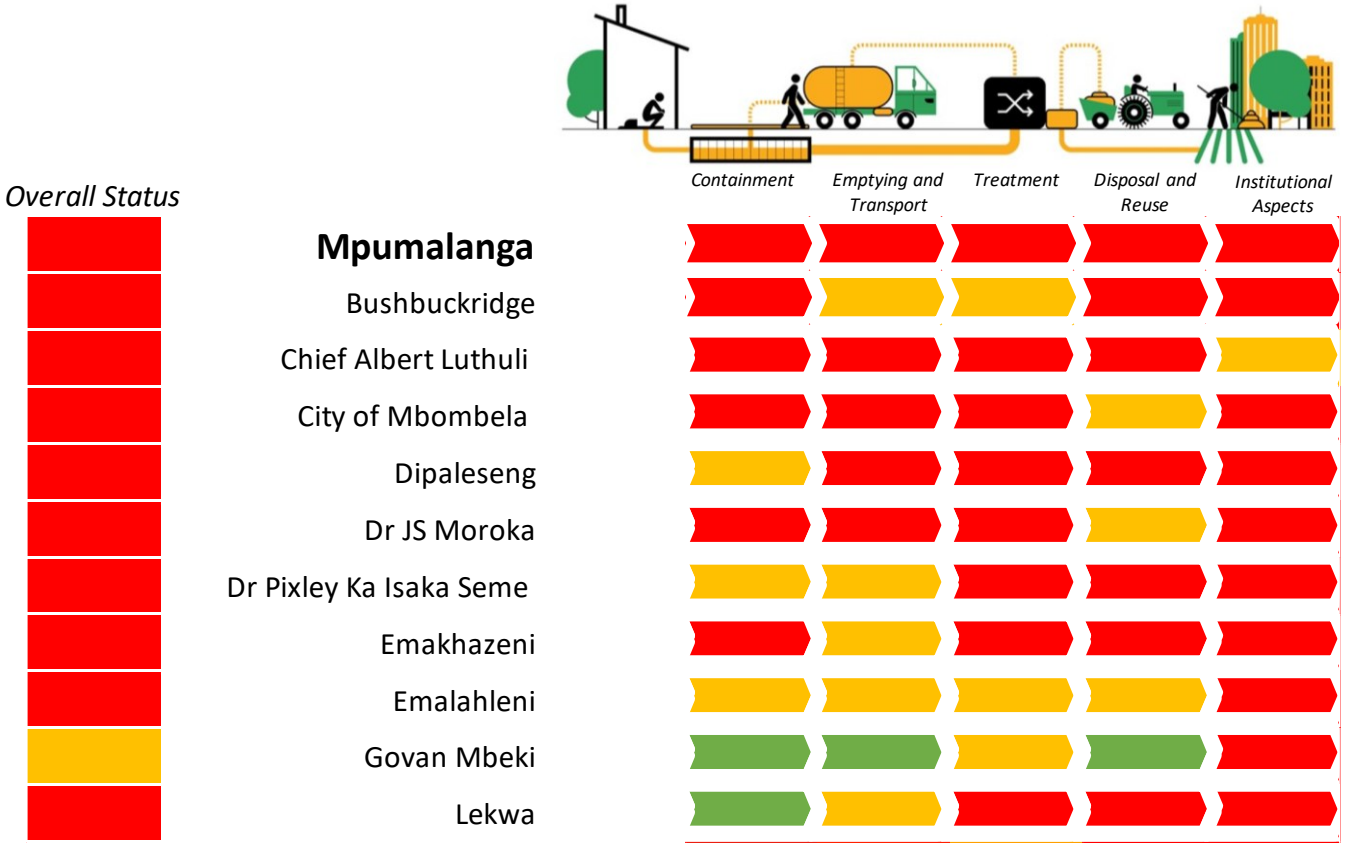


FIGURE 8-8: 1ST ORDER SFD: MPUMALANGA

8.7 Sanitation status along the service chain

An analysis of the sanitation service chain shows there is much work to do

A total of 15 indicators were selected and analysed to assess the status of the sanitation service chain, focusing on the quality of available data. This includes three indicators for each of the four service chain components, plus three additional indicators addressing institutional aspects. The analysis results for Mpumalanga, obtained from the situational analysis tool developed as part of the NSIP Project, are presented visually in Figure 8-9 to Figure 8-11. The colour coding used in the analysis indicates effectiveness levels based on predefined scoring criteria. Green signifies that systems are functioning well and meeting expectations, while amber indicates average performance with identified areas for improvement. In contrast, red highlights poor performance or significant issues that require immediate attention (refer to Appendix B of the Monitoring Framework and Guide for detailed scoring rules). The visual representation in Figure 8-9 provides a comprehensive overview of the sanitation status along the service chain for all provinces in the country, allowing for quick and easy assessment at a glance.



Overall score	
>75%	Good
50%-75%	Average
<50%	Poor

- The performance of Mpumalanga and most WSAs falls short of the desired standard, with just two WSAs (Govan Mbeki and Steve Tshwete) achieving an 'average' overall status.
- However, there are notable pockets of good performance observed in containment, emptying and transport, as well as treatment practices.
- Additionally, one WSA (Govan Mbeki) is performing well in disposal and reuse.
- A considerable amount of work still needs to be done to enhance sanitation in Mpumalanga. The health of the sanitation service chain is far from ideal, with institutional aspects predominantly categorised as 'poor' across most WSAs, with only two WSAs (Chief Albert Luthuli and Steve Tshwete) managing to attain an 'average' status in this regard.

FIGURE 8-9: OVERVIEW OF SANITATION STATUS ALONG THE SERVICE CHAIN FOR WSAS IN MPUMALANGA

8.7.1 Heat map: Mpumalanga

The heat map further highlights key deficiencies in the sanitation service chain

The results of the analysis of the 15 indicators are represented for all the WSAs in Mpumalanga in the heat map in Figure 8-10. Green signifies that systems are functioning well and meeting the expectations defined by the scoring criteria. Amber indicates average performance, suggesting areas that require improvement, while red highlights poor performance or significant issues that require immediate attention. Although there are pockets of good performance, overall, the performance is far from ideal.

Indicator #	Mpumalanga	Bushbuckridge	Chief Albert Luthuli	City of Mbombela	Dipaleseng	Dr JS Moroka	Dr Pixley Ka Isaka Seme	Emakhazeni	Emalahleni	Govan Mbeki	Lekwa	Mkhondo	Msukaligwa	Nkomazi	Steve Tshwete	Thaba Chweu	Thembisile Hani	Victor Khanye
	Overall sanitation status																	
	Containment																	
1	No sanitation (backlog) (DWS WSKS) (April 2023)																	
2	Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)																	
3	Rate of sanitation delivery (backlog eradication)																	
	Emptying and Transport																	
4	Pit toilet emptying																	
5	Vacuum truck / honeysucker needs																	
6	Vacuum truck / honeysucker condition																	
	Treatment																	
7	WWTW design capacity utilised																	
8	WWTW effluent quality																	
9	WWTW staffing shortfall																	
	Disposal and Reuse																	
10	Analysis and classification of wastewater sludge Wastewater sludge management																	
11	Analysis and classification of faecal sludge Faecal sludge management																	
12	Treated wastewater effluent reuse																	
	Institutional Aspects																	
13	Green Drop performance																	
14	Sanitation staff vacancies																	
15	Sanitation business financial status																	

Green – Good | Amber – Average | Red – Poor

FIGURE 8-10: HEAT MAP SHOWING THE STATUS OF THE 15 INDICATORS FOR WSAS IN MPUMALANGA

8.7.2 Rating WSAs in Mpumalanga: Sanitation service chain elements

The performance of each of the 15 indicators of the sanitation service chain highlights key deficiencies at WSAs

Using the heat map and total scores of the 15 indicators, each WSA in Mpumalanga is ranked from poorest-performing on the left to best-performing on the right, as shown in Figure 8-11. WSAs facing significant challenges across the sanitation service chain, including related institutional factors, are marked mostly in red, starting on the far left, while those that are performing well are indicated mostly in green, moving towards the far right.

The 15 sanitation service chain elements that are rated are indicated below:

	Containment
1.	No sanitation (backlog)
2.	Inappropriate sanitation (backlog)
3.	Rate of sanitation delivery (years to eradicate backlog)
	Emptying and transport
4.	Pit toilet emptying
5.	Vacuum truck/honeysucker needs
6.	Vacuum truck/honeysucker condition
	Treatment
7.	WWTW design capacity utilised
8.	WWTW effluent quality
9.	WWTW staffing shortfall
	Disposal and reuse
10.	Analysis and classification of wastewater sludge
	Wastewater sludge management
11.	Analysis and classification of FS
	FSM
12.	Treated wastewater effluent reuse
	Institutional aspects
13.	Green Drop performance (2021)
14.	Sanitation staff vacancies
15.	Sanitation business financial status

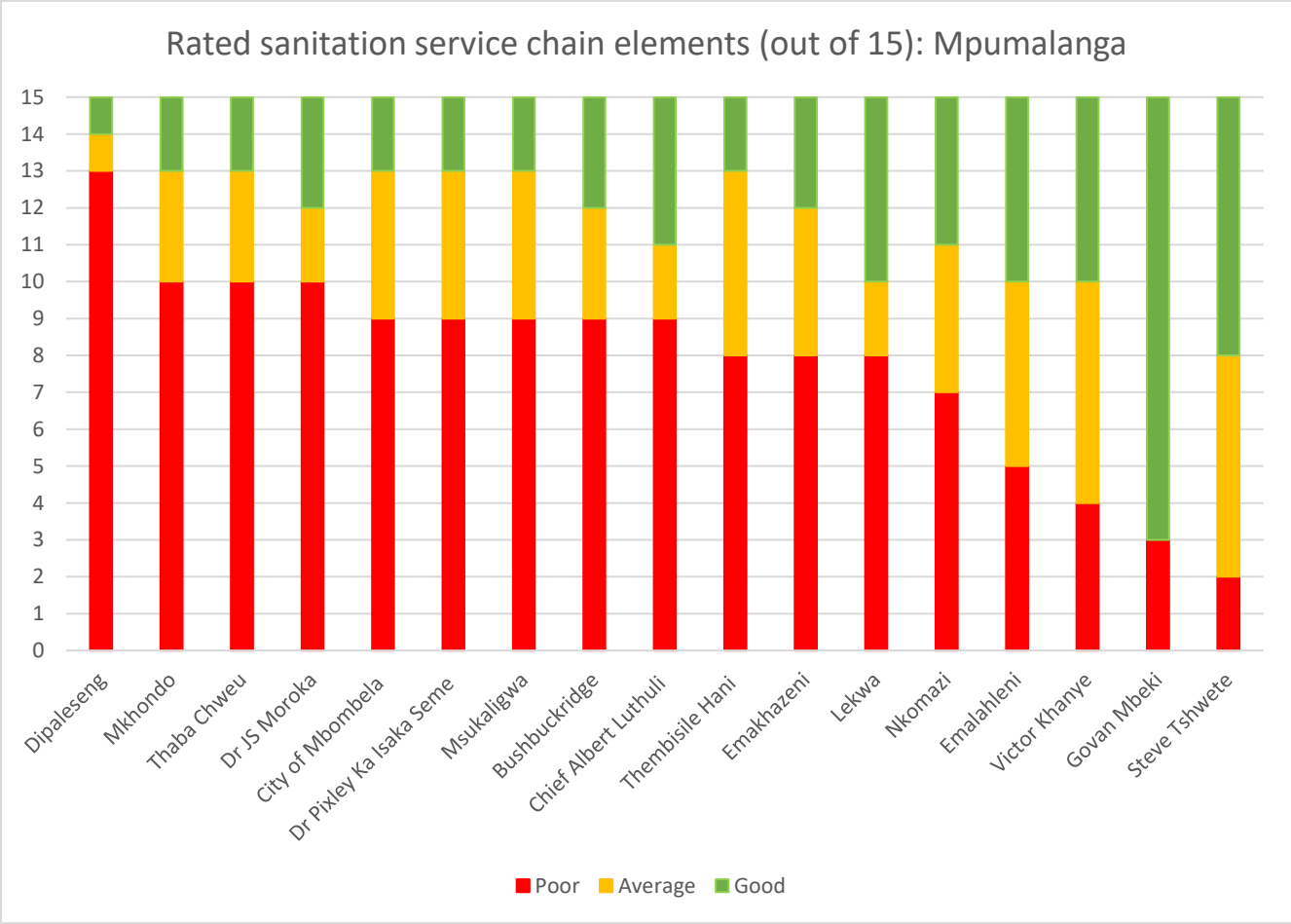


FIGURE 8-11: RATED WSAS IN MPUMALANGA BASED ON THE PERFORMANCE OF THE 15 INDICATORS (LEFTMOST COLUMN = POOREST PERFORMER; RIGHTMOST COLUMN = BEST PERFORMER)

8.8 Key findings: Mpumalanga

Is Mpumalanga's sanitation in good health?

The analysis below provides a snapshot of Mpumalanga's sanitation status as of 2022/23.

Overall

The sanitation status of the Mpumalanga province can be categorised as 'poor'.

Access to sanitation/Containment

Limpopo has a near-even rural–urban split, with 48% of households in rural areas and 52% in urban areas. Overall, 44% of households in the province are connected to the sewer system, while 51% rely on on-site sanitation. Additionally, 5% of the households have no access to sanitation. Consistent with the general trend across South Africa, urban areas in Limpopo have better access to sewered systems, with 64% of urban households connected to the sewer network. In contrast, rural areas are more dependent on on-site sanitation solutions, with 71% of rural households using on-site sanitation systems.

Bucket and chemical toilets

Since 2016, the number of households using bucket toilets in Mpumalanga has remained relatively stable. As of 2023, over 10 000 households in the province continue to rely on bucket toilets. Similarly, the use of chemical toilets has remained relatively consistent since 2019, with more than 82 000 households served by chemical toilets as of 2023 (DWS, 2023a). The continued use of bucket toilets and the increasing reliance on chemical toilets contribute to the ongoing 'inappropriate sanitation' backlog across WSAs in the province. These types of sanitation solutions, while providing a temporary alternative, do not meet the standards of more permanent and hygienic sanitation infrastructure.

Sanitation backlog

Overall, Mpumalanga is not on track to meet sector targets by 2030 (e.g. SDG 6.2). Ten WSAs (Bushbuckridge, Chief Albert Luthuli, City of Mbombela, Dipaleseng, Dr Pixley Ka Isaka Seme, Emakhazeni, Mkhondo, Msukaligwa, Nkomazi and Thembisile Hani) have a 'no service' backlog exceeding 5%, which is categorised as 'poor'. Seven WSAs (Bushbuckridge, Chief Albert Luthuli, City of Mbombela, Dr JS Moroka, Mkondo, Nkomazi and Thembisile Hani) have an 'inappropriate sanitation' backlog exceeding 20%, also categorised as 'poor'. Given the current rate of sanitation delivery (years to eradicate backlog), it is highly unlikely that nine WSAs (City of Mbombela, Dr JS Moroka, Emakhazeni, Emalahleni, Mkondo, Msukaligwa, Nkomazi, Thembisile Hani and Bushbuckridge) will eradicate their backlog by 2030.

Emptying and transport

Five WSAs (City of Mbombela, Dipaleseng, Msukaligwa, Thaba Chweu and Thembisile Hani) indicated that they do not empty pits. This means that users need to empty their own pits, dig their own new pits, or resort to other means. WSAs need to ensure that users are aware of appropriate safety and hygiene measures to follow. Eleven WSAs (Chief Albert Luthuli, City of Mbombela, Dipaleseng, Dr JS Moroka, Emakhazeni, Emalahleni, Lekwa, Mkondo, Msukaligwa, Nkomazi and Thaba Chweu) indicated a significant shortage of vacuum trucks and honeysuckers with their need exceeding 100% of their current fleet (i.e. they need to at least double their fleet). This result also seems to indicate that pit-emptying could currently be limited by the number of vacuum trucks and honeysuckers available. Furthermore, the condition of most of the existing vacuum trucks and honeysuckers is far from ideal, with six WSAs (Bushbuckridge, Chief Albert Luthuli, Dipaleseng, Dr JS Moroka, Mkondo and Thaba Chweu) indicating that they are in poor condition. This implies that breakdowns are inevitable and indicates a further vulnerability in emptying and transport.

Treatment

Eight WSAs utilise WWTWs within their design capacity. However, six WSAs (Dipaleseng, Dr JS Moroka, Dr Pixley Ka Isaka Seme, Lekwa, Msukaligwa and Thaba Chweu) have WWTWs where the design capacity exceeds 90% utilisation. Furthermore, the performance of many WWTWs is not ideal, with 15 WSAs (Bushbuckridge, Chief Albert Luthuli, City of Mbombela, Dipaleseng, Dr JS Moroka, Dr Pixley Ka Isaka Seme, Emakhazeni, Emalahleni, Govan Mbeki, Lekwa, Mkondo, Msukaligwa, Thaba Chweu, Thembisile Hani and Victor Khanye) having a treated effluent quality with an overall compliance of less than 50%. Most WSAs indicated a significant challenge with WWTW staffing, with seven WSAs (Chief Albert Luthuli, Dipaleseng, Dr Pixley Ka Isaka Seme, Emakhazeni, Lekwa, Msukaligwa and Thaba Chweu) indicating an overall WWTW staffing shortfall greater than 35%.

Disposal and reuse

Five WSAs (Chief Albert Luthuli, Dipaleseng, Dr Pixley Ka Isaka Seme, Lekwa and Mkhondo) scored poorly for wastewater sludge management as they do not analyse

and classify their wastewater sludge and/or do not proactively manage their sludge end-use or disposal. Two WSAs (Dipaleseng and Mkhondo) scored poorly for FSM as they do not analyse and classify their FS and/or do not proactively manage their sludge end-use or disposal. Despite this, it is noted that 13 WSAs co-treat FS at their WWTWs. This could also be contributing to the poor performance noted. All 17 WSAs (Bushbuckridge, Chief Albert Luthuli, City of Mbombe, Dipaleseng, Dr JS Moroka, Dr Pixley Ka Isaka Seme, Emakhazeni, Emalahleni, Govan Mbeki, Lekwa, Mkondo, Msukaligwa, Nkomazi, Steve Tshwete, Thaba Chweu, Thembisile Hani and Victor Khanye) do not reuse treated wastewater effluent for any purpose. This lack of reuse could be because of the poor quality of treated effluent.

Institutional aspects

Thirteen WSAs (Bushbuckridge, Chief Albert Luthuli, Dipaleseng, Dr JS Moroka, Dr Pixley Ka Isaka Seme, Emakhazeni, Emalahleni, Govan Mbeki, Lekwa, Msukaligwa,Thaba Chweu, Thembisile Hani and Victor Khanye) have very poor Green Drop performance, scoring less than 50%. Twelve WSAs (Bushbuckridge, City of Mbombela, Dipaleseng, Dr JS Moroka, Dr Pixley Ka Isaka Seme, Emakhazeni, Emalahleni, Govan Mbeki, Lekwa, Msukaligwa, Nkomazi and Thaba Chweu) have significant sanitation staff challenges with sanitation staff vacancies of more than 35%. Twelve WSAs (Bushbuckridge, City of Mbombela, Dipaleseng, Dr JS Moroka, Dr Pixley Ka Isaka Seme, Emakhazeni, Mkondo, Nkomazi, Steve Tshwete Thaba Chweu, Thembisile Hani and Victor Khanye) indicated that the financial status of their sanitation business is far from ideal and is running at a deficit.

Photo: Patrick Federi on Unsplash

9 Situational analysis: Northern Cape

Section 9 provides a summary of data and findings from the **Northern Cape Situational Analysis** report.

For access to the full report, scan the QR code above.

What is the current reality in the province?

9.1 Northern Cape overview

Water services authorities

WSAs are responsible for supplying both water and sanitation services to households in their area of jurisdiction. In the Northern Cape, there are:

- 5 district municipalities
- 26 local municipalities
- 26 WSAs

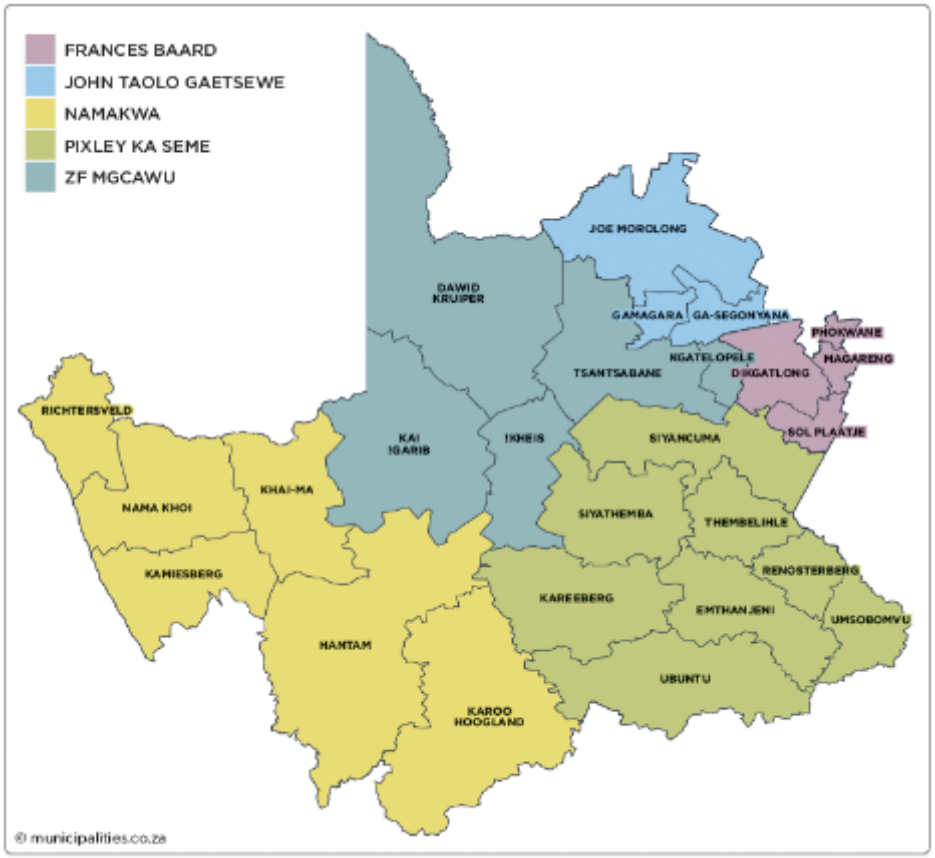


FIGURE 9-1: MUNICIPALITIES AND WSAS IN THE NORTHERN CAPE

District municipalities
Frances Baard
John Taolo Gaetsewe
Namakwa
Pixley Ka Seme
ZF Mgcawu

Local municipalities		
Dikgatlong*	Karoo Hoogland*	Thembelihle*
Magareng*	Khai-Ma*	Ubuntu*
Phokwane*	Nama Khoi*	Umsobomvu*
Sol Plaatje*	Richtersveld*	!Kheis*
Ga-Segonyana*	Emthanjeni*	Dawid Kruiper*
Gamagara*	Kareeberg*	Kai !Garib*
Joe Morolong*	Renosterberg*	Kgatelopele*
Hantam*	Siyancuma*	Tsantsabane*
Kamiesberg*	Siyathemba*	

(* indicates WSA)

9.2 Access to sanitation: Households

Sanitation service levels per household: A provincial view

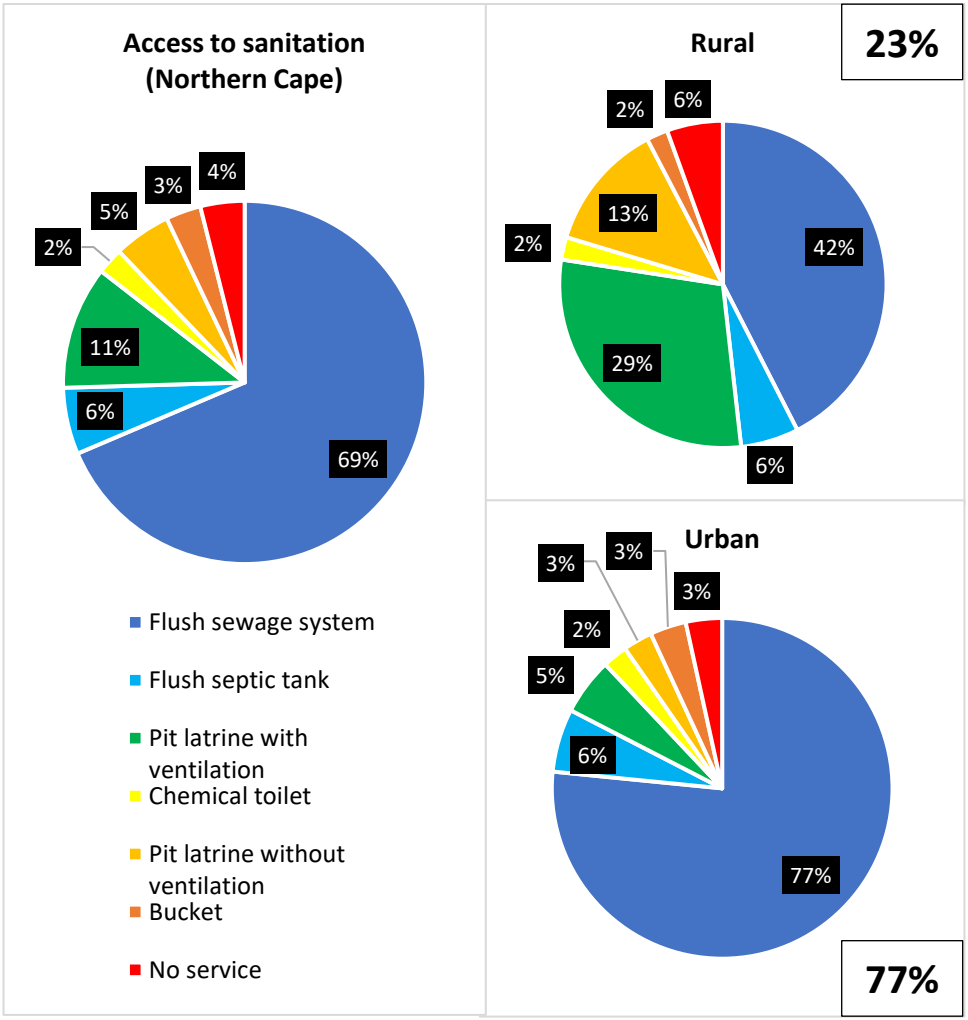


FIGURE 9-2: SANITATION SERVICE LEVELS PER HOUSEHOLD IN THE NORTHERN CAPE

An analysis of sanitation provision by settlement type (see Figure 9-2 and Table 9-3) depicts a total number of 375 542 households in Northern Cape, of which 87 921 (23%) are rural settlements and 287 621 (77%) urban settlements (DWS, 2022b).

The data shows that provincially:

- **69%** of households have access to a flush toilet connected to the sewage system.
- **4%** of households do not have access to sanitation (implying open defecation).
- The remaining **28%** of households utilise some form of on-site sanitation system, including septic tanks (6%), pit latrines with ventilation (i.e. VIPs) (11%), chemical toilets (2%), pit latrines without ventilation (5%) and bucket latrines (3%).

In rural settlements:

- **42%** of households have access to a flush toilet connected to the sewage system.
- **6%** of households do not have access to sanitation (implying open defecation).
- The remaining **52%** of households utilise some form of on-site sanitation system, including septic tanks (6%), pit latrines with ventilation (i.e. VIPs) (29%), chemical toilets (2%), pit latrines without ventilation (13%) and bucket latrines (2%).

In urban settlements:

- **77%** of households have access to a flush toilet connected to the sewage system.
- **3%** of households do not have access to sanitation (implying open defecation).
- The remaining **20%** of households utilise some form of on-site sanitation system, including septic tanks (6%), pit latrines with ventilation (i.e. VIPs) (5%), chemical toilets (2%), pit latrines without ventilation (3%) and bucket latrines (3%).

The analysis of sanitation provision by settlement type at the WSA level in the Northern Cape is depicted in Figure 9-3 and detailed in Table 9-1, Table 9-2, and Table 9-3.

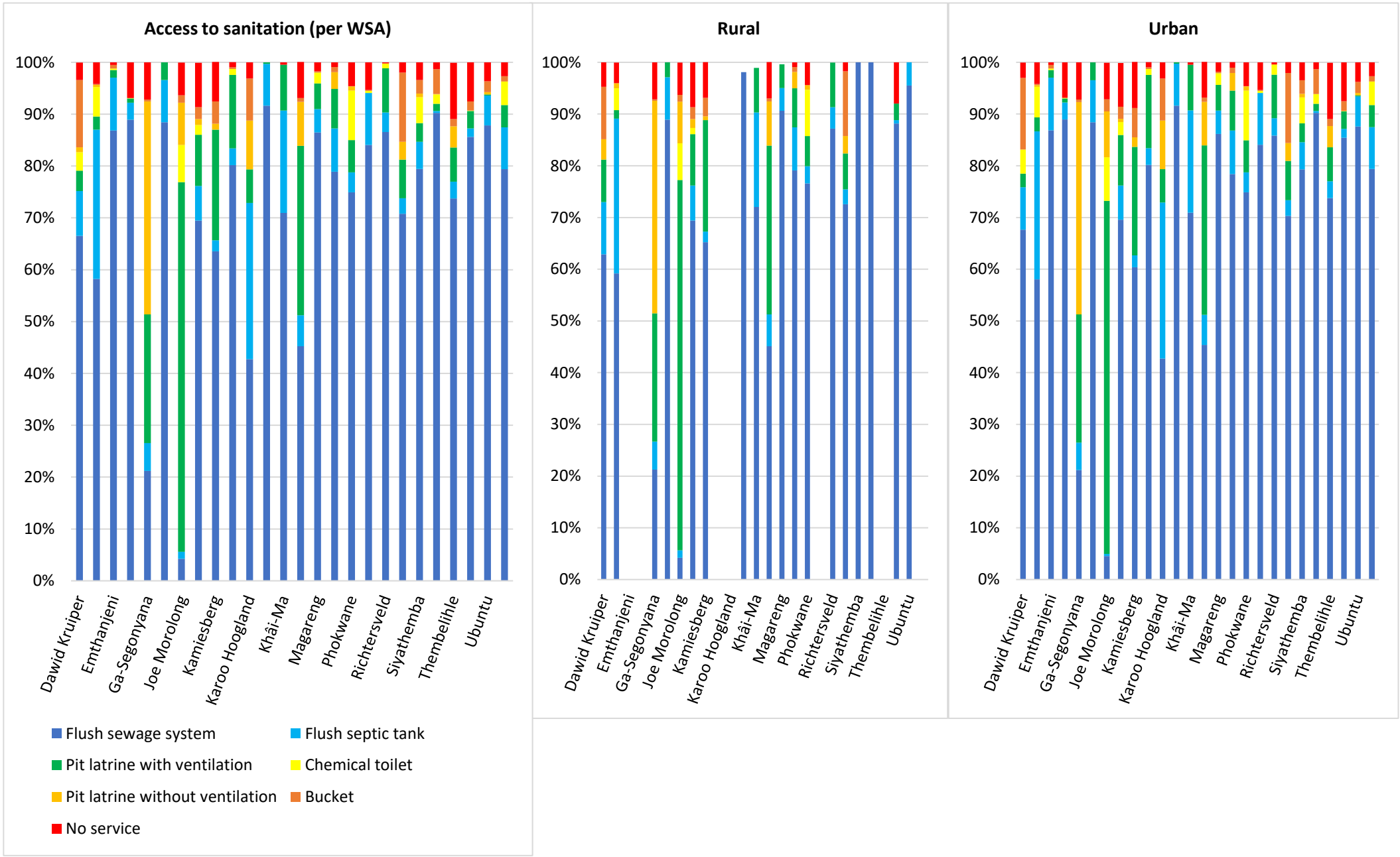


FIGURE 9-3: SANITATION SERVICE LEVELS PER HOUSEHOLD IN 26 WSAS IN THE NORTHERN CAPE

TABLE 9-1: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN THE NORTHERN CAPE (1)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Dawid Kruiper	30 516		20 300	67	2 644	9	1 201	4	1 080	4	288	1	3 965	13	1 027	3
Rural	7 124	23	4 481	63	719	10	584	8	0	0	280	4	723	10	336	5
Urban	23 392	77	15 819	68	1 925	8	617	3	1 080	5	8	0	3 242	14	691	3
Dikgatlong	15 757		9 172	58	4 538	29	401	3	894	6	68	0	27	0	657	4
Rural	2 298	15	1 360	59	688	30	38	2	97	4	22	1	0	0	92	4
Urban	13 459	85	7 812	58	3 850	29	363	3	797	6	46	0	27	0	565	4
Emthanjeni	12 674		11 006	87	1 294	10	184	1	36	0	0	0	90	1	64	1
Rural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban	12 674	100	11 006	87	1 294	10	184	1	36	0	0	0	90	1	64	1
Gamagara	16 712		14 865	89	548	3	131	1	20	0	0	0	0	0	1 148	7
Rural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban	16 712	100	14 865	89	548	3	131	1	20	0	0	0	0	0	1 148	7
Ga-Segonyana	34 591		7 337	21	1 859	5	8 580	25	0	0	14 206	41	132	0	2 474	7
Rural	19 859	57	4 218	21	1 076	5	4 929	25	0	0	8 160	41	58	0	1 415	7
Urban	14 732	43	3 119	21	783	5	3 651	25	0	0	6 046	41	74	1	1 059	7
Hantam	7 323		6 478	88	595	8	249	3	0	0	0	0	0	0	0	0
Rural	450	6	400	89	37	8	13	3	0	0	0	0	0	0	0	0
Urban	6 873	94	6 078	88	558	8	236	3	0	0	0	0	0	0	0	0
Joe Morolong	25 226		1 073	4	339	1	17 981	71	1 817	7	2 049	8	364	1	1 593	6
Rural	22 875	91	966	4	329	1	16 376	72	1 620	7	1 840	8	309	1	1 427	6
Urban	2 351	9	107	5	10	0	1 605	68	197	8	209	9	55	2	166	7
Kai !Garib	24 449		16 989	69	1 635	7	2 409	10	460	2	276	1	570	2	2 092	9
Rural	11 787	48	8 182	69	796	7	1 172	10	142	1	200	2	272	2	1 024	9
Urban	12 662	52	8 807	70	839	7	1 237	10	318	3	76	1	298	2	1 068	8
Kamiesberg	3 510		2 230	64	75	2	749	21	0	0	40	1	151	4	267	8
Rural	2 288	65	1 492	65	47	2	493	22	0	0	17	1	82	4	158	7
Urban	1 222	35	738	60	28	2	256	21	0	0	23	2	69	6	109	9

TABLE 9-2: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN THE NORTHERN CAPE (2)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Kareeberg	3 896		3 123	80	127	3	552	14	44	1	0	0	13	0	38	1
Rural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban	3 896	100	3 123	80	127	3	552	14	44	1	0	0	13	0	38	1
Karoo Hoogland	4 911		2 099	43	1 481	30	316	6	0	0	463	9	399	8	152	3
Rural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban	4 911	100	2 099	43	1 481	30	316	6	0	0	463	9	399	8	152	3
Kgatelopele	6 587		6 037	92	531	8	18	0	0	0	0	0	0	0	0	0
Rural	53	1	52	98	0	0	0	0	0	0	0	0	0	0	0	0
Urban	6 534	99	5 985	92	531	8	18	0	0	0	0	0	0	0	0	0
Khâi-Ma	4 331		3 073	71	855	20	383	9	0	0	0	0	0	0	19	0
Rural	93	2	67	72	17	18	8	9	0	0	0	0	0	0	0	0
Urban	4 238	98	3 006	71	838	20	375	9	0	0	0	0	0	0	19	0
Kheis	4 622		2 091	45	276	6	1 511	33	0	0	392	8	33	1	322	7
Rural	2 246	49	1 013	45	138	6	733	33	0	0	192	9	13	1	158	7
Urban	2 376	51	1 078	45	138	6	778	33	0	0	200	8	20	1	164	7
Magareng	7 404		6 403	86	334	5	365	5	155	2	0	0	20	0	125	2
Rural	544	7	493	91	24	4	25	5	0	0	0	0	0	0	0	0
Urban	6 860	93	5 910	86	310	5	340	5	155	2	0	0	20	0	125	2
Nama Khoi	15 450		12 191	79	1 293	8	1 174	8	0	0	497	3	152	1	142	1
Rural	11 424	74	9 034	79	955	8	864	8	0	0	359	3	110	1	100	1
Urban	4 026	26	3 157	78	338	8	310	8	0	0	138	3	42	1	42	1
Phokwane	20 818		15 602	75	799	4	1 291	6	1 992	10	169	1	8	0	957	5
Rural	1 110	5	850	77	37	3	65	6	99	9	10	1	0	0	49	4
Urban	19 708	95	14 752	75	762	4	1 226	6	1 893	10	159	1	8	0	908	5
Renosterberg	3 793		3 188	84	381	10	0	0	15	0	0	0	7	0	202	5
Rural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban	3 793	100	3 188	84	381	10	0	0	15	0	0	0	7	0	202	5

TABLE 9-3: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN THE NORTHERN CAPE (3)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Richtersveld	4 475		3 873	87	169	4	381	9	42	1	0	0	0	0	9	0
Rural	2 343	52	2 043	87	97	4	202	9	0	0	0	0	0	0	0	0
Urban	2 132	48	1 830	86	72	3	179	8	42	2	0	0	0	0	9	0
Siyancuma	10 809		7 652	71	323	3	807	7	0	0	372	3	1 441	13	215	2
Rural	2 267	21	1 645	73	65	3	158	7	0	0	76	3	284	13	39	2
Urban	8 542	79	6 007	70	258	3	649	8	0	0	296	3	1 157	14	176	2
Sol Plaatje	76 472		69 010	90	285	0	1 055	1	1 396	2	48	0	3 655	5	1 021	1
Rural	56	0	56	100	0	0	0	0	0	0	0	0	0	0	0	0
Urban	76 416	100	68 954	90	285	0	1 055	1	1 396	2	48	0	3 655	5	1 021	1
Thembelihle	5 040		3 717	74	163	3	331	7	0	0	207	4	70	1	547	11
Rural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban	5 040	100	3 717	74	163	3	331	7	0	0	207	4	70	1	547	11
Tsantsabane	12 559		10 754	86	205	2	422	3	9	0	0	0	220	2	947	8
Rural	878	7	774	88	6	1	28	3	0	0	0	0	0	0	70	8
Urban	11 681	93	9 980	85	199	2	394	3	9	0	0	0	220	2	877	8
Ubuntu	6 412		5 631	88	371	6	14	0	0	0	27	0	134	2	235	4
Rural	178	3	170	96	8	4	0	0	0	0	0	0	0	0	0	0
Urban	6 234	97	5 461	88	363	6	14	0	0	0	27	0	134	2	235	4
Umsobomvu	10 172		8 074	79	824	8	435	4	462	5	0	0	105	1	273	3
Rural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban	10 172	100	8 074	79	824	8	435	4	462	5	0	0	105	1	273	3
Northern Cape	**375 542**		**257 556**	**69**	**22 310**	**6**	**41 194**	**11**	**8 773**	**2**	**19 151**	**5**	**11 740**	**3**	**14 765**	**4**
Rural	**87 921**	**23**	**37 344**	**42**	**5 039**	**6**	**25 688**	**29**	**1 958**	**2**	**11 156**	**13**	**1 851**	**2**	**4 868**	**6**
Urban	**287 621**	**77**	**220 212**	**77**	**17 271**	**6**	**15 506**	**5**	**6 815**	**2**	**7 995**	**3**	**9 889**	**3**	**9 897**	**3**

9.3 Bucket and chemical toilets in the Northern Cape

Are bucket toilets still in use?

Bucket toilets should have already been eradicated in South Africa. Yet, as of 2023, there are still more than 11 000 households in the Northern Cape using bucket toilets (DWS, 2023b), as illustrated in Figure 9-4.

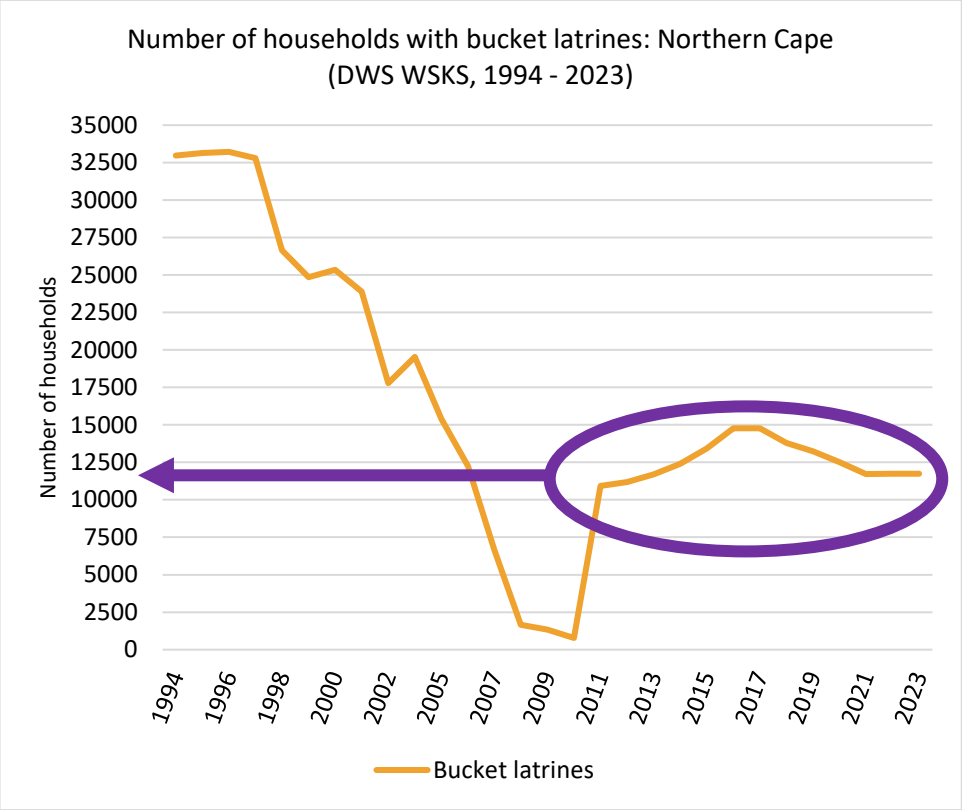


FIGURE 9-4: NUMBER OF HOUSEHOLDS WITH BUCKET LATRINES IN THE NORTHERN CAPE FROM 1994 TO 2023

Are chemical toilets an issue?

Currently, more than 8 000 households in the Northern Cape are served by chemical toilets (DWS, 2023b), as illustrated in Figure 9-5. Can the province afford this?

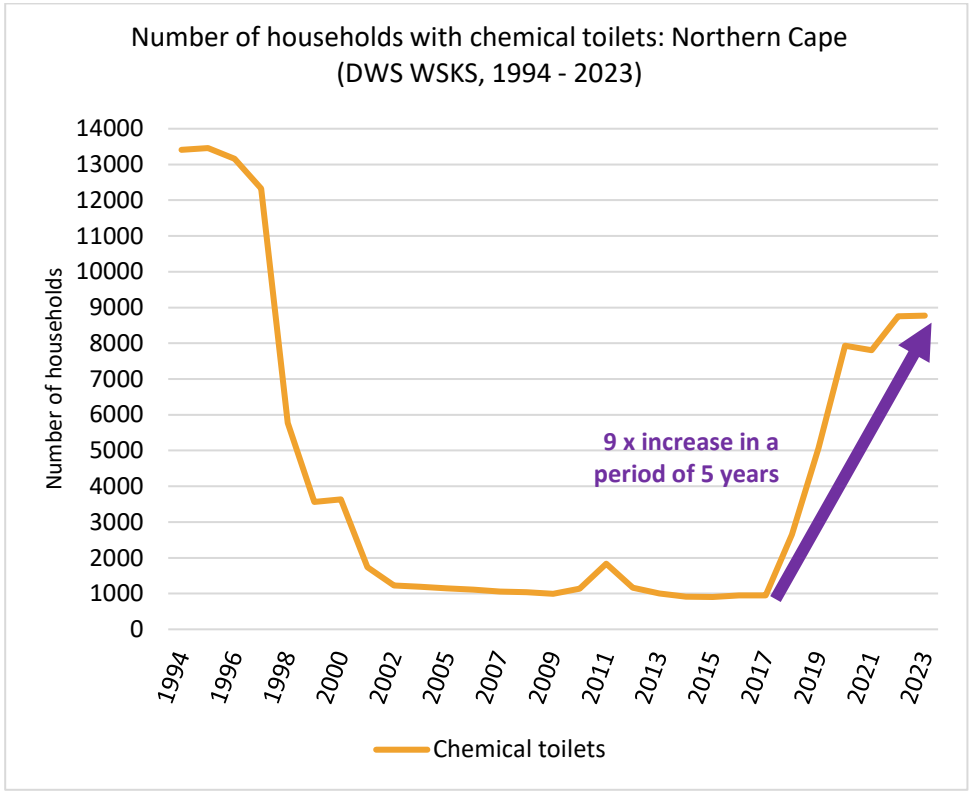


FIGURE 9-5: NUMBER OF HOUSEHOLDS WITH CHEMICAL TOILETS IN THE NORTHERN CAPE FROM 1994 TO 2023

Assuming 2.5 households are served per chemical toilet (i.e., ~10 people per toilet, ~3 200 chemical toilets in operation), and chemical toilet rental costs of R750/month, this equates to a cost of **~R2 million/month** or **~R29 million/year**.

Could innovative sanitation alternatives meet the same needs (or perform even better) at a lower cost?

9.4 Progress on eradicating sanitation backlog

Is the Northern Cape on target to eradicate sanitation backlogs?

WSAs with a significant overall backlog (i.e. inappropriate sanitation systems and no sanitation systems) include Ga-Segonyana (49%), Joe Morolong (23%), Dawid Kruip and Karoo Hoogland (21%). Hantam and Kgatelopele have no sanitation backlogs. Figure 9-6 shows the percentage of appropriate, inappropriate and unacceptable sanitation for each WSA in the Northern Cape, as well as the overall statistics for the province.

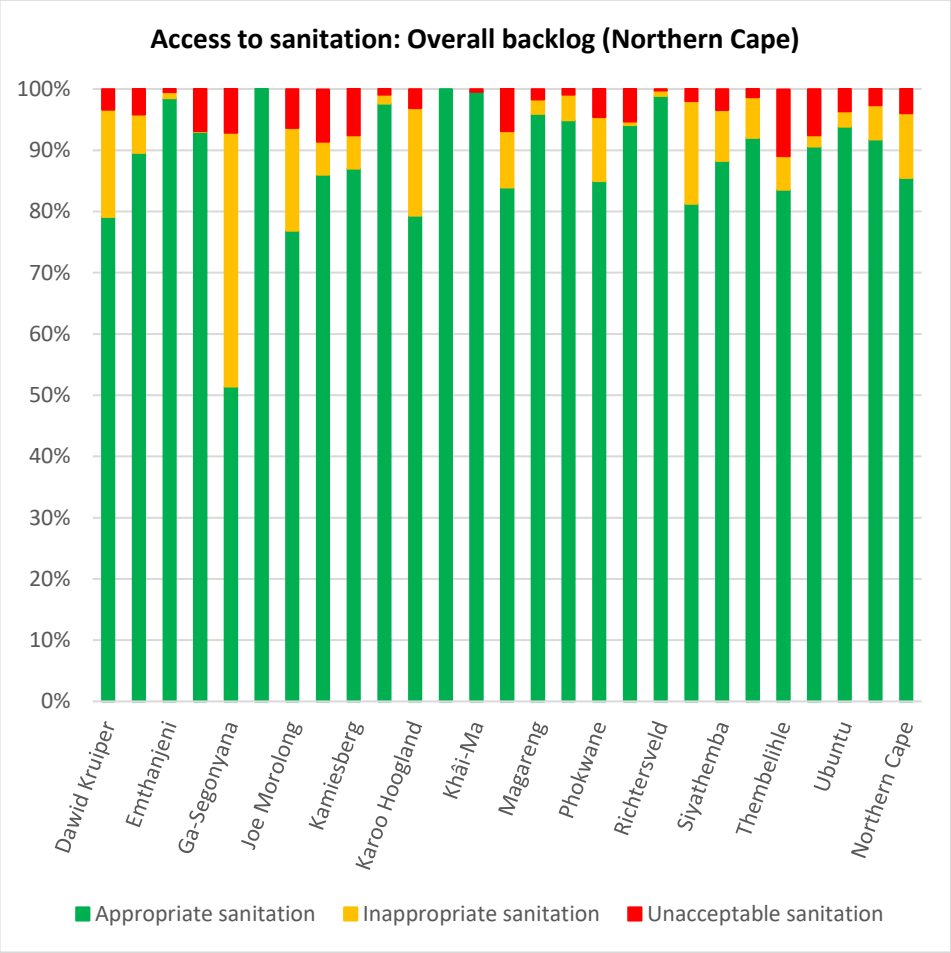


FIGURE 9-6: ACCESS TO SANITATION AND OVERALL BACKLOG IN THE NORTHERN CAPE

TABLE 9-4: RATE OF SANITATION DELIVERY AND LIKELIHOOD OF WSAS IN THE NORTHERN CAPE TO ACHIEVE BACKLOG ERADICATION

Rate of delivery (years to eradicate backlog)(as of 2021)	End date	Years to achieve	Rate of delivery (years to eradicate backlog)(as of 2021)	End date	Years to achieve
Dawid Kruiper	2030	9	Kheis	2021	0
Dikgatlong	2102	81	Magareng	2029	8
Emthanjeni	2022	1	Nama Khoi	2057	36
Gamagara	2028	7	Phokwane	2049	28
Ga-Segonyana	2039	18	Renosterberg	2021	0
Hantam	2021	0	Richtersveld	2023	2
Joe Morolong	2026	15	Siyancuma	2080	159
Kai !Garib	2021	0	Siyathemba	2036	15
Kamiesberg	2027	6	Sol Plaatje	2024	3
Kareeberg	2021	0	Thembelihle	2025	4
Karoo Hoogland	2078	57	Tsantsabane	2058	37
Kgatelopele	2021	0	Ubuntu	2050	29
Khâi-Ma	2021	0	Umsobomvu	2058	37

NOTE: The figures above were calculated in 2021. Has there been progress since then? Has the rate of sanitation service delivery (i) increased, (ii) stayed the same, or (iii) decreased? Understanding (a) sanitation backlog and (b) the rate of sanitation service delivery will help to determine if WSAs are on track to meet sanitation access-related SDGs.

From Table 9-4 above:

- 7 WSAs have already eradicated their backlog (blue).
- 8 WSAs have a good chance of eradicating their backlog by 2030 (green).
- 11 WSAs are not addressing their backlogs quickly enough and are unlikely to achieve backlog eradication.

9.5 Municipal sanitation status: Northern Cape

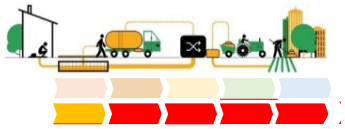
Where is the Northern Cape doing well?

Although access to sanitation has improved since 1994, the status of containment has been categorised as 'average', while emptying and transport and treatment have been categorised as 'poor' for the Northern Cape province. The status of disposal and reuse has also been categorised as 'poor' for the Northern Cape. The analysis has shown that the health of the sanitation service chain is far from ideal. It is not surprising that institutional aspects are also categorised as 'poor'. There appears to be little innovation or value add related to the sanitation sector in the province. Challenges are compounded by growing informal settlements. Unfortunately, there is much work to do to improve sanitation in the province.

water & sanitation
Department: Water and Sanitation
REPUBLIC OF SOUTH AFRICA

National Sanitation Integrated Plan

Provincial Status Report
Northern Cape



Provincial Status: Poor

National Status

Total Provinces
9

			Data Set (*indicates number of WSAs with data submitted*)
Context			
Population (DWS WSKS) (April 2023)	1306385		26 / 26
Number of households (DWS WSKS) (April 2023)	375542	HH	26 / 26
Number of wastewater treatment works	78		26 / 26
Number of sewer pump stations	207		26 / 26
Length of sewer pipelines	1040	km	9 / 26
Containment		**Average**	
1.1 No sanitation (backlog) (DWS WSKS) (April 2023)	4	% HH	Average 26 / 26
1.2 Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)	14	% HH	Average 26 / 26
1.3 Average rate of sanitation delivery (years to eradicate backlog)	21	years	Average 26 / 26
Emptying and Transport		**Poor**	
2.1 Sewer network condition	NI		0 / 26
2.2 Pit toilet emptying	50	% of WSAs	Average 23 / 26
2.3 Vacuum truck / honeysucker needs	55	trucks	Poor 24 / 26
2.4 Vacuum truck / honeysucker condition	54	% in fair condition	Poor 24 / 26
Treatment		**Poor**	
3.1 % of wastewater treatment works design capacity utilised	40	%	Poor 10 / 26
3.1.1 Design capacity	161.5	Ml/d	26 / 26
3.1.2 Available capacity	91.1	Ml/d	26 / 26
3.1.3 Operational capacity	40.9	Ml/d	10 / 26
3.2 Wastewater treatment works effluent quality	6	% compliance	Poor 26 / 26
3.2.1 Microbiological compliance	8	%	26 / 26
3.2.2 Chemical compliance	4	%	26 / 26
3.2.3 Physical compliance	6	%	26 / 26
3.3 Wastewater treatment works staffing shortfall	68	%	Poor 26 / 26
3.3.1 Number of supervisor(s): Compliant	10		26 / 26
3.3.2 Number of supervisor(s): Shortfall	21		26 / 26
3.3.3 Number of PC(s): Compliant	40		26 / 26
3.3.4 Number of PC(s): Shortfall	85		26 / 26
Disposal and Reuse		**Poor**	
4.1 Analysis and classification of wastewater sludge	19	% of WSAs	Poor 24 / 26
4.2 Wastewater sludge management	8	% acceptable practices	19 / 26
4.3 Analysis and classification of faecal sludge	4	% of WSAs	Poor 21 / 26
4.4 Faecal sludge management	81	% acceptable practices	23 / 26
4.5 Treated wastewater effluent reuse	19	% of WSAs	Poor 24 / 26
Institutional Aspects		**Poor**	
5.1 Green Drop performance (2021)	41	%	Poor 26 / 26
5.2 Sanitation staff vacancies	37	%	Poor 18 / 26
5.3 Sanitation business financial status	35	% of WSAs operate a deficit	Poor 18 / 26
5.4 Growing informal settlements	46	% of WSAs	21 / 26
5.5 Shit-flow diagrams developed for sanitation systems	0	% of WSAs	23 / 26
5.6 Alternative/innovative sanitation processes or technologies implemented	4	% of WSAs have implement multiple	26 / 26
5.6.1 Toilets	15	% of WSAs	24 / 26
5.6.2 Emptying	8	% of WSAs	24 / 26
5.6.3 Transport	4	% of WSAs	23 / 26
5.6.4 Treatment	12	% of WSAs	22 / 26
5.6.5 Disposal benefication	0	% of WSAs	23 / 26
5.6.6 New business models	12	% of WSAs	20 / 26

FIGURE 9-7: SANITATION STATUS IN THE NORTHERN CAPE

9.6 1st order excreta flow diagram (SFD): Northern Cape

What are some of the contributors to poor sanitation performance?

The 1st order SFD for the Northern Cape (Figure 9-8) highlights significant gaps in the sanitation service chain. These deficiencies all potentially have a negative impact on communities (e.g. water supply) and the environment (e.g. water sources).

Containment:

- Inappropriately constructed on-site sanitation systems

Emptying and transport:

- Lost sewage due to old and leaking pipes
- Inadequate maintenance and servicing of basic sanitation systems (e.g. not emptied)

Treatment:

- Poorly operated, maintained and managed WWTWs resulting in poor performance or non-compliance

End-use or disposal:

- Inadequate sludge analysis and classification, and resultant inappropriate sludge disposal and/or non-beneficial use

Institutional

- Inadequate sanitation systems or programme funding

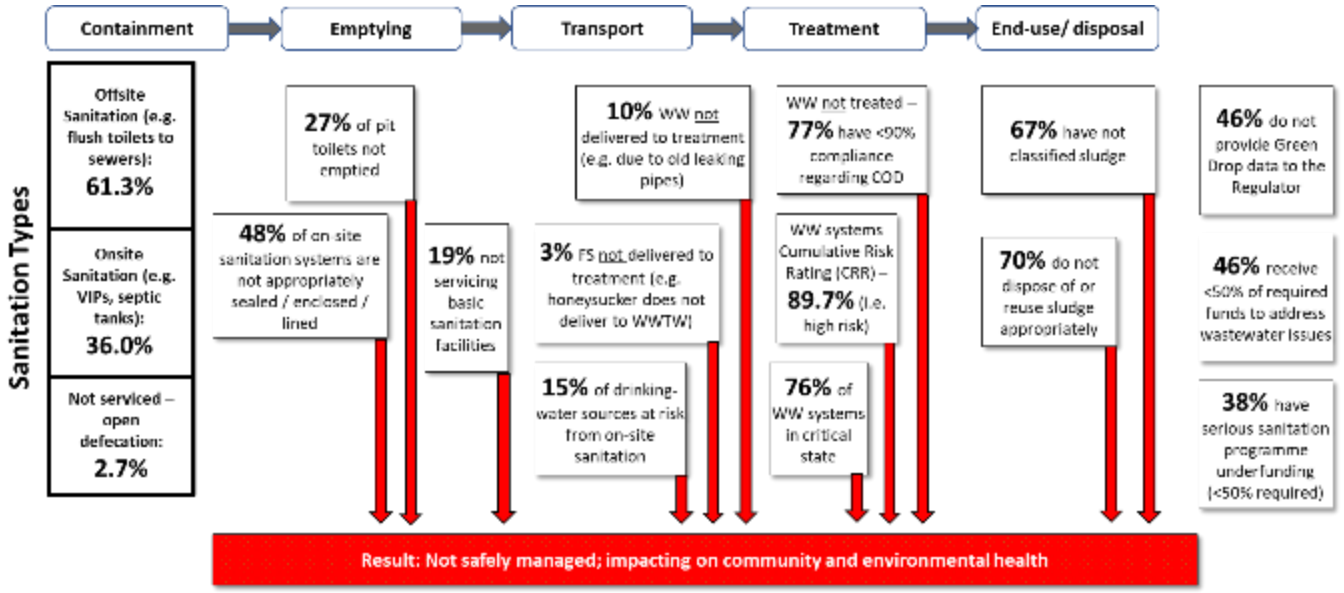


FIGURE 9-8: 1ST ORDER SFD: NORTHERN CAPE

9.7 Sanitation status along the service chain

A total of 15 indicators were selected and analysed to assess the status of the sanitation service chain, focusing on the quality of available data. This includes three indicators for each of the four service chain components, plus three additional indicators addressing institutional aspects. The analysis results for the Northern Cape, obtained from the situational analysis tool developed as part of the NSIP Project, are presented visually in Figure 9-9 to Figure 9-11. The colour coding used in the analysis indicates effectiveness levels based on predefined scoring criteria. Green signifies that systems are functioning well and meeting expectations, while amber indicates average performance with identified areas for improvement. In contrast, red highlights poor performance or significant issues that require immediate attention (refer to Appendix B of the Monitoring Framework and Guide for detailed scoring rules). The visual representation in Figure 10-9 provides a comprehensive overview of the sanitation status along the service chain for all provinces in the country, allowing for quick and easy assessment at a glance.

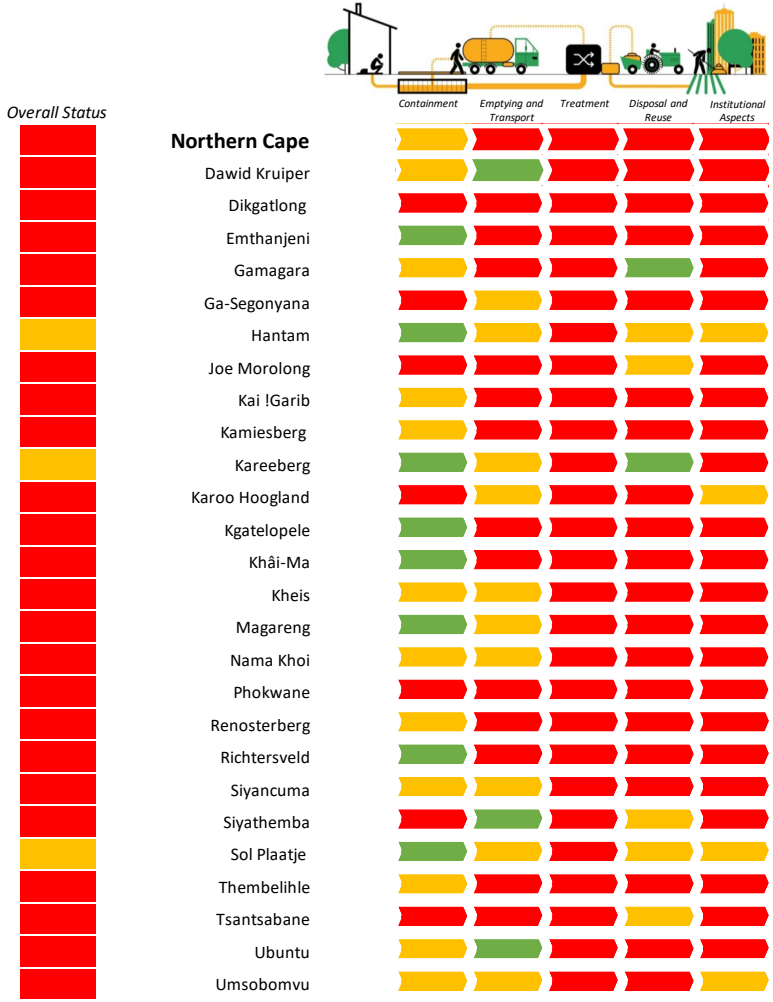


FIGURE 9-9: OVERVIEW OF SANITATION STATUS ALONG THE SERVICE CHAIN FOR WSAS IN TEH NORTHERN CAPE

Overall score	
>75%	Good
50%-75%	Average
<50%	Poor

- The performance of the Northern Cape and most WSAs falls short of the desired standard, with just three WSAs (Hantam, Kareeberg and Sol Plaatjie) achieving an ‘average’ overall status.
- Containment appears to be adequately managed for most WSAs, although some still exhibit poor performance in this regard.
- Notable pockets of good performance are observed in emptying and transport, as well as disposal and reuse efforts.
- All WSAs scored poorly in treatment practices.
- The health of the sanitation service chain is far from ideal, with institutional aspects predominantly categorised as 'poor' across most WSAs. Only four WSAs (Hantam, Karoo Hoogland, Sol Plaatjie and Umsobomvu) manage to attain an 'average' status in this regard.
- A considerable amount of work still needs to be done to enhance sanitation in the Northern Cape.

9.7.1 Heat map: Northern Cape

The heat map further highlights key deficiencies in the sanitation service chain

The results of the analysis of the 15 indicators are represented for all the WSAs in the Northern Cape in the heat map in Figure 9-10. Green signifies that systems are functioning well and meeting the expectations defined by the scoring criteria. Amber indicates average performance, suggesting areas that require improvement, while red highlights poor performance or significant issues that require immediate attention. Although there are pockets of good performance, overall, the performance is far from ideal.

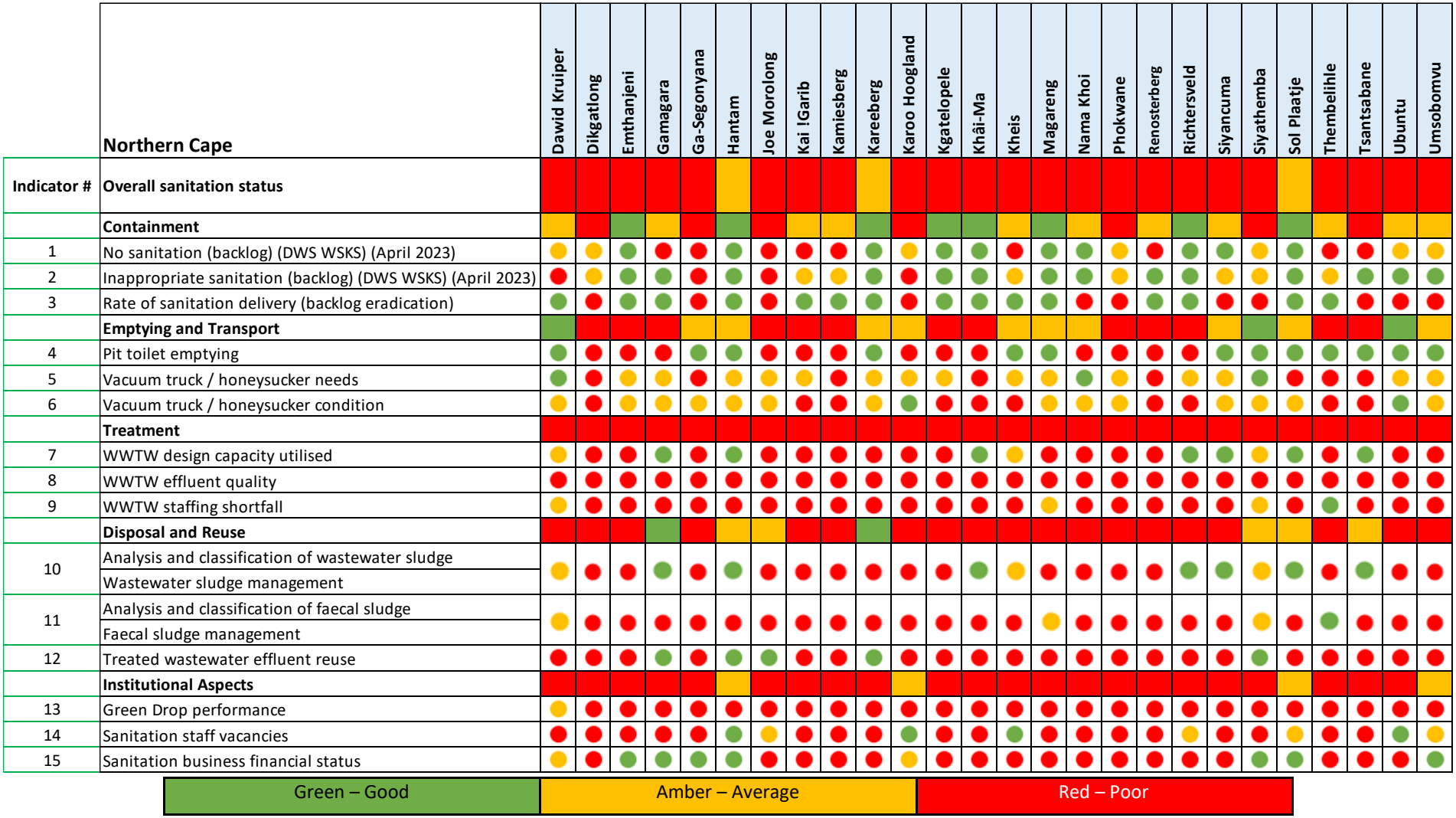


FIGURE 9-10: HEAT MAP SHOWING THE STATUS OF THE 15 INDICATORS FOR WSAS IN THE NORTHERN CAPE

9.7.2 Rating WSAs in the Northern Cape: Sanitation service chain elements

The performance of each of the 15 indicators of the sanitation service chain highlights key deficiencies at WSAs

Using the heat map and total scores of the 15 indicators, each WSA in the Northern Cape is ranked from poorest-performing on the left to best-performing on the right, as shown in Figure 9-11. WSAs facing significant challenges across the sanitation service chain, including related institutional factors, are marked mostly in red, starting on the far left, while those that are performing well are indicated mostly in green, moving towards the far right.

The 15 sanitation service chain elements that are rated are indicated below:

	Containment
1.	No sanitation (backlog)
2.	Inappropriate sanitation (backlog)
3.	Rate of sanitation delivery (years to eradicate backlog)
	Emptying and transport
4.	Pit toilet emptying
5.	Vacuum truck/honeysucker needs
6.	Vacuum truck/honeysucker condition
	Treatment
7.	WWTW design capacity utilised
8.	WWTW effluent quality
9.	WWTW staffing shortfall
	Disposal and reuse
10.	Analysis and classification of wastewater sludge
	Wastewater sludge management
11.	Analysis and classification of FS
	FSM
12.	Treated wastewater effluent reuse
	Institutional aspects
13.	Green Drop performance (2021)
14.	Sanitation staff vacancies
15.	Sanitation business financial status

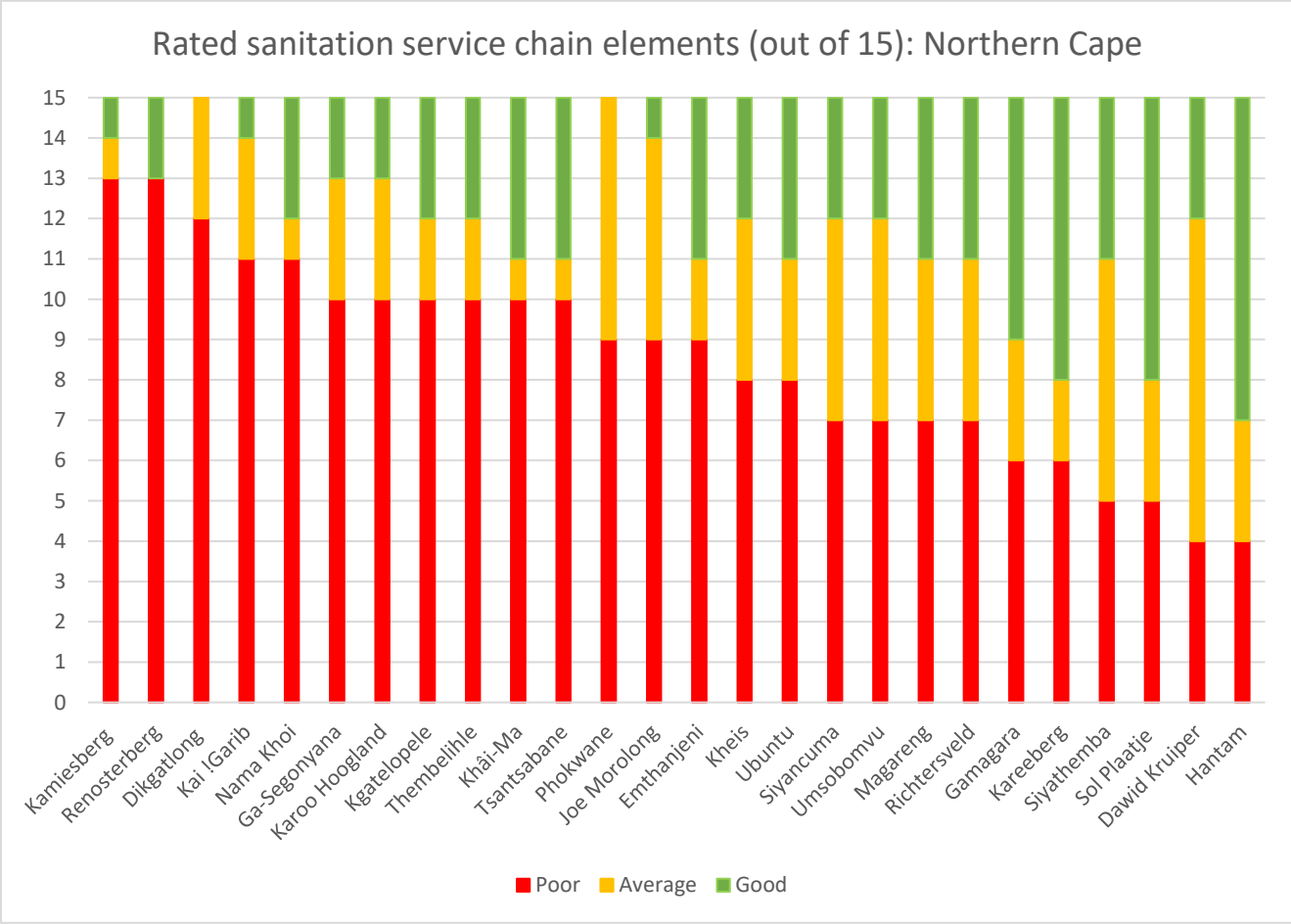


FIGURE 9-11: RATED WSAS IN NORTHERN CAPE BASED ON THE PERFORMANCE OF THE 15 INDICATORS (LEFTMOST COLUMN = POOREST PERFORMER; RIGHTMOST COLUMN = BEST PERFORMER)

9.8 Key findings: Northern Cape

Is the Northern Cape's sanitation in good health?

The analysis below provides a snapshot of the Northern Cape's sanitation status as of 2022/23.

Overall

The sanitation status of the province can be categorised as 'poor'.

Access to sanitation/Containment

The Northern Cape, while slightly less urbanised than provinces such as the Western Cape, Free State, and Gauteng, also has a relatively high urban population, with 77% of households in urban areas and 23% in rural areas. Overall, a relatively large percentage (69%) of households in the province are connected to the sewer system, while 28% rely on on-site sanitation. Additionally, 4% of the households have no access to sanitation facilities. Consistent with the general trend across South Africa, urban areas in the Free State have better access to sewered systems, with 77% of urban households connected to the sewer network. In rural areas, 42% of households have sewer connections, while 52% rely on-site sanitation systems. This indicates slightly better access to sewer systems in the province's rural areas compared to some other provinces.

Bucket and chemical toilets

Although the use of bucket toilets has declined since 2017, over 11 000 households in the province continue to rely on bucket toilets. In contrast, while the number of households using chemical toilets remains among the lowest in the country, it has gradually increased since 2017, with more than 8 000 households served by chemical toilets as of 2023 (DWS, 2023b). The continued use of bucket toilets and the increasing reliance on chemical toilets contribute to the ongoing 'inappropriate sanitation' backlog across WSAs in the province. These types of sanitation solutions, while providing a temporary alternative, do not meet the standards of more permanent and hygienic sanitation infrastructure.

Sanitation backlog

Some Northern Cape WSAs could potentially meet sector targets by 2030 (e.g. SDG 6.2). Seven WSAs (Hantam, Kai !Garib, Kareeberg, Kgatelopele, Khâi-Ma, Kheis, Renosterberg) have already eradicated their sanitation backlogs. Nine WSAs (Gamagara, Ga-Segonyana, Joe Morolong, Kai !Garib, Kamiesberg, Kheis, Renosterberg, Thembelihle, Tsantsabane) have a 'no service' backlog exceeding 5%, which is categorised as 'poor'. Four WSAs (Dawid Kruiper, Ga-Segonyana, Joe Morolong, Karoo Hoogland) have an 'inappropriate sanitation' backlog exceeding 20%, also categorised as 'poor'. Given the current rate of sanitation delivery (years to eradicate backlog), it is highly unlikely that 11 WSAs (Dikgatlong, Ga-Segonyana, Joe Morolong, Karoo Hoogland, Nama Khoi, Phokwane, Siyancuma, Siyathemba, Tsantsabane, Ubuntu, Umsobomvu) will eradicate their backlog by 2030.

Emptying and transport

Thirteen WSAs (Dikgatlong, Emthanjeni, Gamagara, Joe Morolong, Kai !Garib, Kamiesberg, Karoo Hoogland, Kgatelopele, Khâi-Ma, Nama Khoi, Phokwane, Renosterberg, Richtersveld) indicated that they do not empty pits. This means that users need to empty their own pits, dig their own new pits, or resort to other means. WSAs need to ensure that users are aware of appropriate safety and hygiene measures to follow. Eight WSAs (Dikgatlong, Ga-Segonyana, Kamiesberg, Khâi-Ma, Renosterberg, Sol Plaatje, Thembelihle, Tsantsabane) indicated that they have a significant shortage of vacuum trucks and honeysuckers with their need exceeding 100% of their current fleet (i.e. they need to at least double their fleet). This result also seems to indicate that pit-emptying could currently be limited by the number of vacuum trucks and honeysuckers available. Furthermore, the condition of some of the existing vacuum trucks and honeysuckers is far from ideal, with 10 WSAs (Dikgatlong, Kai !Garib, Kamiesberg, Kgatelopele, Khâi-Ma, Kheis, Renosterberg, Richtersveld, Thembelihle, Tsantsabane) indicating that they are in poor condition. This implies that breakdowns are inevitable and indicates a further vulnerability in emptying and transport.

Treatment

Sixteen WSAs (Dikgatlong, Emthanjeni, Ga-Segonyana, Joe Morolong, Kai !Garib, Kamiesberg, Kareeberg, Karoo Hoogland, Kgatelopele, Magareng, Nama Khoi, Phokwane, Renosterberg, Thembelihle, Ubuntu, Umsobomvu) have WWTWs where the design capacity exceeds 90% utilisation. This implies that the WWTWs will struggle to effectively treat incoming effluent flows. The overall WWTWs performance for all 26 WSAs is far from ideal, with all WSAs (Dawid Kruiper, Dikgatlong, Emthanjeni, Gamagara, Ga-Segonyana, Hantam, Joe Morolong, Kai !Garib, Kamiesberg, Kareeberg, Karoo Hoogland, Kgatelopele, Khâi-Ma, Kheis, Magareng, Nama Khoi, Phokwane, Renosterberg, Richtersveld, Siyancuma, Siyathemba, Sol Plaatje, Thembelihle, Tsantsabane,

Ubuntu, Umsobomvu) having a treated effluent quality with an overall compliance of less than 50%. Most WSAs indicated a significant challenge with WWTW staffing, with 22 WSAs (Dikgatlong, Emthanjeni, Gamagara, Ga-Segonyana, Hantam, Joe Morolong, Kai !Garib, Kamiesberg, Kareeberg, Karoo Hoogland, Kgatelopele, Khâi-Ma, Kheis, Nama Khoi, Phokwane, Renosterberg, Richtersveld, Siyancuma, Sol Plaatje, Tsantsabane, Ubuntu, Umsobomvu) indicating an overall WWTW staffing shortfall greater than 35%. This could contribute to the noted performance challenges.

Disposal and reuse

Sixteen WSAs (Dikgatlong, Emthanjeni, Hantam, Kai !Garib, Kamiesberg, Karoo Hoogland, Kgatelopele, Khâi-Ma, Kheis, Magareng, Nama Khoi, Renosterberg, Siyathemba, Thembelihle, Ubuntu, Umsobomvu) scored poorly for wastewater sludge management as they do not analyse and classify their wastewater sludge and/or do not proactively manage their sludge end-use or disposal. Five WSAs (Emthanjeni, Kamiesberg, Karoo Hoogland, Nama Khoi, Renosterberg) scored poorly for FSM as they do not analyse and classify their FS and/or do not proactively manage their FS end-use or disposal. Despite this, it is noted that 17 WSAs co-treat FS at their WWTWs. This could also be contributing to the poor performance noted. Twenty-one WSAs (Dawid Kruiper, Dikgatlong, Emthanjeni, Ga-Segonyana, Kai !Garib, Kamiesberg, Karoo Hoogland, Kgatelopele, Khâi-Ma, Kheis, Magareng, Nama Khoi, Phokwane, Renosterberg, Richtersveld, Siyancuma, Sol Plaatje, Thembelihle, Tsantsabane, Ubuntu, Umsobomvu) do not reuse treated wastewater effluent for any purpose. This lack of reuse could be because of the poor quality of treated effluent.

Institutional aspects

Almost all WSAs do not perform well in Green Drop, with 25 WSAs (Dikgatlong, Emthanjeni, Gamagara, Ga-Segonyana, Hantam, Joe Morolong, Kai !Garib, Kamiesberg, Kareeberg, Karoo Hoogland, Kgatelopele, Khâi-Ma, Kheis, Magareng, Nama Khoi, Phokwane, Renosterberg, Richtersveld, Siyancuma, Siyathemba, Sol Plaatje, Thembelihle, Tsantsabane, Ubuntu, Umsobomvu) having a very poor Green Drop performance score of less than 50%. 18 WSAs (Dawid Kruiper, Dikgatlong, Emthanjeni, Gamagara, Ga-Segonyana, Kai !Garib, Kamiesberg, Kareeberg, Kgatelopele, Khâi-Ma, Magareng, Nama Khoi, Phokwane, Renosterberg, Siyancuma, Siyathemba, Thembelihle, Tsantsabane) have significant sanitation staff challenges with sanitation staff vacancies of more than 35%. Seventeen WSAs (Dikgatlong, Joe Morolong, Kai !Garib, Kamiesberg, Kareeberg, Kgatelopele, Khâi-Ma, Kheis, Magareng, Nama Khoi, Phokwane, Renosterberg, Richtersveld, Siyancuma, Thembelihle, Tsantsabane, Ubuntu) indicated that the financial status of their sanitation business is far from ideal and is running at a deficit.

Photo: Patrick Federi on Unsplash

10 Situational analysis: North West

Section 10 provides a summary of data and findings from the **North West Situational Analysis** report.

For access to the full report, scan the QR code above.

What is the current reality in the province?

10.1 North West overview

Water services authorities

WSAs are responsible for supplying both water and sanitation services to households in their area of jurisdiction. In North West, there are:

- 4 district municipalities
- 18 local municipalities
- 10 WSAs

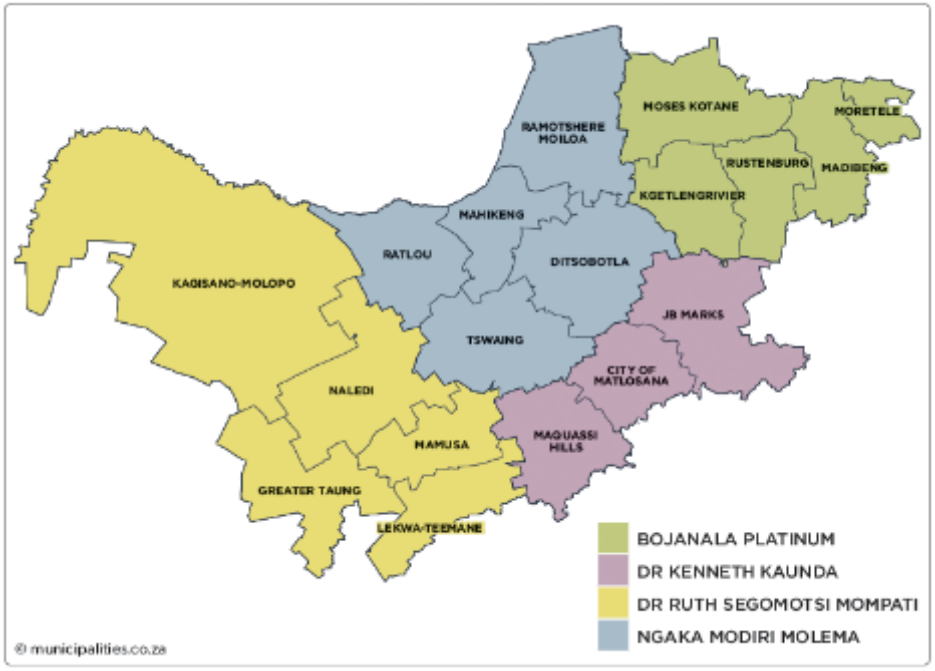


FIGURE 10-1: MUNICIPALITIES AND WSAS IN NORTH WEST

District municipalities
Bojanala Platinum
Dr Kenneth Kaunda
Dr Ruth Segomotsi Mompati*
Ngaka Modiri Molema*

Local municipalities	
Kgetlengrivier*	Kagisano-Molopo
Madibeng*	Lekwa-Teemane
Moretele*	Mamusa
Moses Kotane*	Naledi
Rustenburg*	Ditsobotla
City of Matlosana*	Mahikeng
JB Marks*	Ramotshere Moiloa
Maquassi Hills*	Ratlou
Greater Taung	Tswaing

(* indicates WSA)

10.2 Access to sanitation: Households

Sanitation service levels per household: A provincial view

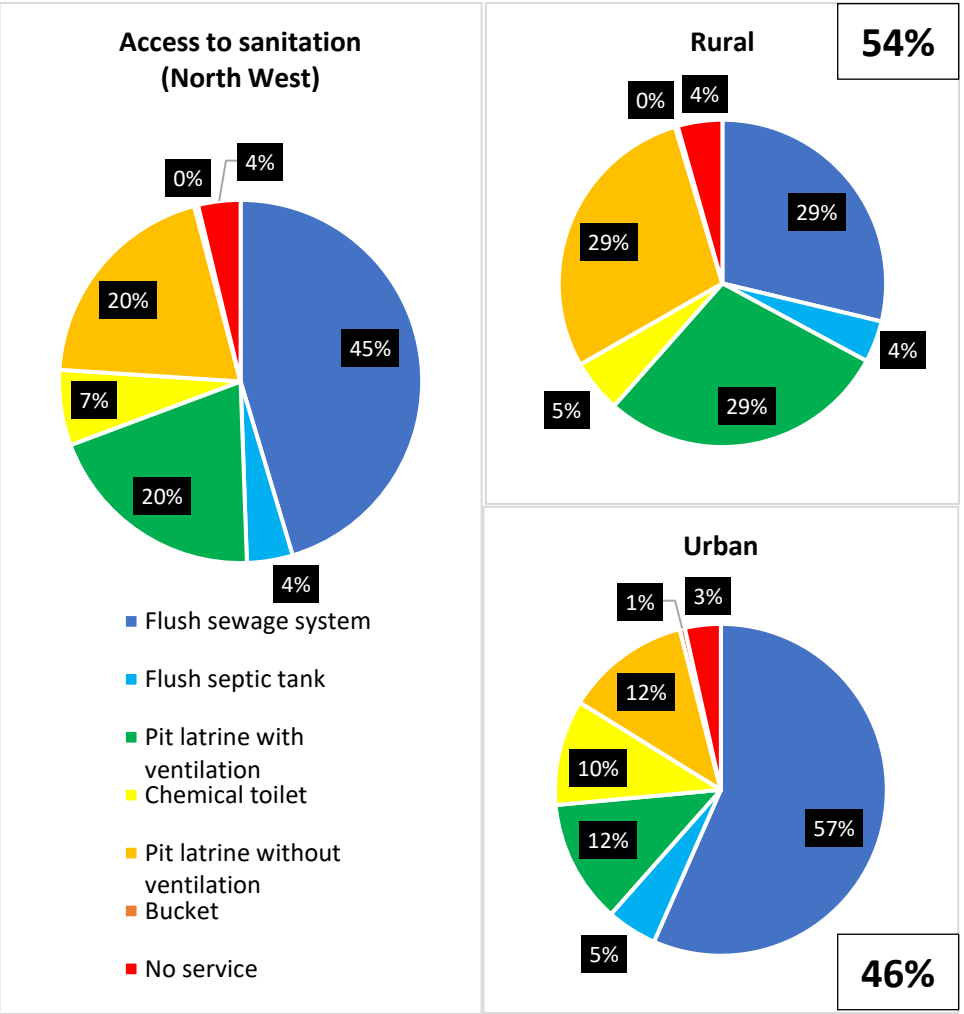


FIGURE 10-2: SANITATION SERVICE LEVELS PER HOUSEHOLD IN NORTH WEST

An analysis of sanitation provision by settlement type (see Figure 10-2 and Table 10-1) depicts a total number of 1 512 417 households in North West, of which 810 200 (54%) are rural settlements and 702 217 (46%) urban settlements (DWS, 2022b).

The data shows that provincially:

- **45%** of households have access to a flush toilet connected to the sewage system.
- **4%** of households do not have access to sanitation (implying open defecation).
- The remaining **51%** of households utilise some form of on-site sanitation system, including septic tanks (4%), pit latrines with ventilation (i.e. VIPs) (20%), chemical toilets (7%), pit latrines without ventilation (20%) and bucket latrines (0%).

In rural settlements:

- **29%** of households have access to a flush toilet connected to the sewage system.
- **4%** of households do not have access to sanitation (implying open defecation).
- The remaining **67%** of households utilise some form of on-site sanitation system, including septic tanks (4%), pit latrines with ventilation (i.e. VIPs) (29%), chemical toilets (5%), pit latrines without ventilation (29%) and bucket latrines (0%).

In urban settlements:

- **57%** of households have access to a flush toilet connected to the sewage system.
- **3%** of households do not have access to sanitation (implying open defecation).
- The remaining **40%** of households utilise some form of on-site sanitation system, including septic tanks (5%), pit latrines with ventilation (i.e. VIPs) (12%), chemical toilets (10%), pit latrines without ventilation (12%) and bucket latrines (1%).

The analysis of sanitation provision by settlement type at the WSA level in North West is depicted in Figure 10-3 and detailed in Table 10-1.

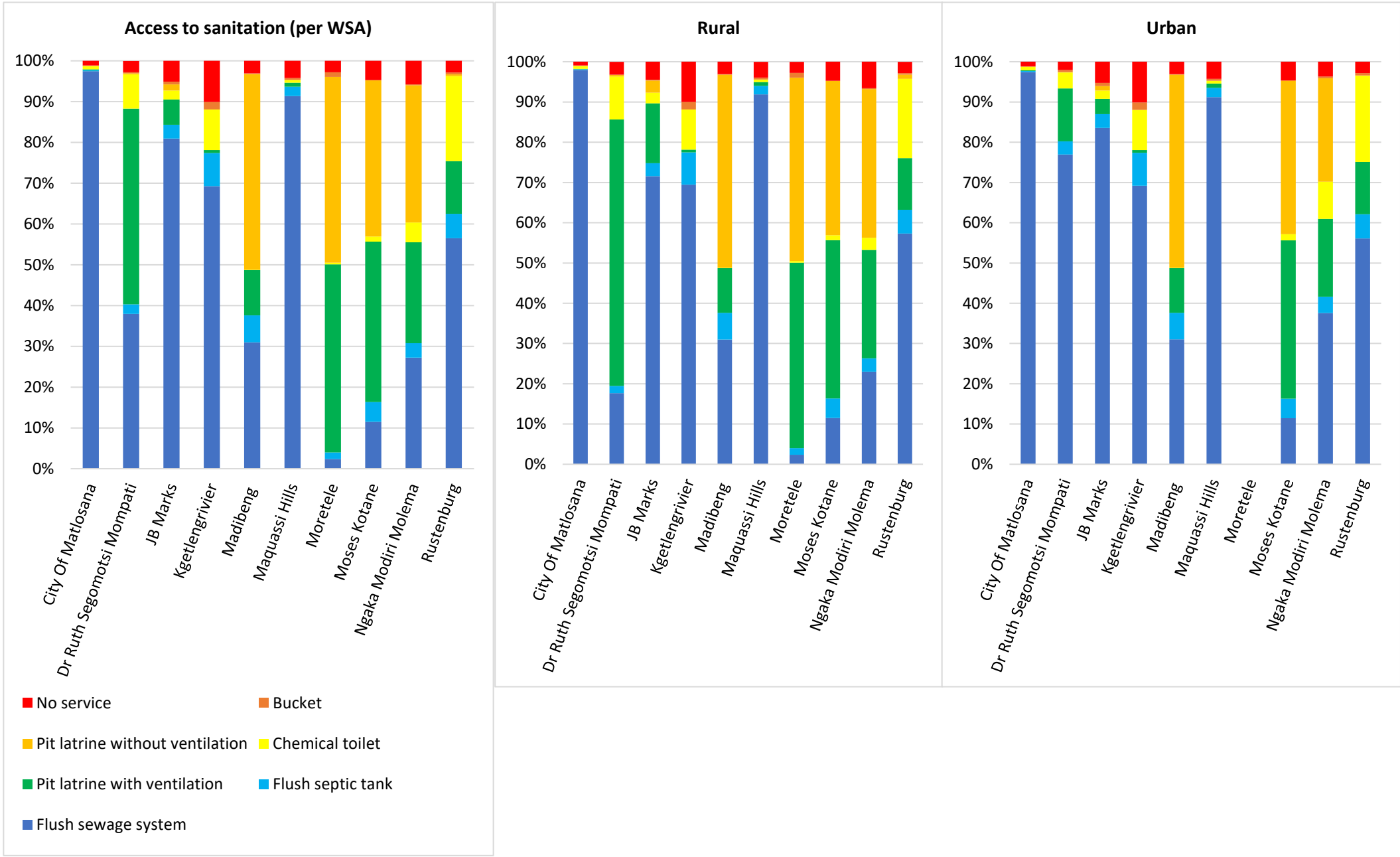


FIGURE 10-3: SANITATION SERVICE LEVELS PER HOUSEHOLD IN 10 WSAS IN NORTH WEST

TABLE 10-1: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN NORTH WEST

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
City Of Matlosana	159 666		155 584	97	476	0	284	0	1 339	1	0	0	188	0	1 789	1
Rural	148 245	93	144 399	97	455	0	270	0	1 257	1	0	0	178	0	1 681	1
Urban	11 421	7	11 185	98	21	0	14	0	82	1	0	0	10	0	108	1
Dr Ruth Segomotsi Mompati	149 361		56 707	38	3 478	2	71 693	48	12 514	8	404	0	400	0	4 112	3
Rural	98 187	66	17 342	18	1 789	2	64 959	66	10 488	11	372	0	112	0	3 073	3
Urban	51 174	34	39 365	77	1 689	3	6 734	13	2 026	4	32	0	288	1	1 039	2
JB Marks	94 645		76 628	81	3 199	3	5 867	6	2 046	2	1 457	2	622	1	4 829	5
Rural	20 350	22	14 567	72	649	3	3 036	15	534	3	613	3	42	0	911	4
Urban	74 295	78	62 061	84	2 550	3	2 831	4	1 512	2	844	1	580	1	3 918	5
Kgetlengrivier	22 069		15 291	69	1 793	8	157	1	2 199	10	0	0	404	2	2 224	10
Rural	8 902	40	6 183	69	715	8	62	1	886	10	0	0	163	2	892	10
Urban	13 167	60	9 108	69	1 078	8	95	1	1 313	10	0	0	241	2	1 332	10
Madibeng	227 165		70 372	31	15 093	7	25 192	11	211	0	108 984	48	312	0	7 001	3
Rural	148 071	65	45 841	31	9 865	7	16 414	11	139	0	71 053	48	204	0	4 552	3
Urban	79 094	35	24 531	31	5 228	7	8 778	11	72	0	37 931	48	108	0	2 449	3
Maquassi Hills	28 288		25 843	91	644	2	285	1	192	1	0	0	133	0	1 188	4
Rural	6 248	22	5 740	92	133	2	59	1	40	1	0	0	28	0	247	4
Urban	22 040	78	20 103	91	511	2	226	1	152	1	0	0	105	0	941	4
Moretele	65 506		1 566	2	1 049	2	30 206	46	280	0	29 817	46	757	1	1 821	3
Rural	65 506	100	1 566	2	1 049	2	30 206	46	280	0	29 817	46	757	1	1 821	3
Urban	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moses Kotane	94 452		10 852	11	4 577	5	37 177	39	1 142	1	36 180	38	40	0	4 482	5
Rural	87 719	93	10 082	11	4 250	5	34 530	39	1 038	1	33 609	38	40	0	4 168	5
Urban	6 733	7	770	11	327	5	2 647	39	104	2	2 571	38	0	0	314	5
Ngaka Modiri Molema	362 783		98 875	27	12 840	4	89 668	25	17 530	5	122 138	34	873	0	20 837	6
Rural	256 765	71	59 040	23	8 538	3	69 161	27	7 762	3	94 880	37	423	0	16 941	7
Urban	106 018	29	39 835	38	4 302	4	20 507	19	9 768	9	27 258	26	450	0	3 896	4
Rustenburg	308 482		174 377	57	18 471	6	39 843	13	64 265	21	1 242	0	1 545	1	8 723	3
Rural	107 031	35	61 316	57	6 352	6	13 731	13	21 095	20	1 084	1	440	0	2 998	3
Urban	201 451	65	113 061	56	12 119	6	26 112	13	43 170	21	158	0	1 105	1	5 725	3
North West	**1 512 417**		**686 095**	**45**	**61 620**	**4**	**300 372**	**20**	**101 718**	**7**	**300 222**	**20**	**5 274**	**0**	**57 006**	**4**
Rural	**810 200**	**54**	**232 862**	**29**	**33 361**	**4**	**232 172**	**29**	**42 344**	**5**	**231 428**	**29**	**2 219**	**0**	**35 711**	**4**
Urban	**565 393**	**37**	**320 019**	**57**	**27 825**	**5**	**67 944**	**12**	**58 199**	**10**	**68 794**	**12**	**2 887**	**1**	**19 722**	**3**

10.3 Bucket and chemical toilets in North West

Are bucket toilets still in use?

Bucket toilets should have already been eradicated in South Africa. Yet, as of 2023, there are still more than 5 000 households in North West using bucket toilets (DWS, 2023b), as illustrated in Figure 10-4.

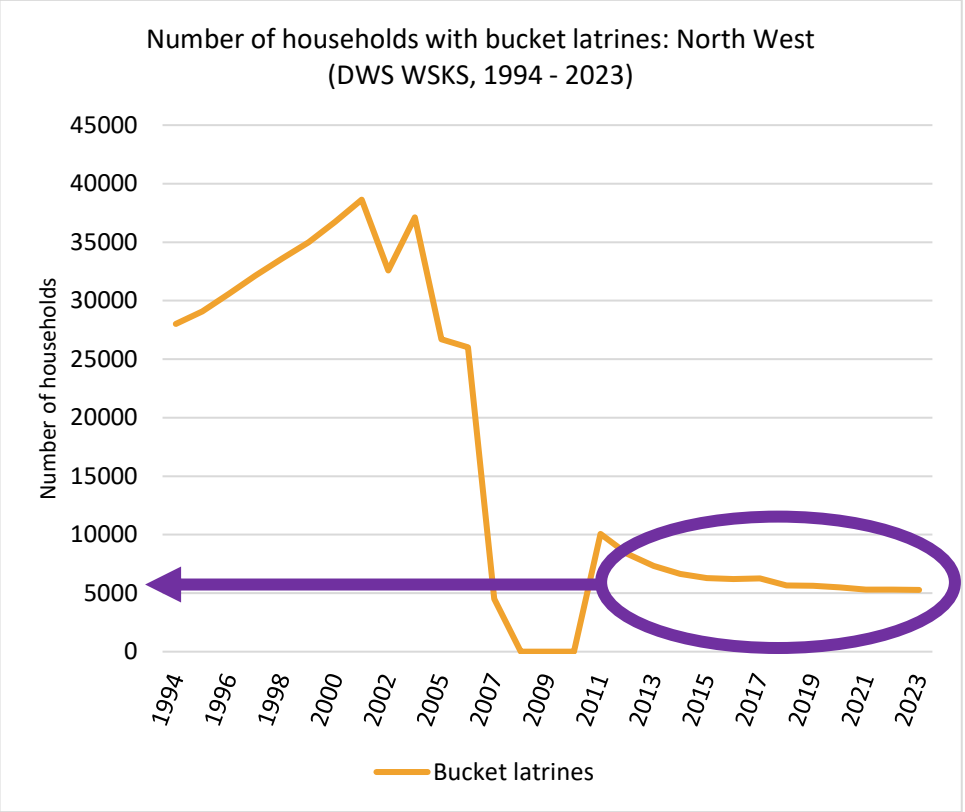


FIGURE 10-4: NUMBER OF HOUSEHOLDS WITH BUCKET LATRINES IN NORTH WEST FROM 1994 TO 2023

Are chemical toilets an issue?

Currently, more than 101 000 households in North West are served by chemical toilets (DWS, 2023b), as illustrated in Figure 10-5. Can the province afford this?

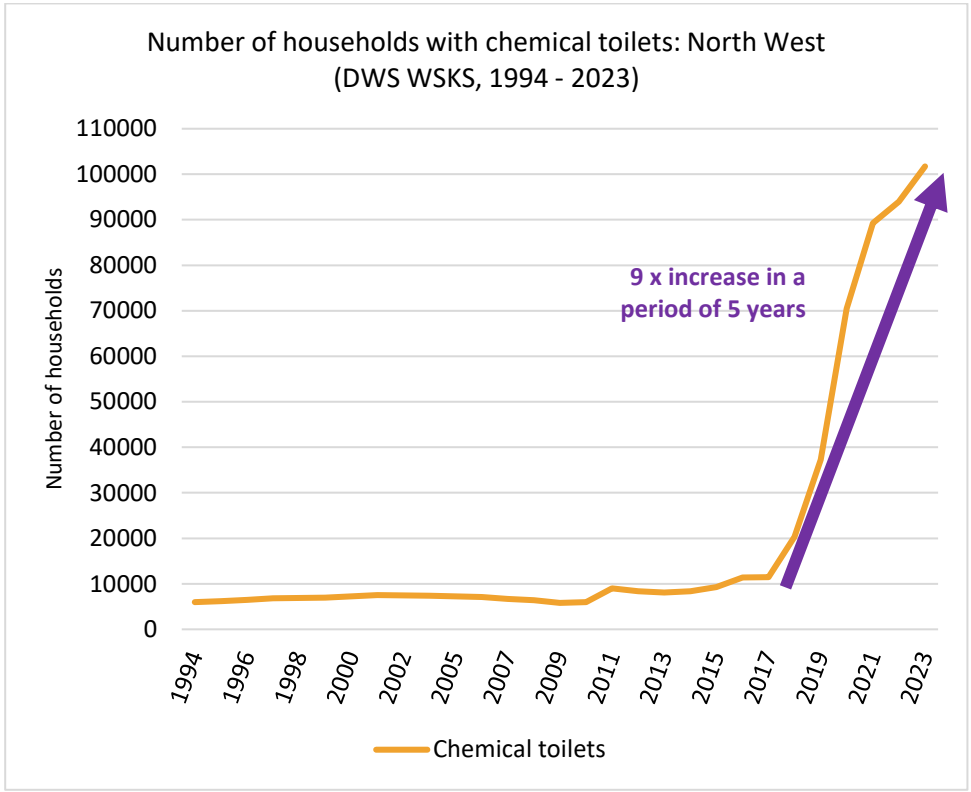


FIGURE 10-5: NUMBER OF HOUSEHOLDS WITH CHEMICAL TOILETS IN NORTH WEST FROM 1994 TO 2023

Assuming 2.5 households are served per chemical toilet (i.e. ~10 people per toilet, ~40 400 chemical toilets in operation), and chemical toilet rental costs of R750/month, this equates to a cost of **~R30 million/month** or **~R364 million/year**.

Could innovative sanitation alternatives meet the same needs (or perform even better) at a lower cost?

10.4 Progress on eradicating sanitation backlog

Is North West on target to eradicate sanitation backlogs?

Almost all WSAs in North West have significant overall backlog (i.e. inappropriate sanitation systems and no sanitation systems). City of Matlosana, Maquassi Hills, and JB Marks are the only WSAs with relatively low sanitation backlogs (2%, 5% and 9% respectively). Figure 10-6 shows the percentage of appropriate, inappropriate and unacceptable sanitation for each WSA in North West, as well as the overall statistics for the province.

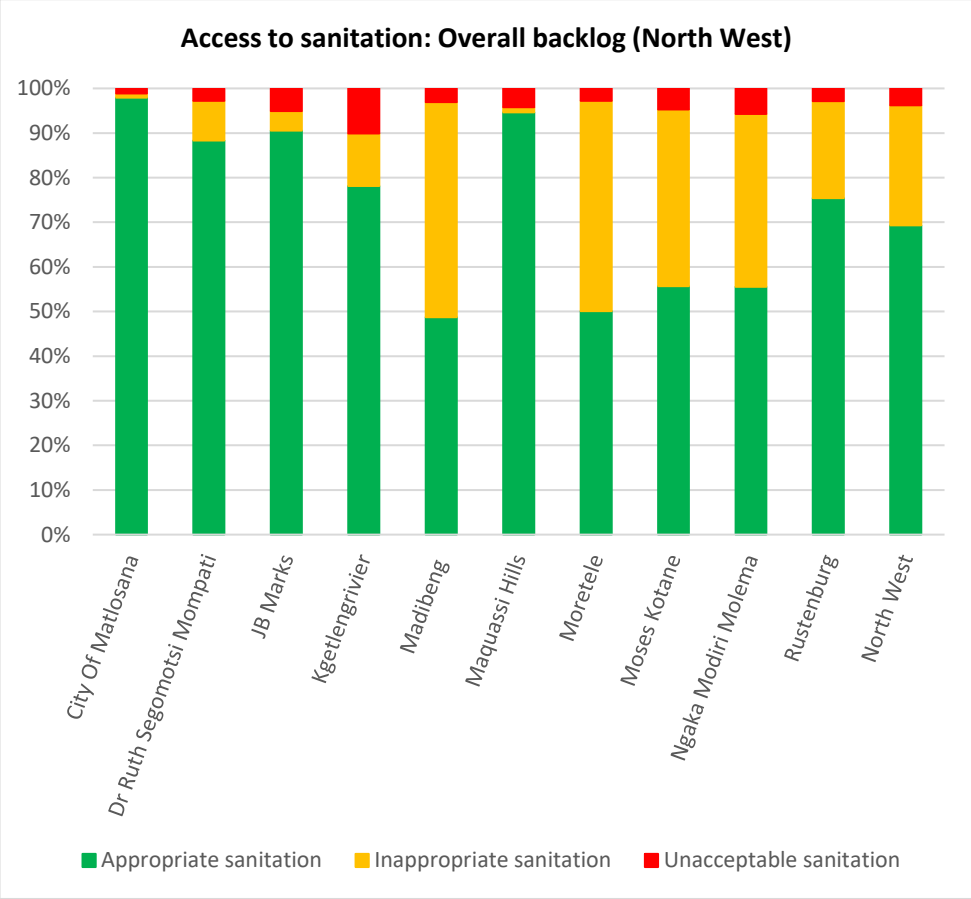


FIGURE 10-6: ACCESS TO SANITATION AND OVERALL BACKLOG IN NORTH WEST

TABLE 10-2: RATE OF SANITATION DELIVERY AND LIKELIHOOD OF WSAS IN NORTH WEST TO ACHIEVE BACKLOG ERADICATION

Rate of delivery (years to eradicate backlog) (as of 2021)	End date	Years to achieve
City of Matlosana	2020	-1 (i.e. achieved)
Dr Ruth Segomotsi Mompati	2020	-1 (i.e. achieved)
JB Marks	2051	30
Kgetlengrivier	2056	35
Madibeng	2088	67
Maquassi Hills	2025	4
Moretele	2032	11
Moses Kotane	2057	36
Ngaka Modiri Molema	2030	9
Rustenburg	2161	40

NOTE: The figures above were calculated in 2021. Has there been progress since then? Has the rate of sanitation service delivery (i) increased, (ii) stayed the same, or (iii) decreased? Understanding (a) sanitation backlog and (b) the rate of sanitation service delivery will help to determine if WSAs are on track to meet sanitation access-related SDGs.

From Table 10-2 above:

- 2 WSAs have already eradicated their backlog (blue).
- 2 WSAs have a good chance of eradicating their backlog by 2030 (green).
- 1 WSA is likely to make progress but is likely to eradicate backlog only partially (yellow).
- 4 WSAs are not addressing their backlogs quickly enough and are unlikely to achieve backlog eradication.

10.5 Municipal sanitation status: North West

Where is North West doing well?

Although access to sanitation has improved since 1994 , the status of containment, emptying and transport and treatment has been categorised as 'poor' for the North West province. The status of disposal and reuse has also been categorised as 'poor' for the North West province. All components of the sanitation service chain are therefore categorised as 'poor'. It is not surprising that institutional aspects are also far from ideal. There appears to be little innovation or value add related to the sanitation sector in the province. Challenges are compounded by growing informal settlements. Unfortunately, there is much work to do to improve sanitation in the province.

water & sanitation
Department: Water and Sanitation
REPUBLIC OF SOUTH AFRICA

National Sanitation Integrated Plan

Provincial Status Report
North West

Provincial Status: Poor

National Status

Total Provinces
9

			Data Set (*indicates number of WSAs with data submitted*)
Context			
Population (DWS WSKS) (April 2023)	4182391		10 / 10
Number of households (DWS WSKS) (April 2023)	1512417 HH		10 / 10
Number of wastewater treatment works	48		10 / 10
Number of sewer pump stations	174		10 / 10
Length of sewer pipelines	2163 km		3 / 10
Containment		**Poor**	
1.1 No sanitation (backlog) (DWS WSKS) (April 2023)	4 % HH	Average	10 / 10
1.2 Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)	31 % HH	Poor	10 / 10
1.3 Average rate of sanitation delivery (years to eradicate backlog)	23 years	Poor	10 / 10
Emptying and Transport		**Poor**	
2.1 Sewer network condition	NI		0 / 10
2.2 Pit toilet emptying	30 % of WSAs	Poor	7 / 10
2.3 Vacuum truck / honeysucker needs	24 trucks	Poor	9 / 10
2.4 Vacuum truck / honeysucker condition	30 % in fair condition	Poor	5 / 10
Treatment		**Poor**	
3.1 % of wastewater treatment works design capacity utilised	25 %	Average	8 / 10
3.1.1 Design capacity	334.9 Ml/d		10 / 10
3.1.2 Available capacity	214.7 Ml/d		10 / 10
3.1.3 Operational capacity	132.7 Ml/d		8 / 10
3.2 Wastewater treatment works effluent quality	25 % compliance	Poor	10 / 10
3.2.1 Microbiological compliance	23 %		10 / 10
3.2.2 Chemical compliance	22 %		10 / 10
3.2.3 Physical compliance	30 %		10 / 10
3.3 Wastewater treatment works staffing shortfall	66 %	Poor	10 / 10
3.3.1 Number of supervisor(s): Compliant	19		10 / 10
3.3.2 Number of supervisor(s): Shortfall	32		10 / 10
3.3.3 Number of PC(s): Compliant	43		10 / 10
3.3.4 Number of PC(s): Shortfall	91		10 / 10
Disposal and Reuse		**Poor**	
4.1 Analysis and classification of wastewater sludge	40 % of WSAs	Poor	7 / 10
4.2 Wastewater sludge management	10 % acceptable practices		5 / 10
4.3 Analysis and classification of faecal sludge	0 % of WSAs	Poor	7 / 10
4.4 Faecal sludge management	60 % acceptable practices		6 / 10
4.5 Treated wastewater effluent reuse	30 % of WSAs	Poor	7 / 10
Institutional Aspects		**Poor**	
5.1 Green Drop performance (2021)	30 %	Poor	10 / 10
5.2 Sanitation staff vacancies	37 %	Poor	4 / 10
5.3 Sanitation business financial status	20 % of WSAs operate a deficit	Poor	3 / 10
5.4 Growing informal settlements	50 % of WSAs		6 / 10
5.5 Shit-flow diagrams developed for sanitation systems	10 % of WSAs		6 / 10
5.6 Alternative/innovative sanitation processes or technologies implemented	20 % of WSAs have implement multiple		10 / 10
5.6.1 Toilets	*10* % of WSAs		7 / 10
5.6.2 Emptying	*20* % of WSAs		7 / 10
5.6.3 Transport	*10* % of WSAs		7 / 10
5.6.4 Treatment	*20* % of WSAs		7 / 10
5.6.5 Disposal benefication	*10* % of WSAs		7 / 10
5.6.6 New business models	*10* % of WSAs		7 / 10

FIGURE 10-7: SANITATION STATUS IN NORTH WEST

10.6 1st order excreta flow diagram (SFD): North West

What are some of the contributors to poor sanitation performance?

The 1st order SFD for North West (Figure 10-8) highlights significant gaps in the sanitation service chain. These deficiencies all potentially have a negative impact on communities (e.g. water supply) and the environment (e.g. water sources).

Containment:

- Inappropriately constructed on-site sanitation systems

Emptying and transport:

- Lost sewage due to old and leaking pipes
- Inadequate maintenance and servicing of basic sanitation systems (e.g. not emptied)
- Lack of control of transportation of FS (no monitoring or management)

Treatment:

- Poorly operated, maintained and managed WWTWs resulting in poor performance or non-compliance

End-use or disposal:

- Inadequate sludge analysis and classification, and resultant inappropriate sludge disposal and/or non-beneficial use

Institutional:

- Inadequate sanitation systems or programme funding

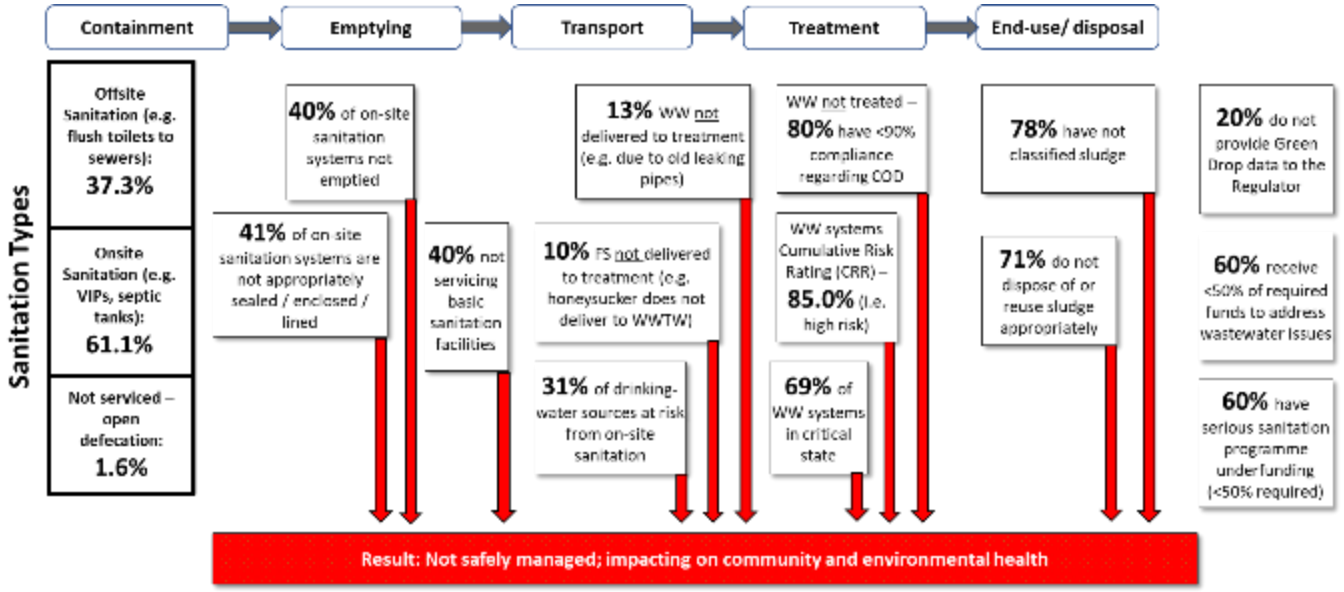
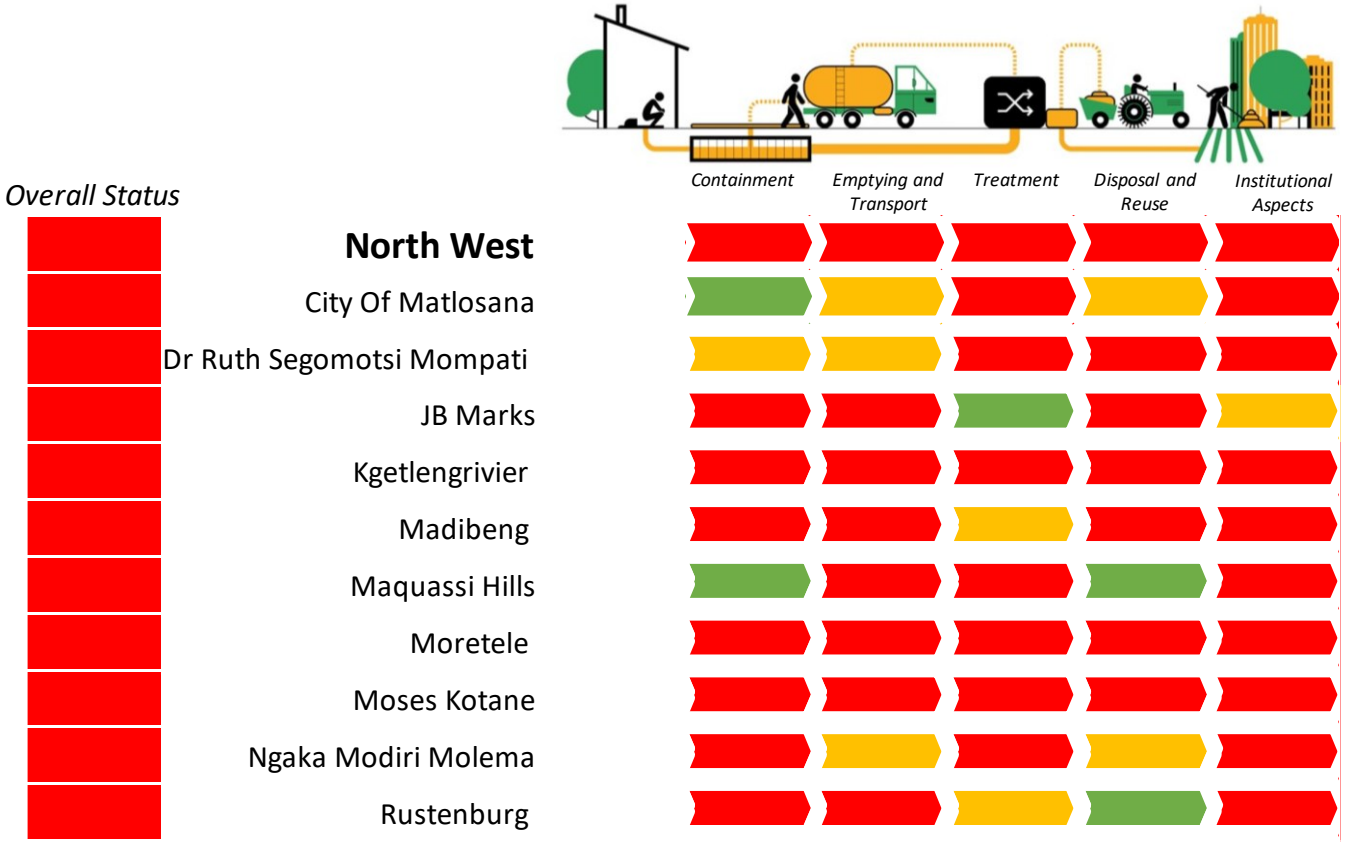


FIGURE 10-8: 1ST ORDER SFD: NORTH WEST

10.7 Sanitation status along the service chain

An analysis of the sanitation service chain shows there is much work to do

A total of 15 indicators were selected and analysed to assess the status of the sanitation service chain, focusing on the quality of available data. This includes three indicators for each of the four service chain components, plus three additional indicators addressing institutional aspects. The analysis results for North West, obtained from the situational analysis tool developed as part of the NSIP Project, are presented visually in Figure 10-9 to Figure 10-11. The colour coding used in the analysis indicates effectiveness levels based on predefined scoring criteria. Green signifies that systems are functioning well and meeting expectations, while amber indicates average performance with identified areas for improvement. In contrast, red highlights poor performance or significant issues that require immediate attention (refer to Appendix B of the Monitoring Framework and Guide for detailed scoring rules). The visual representation in Figure 10-9 provides a comprehensive overview of the sanitation status along the service chain for all provinces in the country, allowing for quick and easy assessment at a glance.



Overall score	
>75%	Good
50%-75%	Average
<50%	Poor

- Overall, the performance of North West and all WSAs is notably below the desired standard.
- Encouragingly, some pockets of good performance are observed in containment, treatment, and disposal and reuse practices.
- However, no WSAs exhibit satisfactory performance in emptying and transport, with the majority categorised as 'poor' and only three WSAs (City of Matlosana, Dr Ruth Segomotsi Mompati and Maquassi Hills) achieving an 'average' rating.
- The health of the sanitation service chain remains far from ideal, with institutional aspects predominantly categorised as 'poor' across most WSAs. Only one WSA (JB Marks) manages to attain an 'average' status in this regard.
- A significant amount of work still needs to be done to enhance sanitation practices in North West.

FIGURE 10-9: OVERVIEW OF SANITATION STATUS ALONG THE SERVICE CHAIN FOR WSAS IN NORTH WEST

10.7.1 Heat map: North West

The heat map further highlights key deficiencies in the sanitation service chain

The results of the analysis of the 15 indicators are represented for all the WSAs in North West in the heat map in Figure 10-10. Green signifies that systems are functioning well and meeting the expectations defined by the scoring criteria. Amber indicates average performance, suggesting areas that require improvement, while red highlights poor performance or significant issues that require immediate attention. Although there are pockets of good performance, overall, the performance is far from ideal.

	North West	City Of Matlosana	Dr Ruth Segomotsi Mompati	JB Marks	Kgetlengrivier	Madibeng	Maquassi Hills	Moretele	Moses Kotane	Ngaka Modiri Molema	Rustenburg
Indicator #	**Overall sanitation status**										
	Containment										
1	No sanitation (backlog) (DWS WSKS) (April 2023)										
2	Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)										
3	Rate of sanitation delivery (backlog eradication)										
	Emptying and Transport										
4	Pit toilet emptying										
5	Vacuum truck / honeysucker needs										
6	Vacuum truck / honeysucker condition										
	Treatment										
7	WWTW design capacity utilised										
8	WWTW effluent quality										
9	WWTW staffing shortfall										
	Disposal and Reuse										
10	Analysis and classification of wastewater sludge Wastewater sludge management										
11	Analysis and classification of faecal sludge Faecal sludge management										
12	Treated wastewater effluent reuse										
	Institutional Aspects										
13	Green Drop performance										
14	Sanitation staff vacancies										
15	Sanitation business financial status										

Green – Good | Amber – Average | Red – Poor

FIGURE 10-10: HEAT MAP SHOWING THE STATUS OF THE 15 INDICATORS FOR WSAS IN NORTH WEST

10.7.2 Rating WSAs in North West: Sanitation service chain elements

The performance of each of the 15 indicators of the sanitation service chain highlights key deficiencies at WSAs

Using the heat map and total scores of the 15 indicators, each WSA in North West is ranked from poorest-performing on the left to best-performing on the right, as shown in Figure 10-11. WSAs facing significant challenges across the sanitation service chain, including related institutional factors, are marked mostly in red, starting on the far left, while those that are performing well are indicated mostly in green, moving towards the far right.

The 15 sanitation service chain elements that are rated are indicated below:

	Containment
1.	No sanitation (backlog)
2.	Inappropriate sanitation (backlog)
3.	Rate of sanitation delivery (years to eradicate backlog)
	Emptying and transport
4.	Pit toilet emptying
5.	Vacuum truck/honeysucker needs
6.	Vacuum truck/honeysucker condition
	Treatment
7.	WWTW design capacity utilised
8.	WWTW effluent quality
9.	WWTW staffing shortfall
	Disposal and reuse
10.	Analysis and classification of wastewater sludge
	Wastewater sludge management
11.	Analysis and classification of FS
	FSM
12.	Treated wastewater effluent reuse
	Institutional aspects
13.	Green Drop performance (2021)
14.	Sanitation staff vacancies
15.	Sanitation business financial status

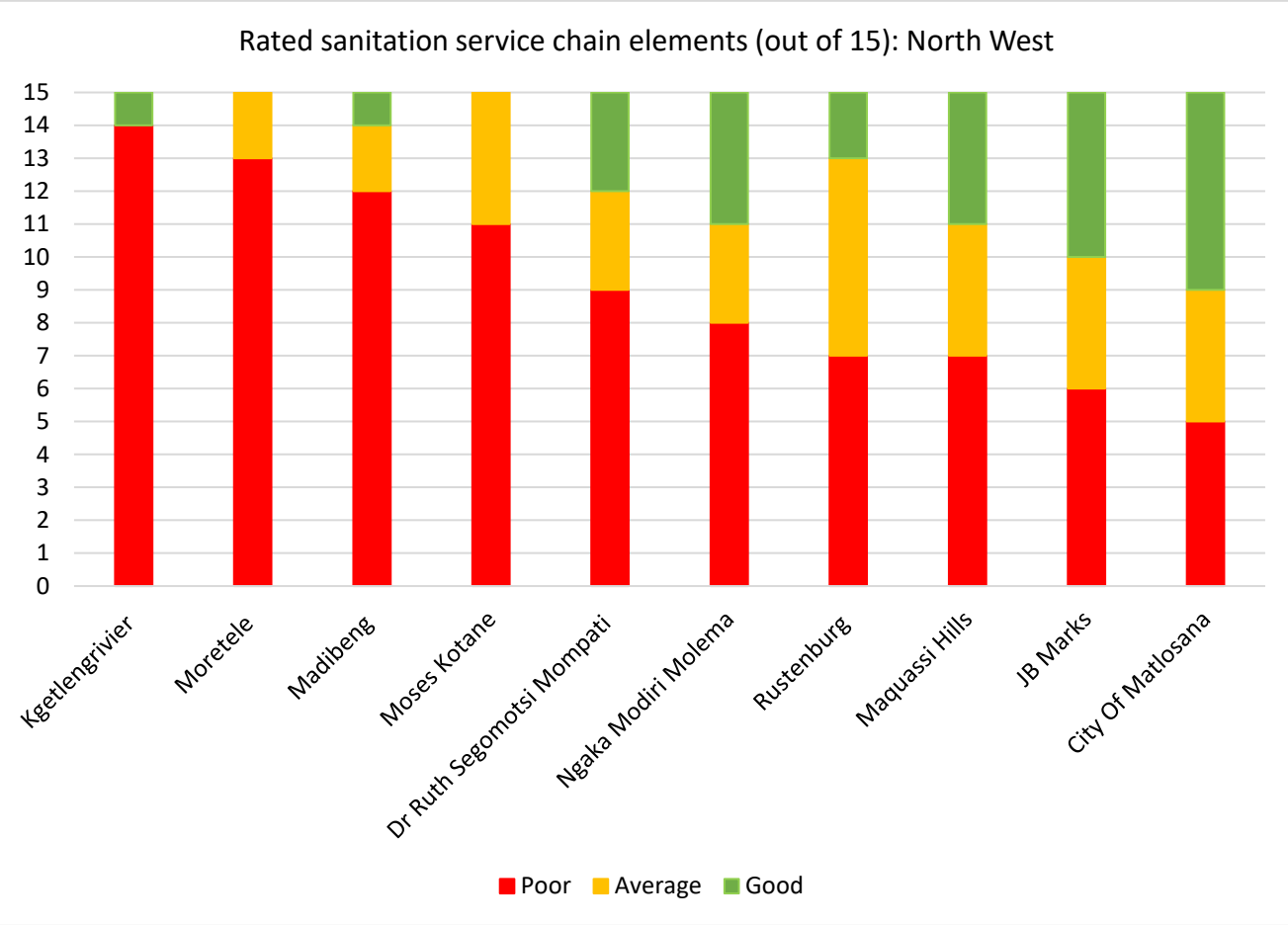


FIGURE 10-11: RATED WSAS IN NORTH WEST BASED ON THE PERFORMANCE OF THE 15 INDICATORS (LEFTMOST COLUMN = POOREST PERFORMER; RIGHTMOST COLUMN = BEST PERFORMER)

10.8 Key findings: North West

Is North West's sanitation in good health?

The analysis below provides a snapshot of North West's sanitation status as of 2022/23.

Overall

The sanitation status of the province can be categorised as 'poor'.

Access to sanitation/Containment

North West has a near-even rural–urban split, with 54% of households in rural areas and 46% in urban areas. Overall, 45% of households in the province are connected to the sewer system, while 51% rely on on-site sanitation. Additionally, 4% of the households have no access to sanitation. In urban areas, despite a higher reliance on sewered sanitation, a notable percentage of households (40%) use on-site sanitation, with 57% connected to the sewer network. In contrast, rural areas are more dependent on on-site sanitation, with 67% of rural households using on-site systems.

Bucket and chemical toilets

Although the use of bucket toilets has declined since 2011, over 5 000 households in the province continue to rely on bucket toilets, making North West the province with the lowest number of bucket toilets. In contrast, the number of households using chemical toilets has increased rapidly since 2018, with more than 101 000 households served by chemical toilets as of 2023 (DWS, 2023a). The continued use of bucket toilets and the increasing reliance on chemical toilets contribute to the ongoing 'inappropriate sanitation' backlog across WSAs in the province. These types of sanitation solutions, while providing a temporary alternative, do not meet the standards of more permanent and hygienic sanitation infrastructure.

Sanitation backlog

Overall, North West is not on track to meet sector targets by 2030 (e.g. SDG 6.2).

Three WSAs (JB Marks, Kgetlengrivier, Ngaka Modiri Molema) have a 'no service' backlog exceeding 5%, which is categorised as 'poor'. Six WSAs (Kgetlengrivier, Madibeng, Moretele, Moses Kotane, Ngaka Modiri Molema, Rustenburg) have an 'inappropriate sanitation' backlog exceeding 20%, also categorised as 'poor'. Two WSAs (City of Matlosana, Dr Ruth Segomotsi Mompati) have already eradicated their sanitation backlogs. Given the current rate of sanitation delivery (years to eradicate backlog), it is highly unlikely that five WSAs (JB Marks, Kgetlengrivier, Madibeng, Moses Kotane, Rustenburg) will eradicate their backlog by 2030.

Emptying and transport

Seven WSAs (Kgetlengrivier, Madibeng, Maquassi Hills, Moretele, Moses Kotane, Ngaka Modiri Molema, Rustenburg) indicated that they do not empty pits. This means that users need to empty their own pits, dig their own new pits, or resort to other means. WSAs need to ensure that users are aware of appropriate safety and hygiene measures to follow.

Eight WSAs (Dr Ruth Segomotsi Mompati, JB Marks, Kgetlengrivier, Madibeng, Maquassi Hills, Moretele, Moses Kotane, Rustenburg) indicated that they have a significant shortage of vacuum trucks and honeysuckers with their need exceeding 100% of their current fleet (i.e. they need to at least double their fleet). This result also seems to indicate that pit-emptying could currently be limited by the number of vacuum trucks and honeysuckers available. Furthermore, the condition of most of the existing vacuum trucks and honeysuckers is far from ideal, with six WSAs (JB Marks, Kgetlengrivier, Madibeng, Moretele, Moses Kotane, Rustenburg) indicating that they are in poor condition. This implies that breakdowns are inevitable and indicates a further vulnerability in emptying and transport.

Treatment

Only two WSAs (Maquassi Hills, Moretele) have WWTWs where the design capacity exceeds 90% utilisation. This implies that the capacity of the WWTWs at the remaining WSAs should be sufficient to treat incoming flows.

Despite the spare treatment capacity, the performance of many WWTWs is not ideal, with eight WSAs (City of Matlosana, Dr Ruth Segomotsi Mompati, Kgetlengrivier, Madibeng, Maquassi Hills, Moretele, Moses Kotane, Ngaka Modiri Molema) having a treated effluent quality with an overall compliance of less than 50%.

Most WSAs indicated a significant challenge with WWTW staffing, with seven WSAs (City of Matlosana, Dr Ruth Segomotsi Mompati, Kgetlengrivier, Maquassi Hills, Moretele, Moses Kotane, Ngaka Modiri Molema) indicating an overall WWTW staffing shortfall greater than 35%. This could contribute to the noted performance challenges.

Disposal and reuse

Five WSAs (Dr Ruth Segomotsi Mompati, Kgetlengrivier, Madibeng, Moretele, Moses Kotane) scored poorly for

wastewater sludge management as they do not analyse and classify their wastewater sludge and/or do not proactively manage their sludge end-use or disposal.

Similarly, four WSAs (Dr Ruth Segomotsi Mompati, Kgetlengrivier, Madibeng, Moretele) scored poorly for FSM as they do not analyse and classify their FS and/or do not proactively manage their FS end-use or disposal. Despite this, it is noted that six WSAs co-treat FS at their WWTWs. This could also be contributing to the poor performance noted.

Seven WSAs (City of Matlosana, Dr Ruth Segomotsi Mompati, JB Marks, Kgetlengrivier, Madibeng, Moretele, Moses Kotane) do not reuse treated wastewater effluent for any purpose. This lack of reuse could be because of the poor quality of treated effluent.

Institutional aspects

Eight WSAs (City of Matlosana, Dr Ruth Segomotsi Mompati, Kgetlengrivier, Madibeng, Maquassi Hills, Moretele, Moses Kotane, Ngaka Modiri Molema) have very poor Green Drop performance, scoring less than 50%.

Seven WSAs (City of Matlosana, Dr Ruth Segomotsi Mompati, Kgetlengrivier, Madibeng, Moretele, Ngaka Modiri Molema, Rustenburg) have significant sanitation staff challenges with sanitation staff vacancies of more than 35%.

Nine WSAs (Dr Ruth Segomotsi Mompati, JB Marks, Kgetlengrivier, Madibeng, Maquassi Hills, Moretele, Moses Kotane, Ngaka Modiri Molema, Rustenburg) indicated that the financial status of their sanitation business is far from ideal and is running at a deficit.

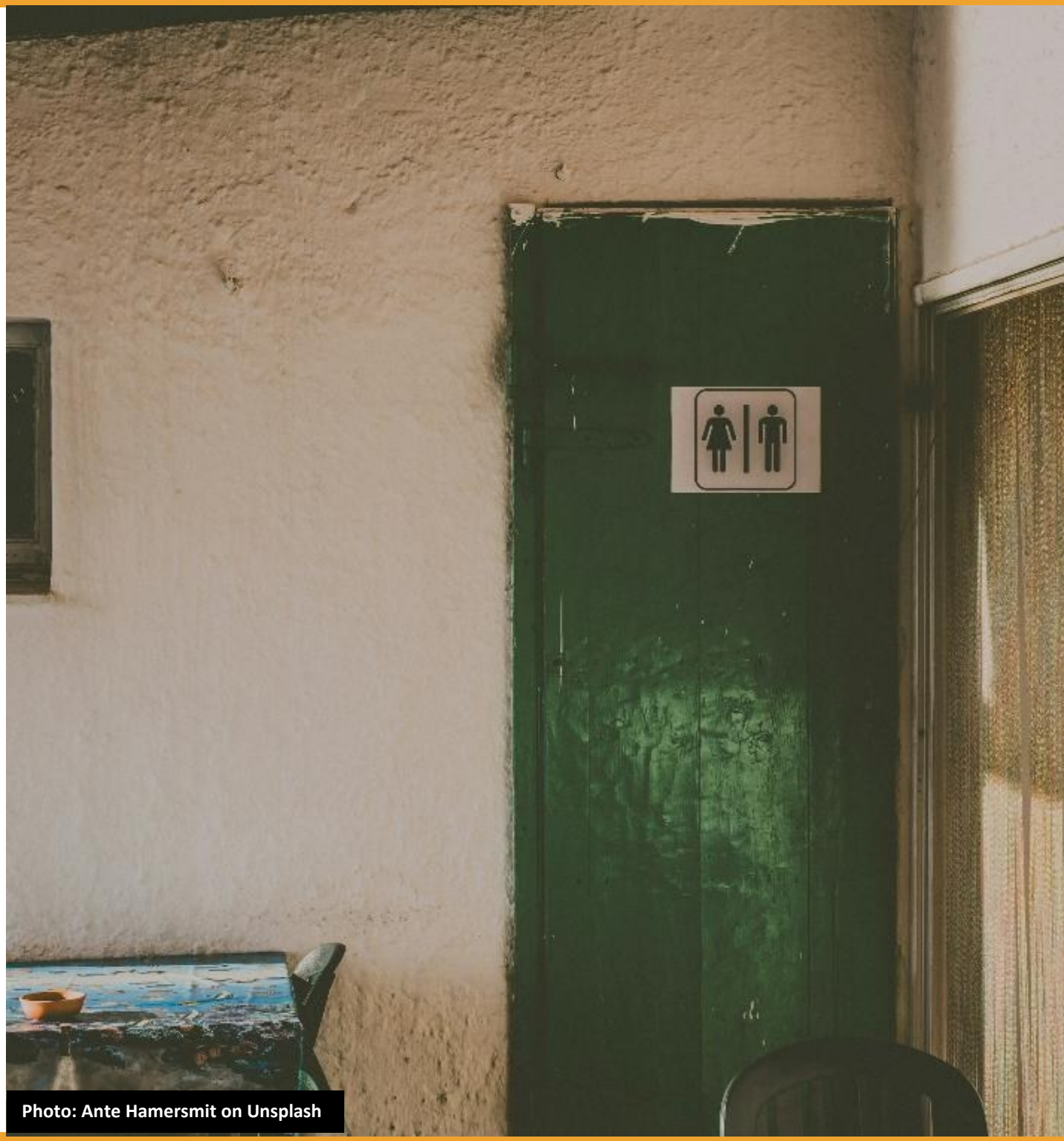


Photo: Ante Hamersmit on Unsplash

11 Situational analysis: Western Cape

Section 11 provides a summary of data and findings from the **Western Cape Situational Analysis** report.

For access to the full report, scan the QR code above.

What is the current reality in the province?

11.1 Western Cape overview

Water services authorities

WSAs are responsible for supplying both water and sanitation services to households in their area of jurisdiction. In the Western Cape, there are:

- 1 metropolitan municipality
- 5 district municipalities
- 24 local municipalities
- 25 WSAs

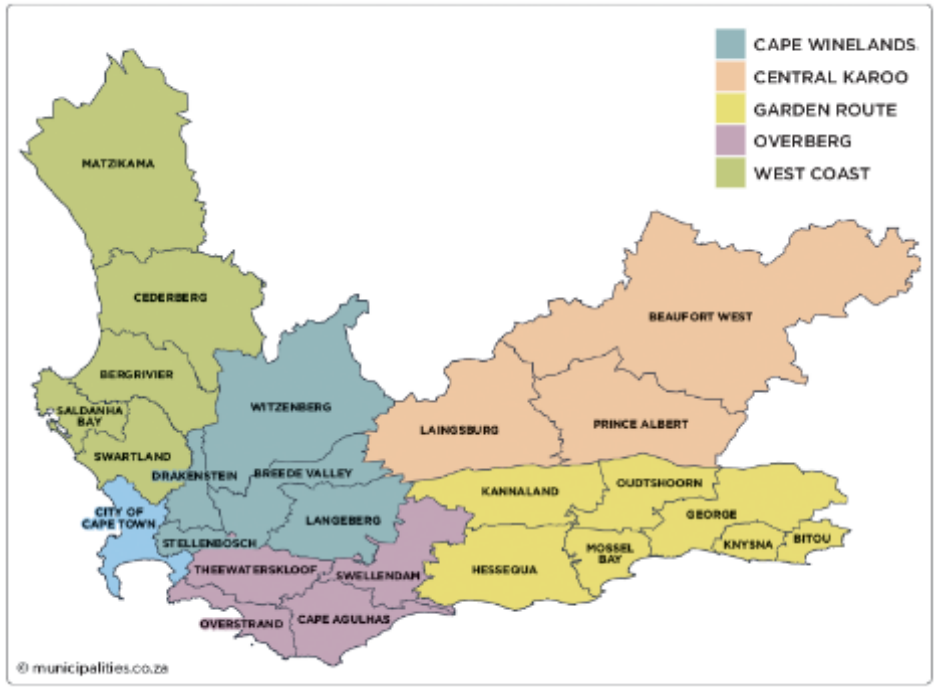


FIGURE 11-1: MUNICIPALITIES AND WSAS IN THE WESTERN CAPE

Metropolitan municipalities
City of Cape Town*

District municipalities
Cape Winelands
Central Karoo
Garden Route
Overberg
West Coast

Local municipalities		
Breede Valley*	Bitou*	Overstrand*
Drakenstein*	George*	Swellendam*
Langeberg*	Hessequa*	Theewaterskloof*
Stellenbosch*	Kannaland*	Bergrivier*
Witzenberg*	Knysna*	Cederberg*
Beaufort West*	Mossel Bay*	Matzikama*
Laingsburg*	Oudtshoorn*	Saldanha Bay*
Prince Albert*	Cape Agulhas*	Swartland*

11.2 Access to sanitation: Households

Sanitation service levels per household: A provincial view

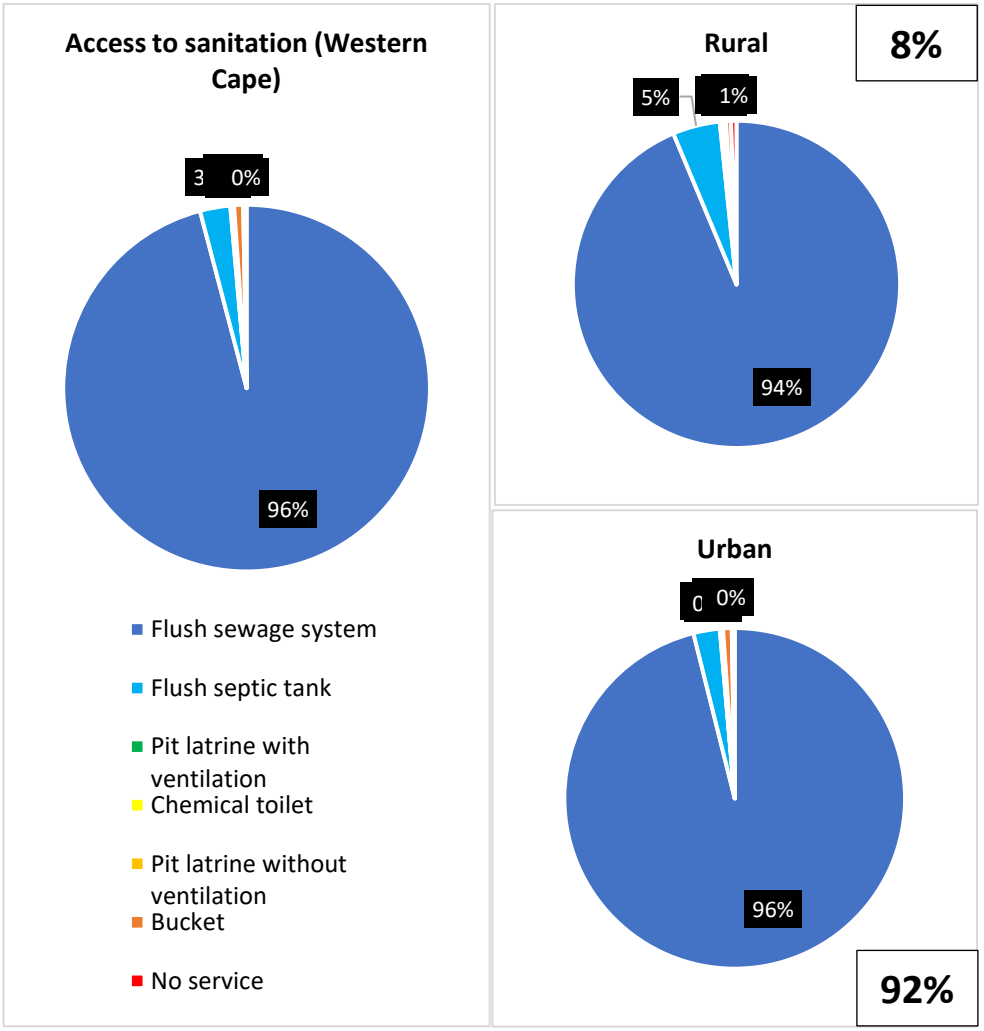


FIGURE 11-2: SANITATION SERVICE LEVELS PER HOUSEHOLD IN WESTERN CAPE

An analysis of sanitation provision by settlement type (see Figure 11-2 and Table 11-3) depicts a total number of 2 175 917 households in Western Cape, of which 176 025 (8%) are rural settlements and 1 999 892 (92%) urban settlements (DWS, 2022b).

The data shows that provincially:

- **96%** of households have access to a flush toilet connected to the sewage system.
- **0%** of households do not have access to sanitation (implying open defecation).
- The remaining **4%** of households utilise some form of on-site sanitation system, including septic tanks (3%), pit latrines with ventilation (i.e. VIPs) (0%), chemical toilets (0%), pit latrines without ventilation (0%) and bucket latrines (1%).

In rural settlements:

- **94%** of households have access to a flush toilet connected to the sewage system.
- **1%** of households do not have access to sanitation (implying open defecation).
- The remaining **5%** of households utilise some form of on-site sanitation system, including septic tanks (5%), pit latrines with ventilation (i.e. VIPs) (0%), chemical toilets (0%), pit latrines without ventilation (0%) and bucket latrines (1%).

In urban settlements:

- **96%** of households have access to a flush toilet connected to the sewage system.
- **0%** of households do not have access to sanitation (implying open defecation).
- The remaining **4%** of households utilise some form of on-site sanitation system, including septic tanks (2%), pit latrines with ventilation (i.e. VIPs) (0%), chemical toilets (0%), pit latrines without ventilation (0%) and bucket latrines (1%).

The analysis of sanitation provision by settlement type at the WSA level in the Western Cape is depicted in Figure 11-3 and detailed in Table 11-1, Table 11-2, and Table 11-3.

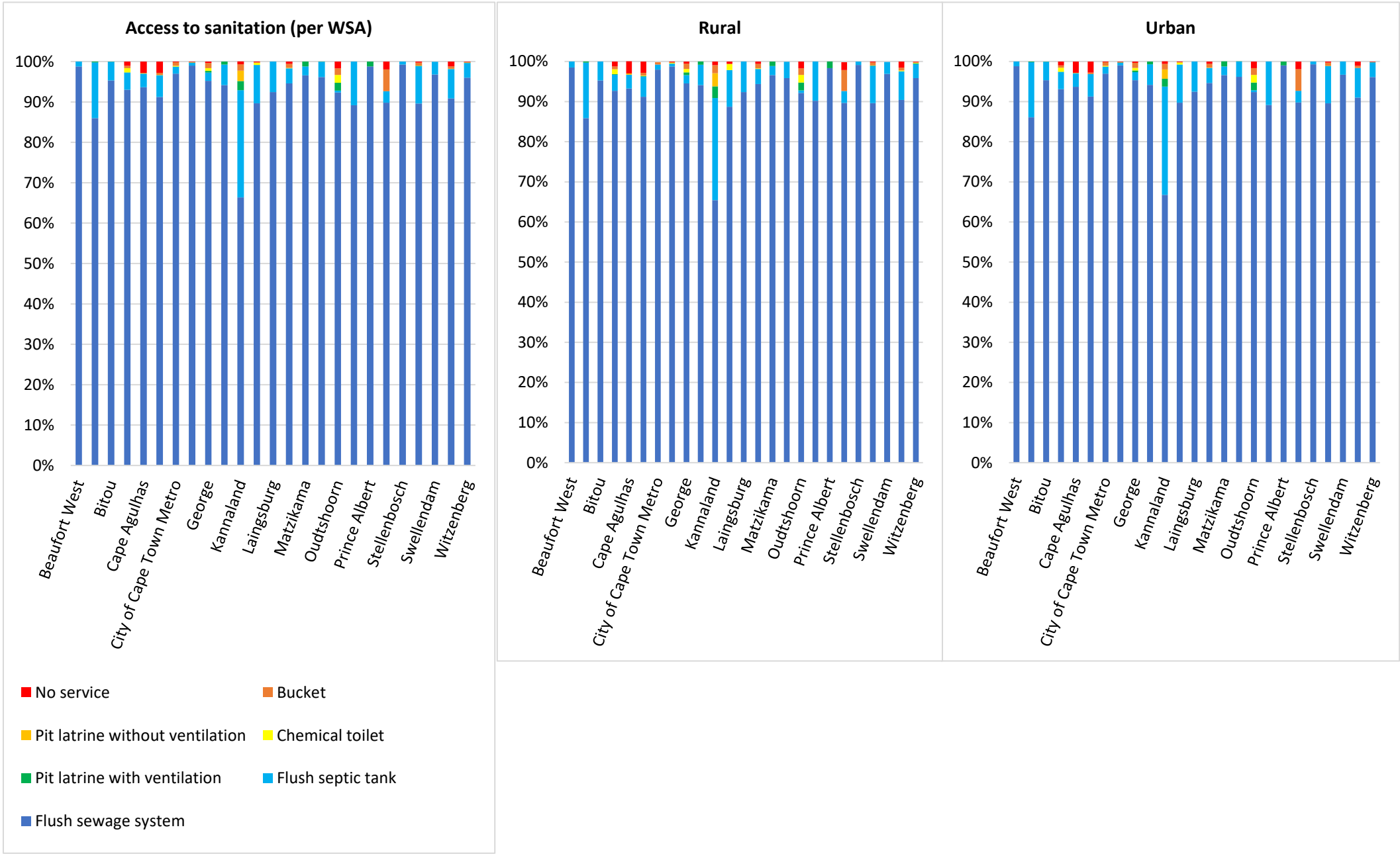


FIGURE 11-3: SANITATION SERVICE LEVELS PER HOUSEHOLD IN 25 WSAS IN THE WESTERN CAPE

TABLE 11-1: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN THE WESTERN CAPE (1)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Beaufort West	17 221		17 008	99	213	1	0	0	0	0	0	0	0	0	0	0
Rural	2 809	16	2 767	99	42	1	0	0	0	0	0	0	0	0	0	0
Urban	14 412	84	14 241	99	171	1	0	0	0	0	0	0	0	0	0	0
Bergrivier	22 149		19 046	86	3 055	14	48	0	0	0	0	0	0	0	0	0
Rural	10 836	49	9 306	86	1 502	14	28	0	0	0	0	0	0	0	0	0
Urban	11 313	51	9 740	86	1 553	14	20	0	0	0	0	0	0	0	0	0
Bitou	25 446		24 255	95	1 171	5	20	0	0	0	0	0	0	0	0	0
Rural	3 455	14	3 292	95	163	5	0	0	0	0	0	0	0	0	0	0
Urban	21 991	86	20 963	95	1 008	5	20	0	0	0	0	0	0	0	0	0
Breede Valley	54 319		50 520	93	2 307	4	26	0	576	1	0	0	328	1	555	1
Rural	12 682	23	11 755	93	511	4	19	0	153	1	0	0	91	1	148	1
Urban	41 637	77	38 765	93	1 796	4	7	0	423	1	0	0	237	1	407	1
Cape Agulhas	12 928		12 104	94	439	3	0	0	0	0	17	0	0	0	370	3
Rural	1 824	14	1 701	93	63	3	0	0	0	0	6	0	0	0	55	3
Urban	11 104	86	10 403	94	376	3	0	0	0	0	11	0	0	0	315	3
Cederberg	17 583		16 044	91	935	5	15	0	7	0	0	0	95	1	486	3
Rural	7 974	45	7 274	91	398	5	15	0	7	0	0	0	56	1	223	3
Urban	9 609	55	8 770	91	537	6	0	0	0	0	0	0	39	0	263	3
City of Cape Town Metro	1 413 442		1 370 920	97	24 324	2	27	0	3 378	0	0	0	12 230	1	2 556	0
Rural	3 586	0	3 514	98	45	1	0	0	0	0	0	0	20	1	0	0
Urban	1 409 856	100	1 367 406	97	24 279	2	27	0	3 378	0	0	0	12 210	1	2 556	0
Drakenstein	83 126		82 295	99	606	1	11	0	26	0	0	0	83	0	102	0
Rural	12 810	15	12 650	99	93	1	7	0	14	0	0	0	23	0	21	0
Urban	70 316	85	69 645	99	513	1	4	0	12	0	0	0	60	0	81	0
George	72 574		69 101	95	1 481	2	323	0	490	1	0	0	922	1	253	0
Rural	10 355	14	9 789	95	214	2	69	1	91	1	0	0	137	1	56	1
Urban	62 219	86	59 312	95	1 267	2	254	0	399	1	0	0	785	1	197	0

TABLE 11-2: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN THE WESTERN CAPE (2)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Hessequa	18 884		17 782	94	967	5	134	1	0	0	0	0	0	0	0	0
Rural	4 592	24	4 321	94	233	5	38	1	0	0	0	0	0	0	0	0
Urban	14 292	76	13 461	94	734	5	96	1	0	0	0	0	0	0	0	0
Kannaland	7 270		4 826	66	1 930	27	163	2	0	0	188	3	113	2	52	1
Rural	2 063	28	1 350	65	525	25	60	3	0	0	68	3	41	2	19	1
Urban	5 207	72	3 476	67	1 405	27	103	2	0	0	120	2	72	1	33	1
Knysna	28 898		25 913	90	2 737	9	0	0	176	1	0	0	12	0	54	0
Rural	2 090	7	1 855	89	190	9	0	0	33	2	0	0	0	0	12	1
Urban	26 808	93	24 058	90	2 547	10	0	0	143	1	0	0	12	0	42	0
Laingsburg	3 327		3 076	92	251	8	0	0	0	0	0	0	0	0	0	0
Rural	1 392	42	1 286	92	106	8	0	0	0	0	0	0	0	0	0	0
Urban	1 935	58	1 790	93	145	7	0	0	0	0	0	0	0	0	0	0
Langeberg	32 972		31 189	95	1 226	4	0	0	28	0	0	0	330	1	198	1
Rural	9 167	28	8 654	94	343	4	0	0	14	0	0	0	101	1	55	1
Urban	23 805	72	22 535	95	883	4	0	0	14	0	0	0	229	1	143	1
Matzikama	23 685		22 881	97	523	2	283	1	0	0	0	0	0	0	0	0
Rural	11 392	48	11 008	97	254	2	128	1	0	0	0	0	0	0	0	0
Urban	12 293	52	11 873	97	269	2	155	1	0	0	0	0	0	0	0	0
Mossel Bay	34 043		32 736	96	1 295	4	5	0	0	0	0	0	0	0	0	0
Rural	2 175	6	2 085	96	88	4	0	0	0	0	0	0	0	0	0	0
Urban	31 868	94	30 651	96	1 207	4	5	0	0	0	0	0	0	0	0	0
Oudtshoorn	27 120		25 037	92	139	1	519	2	523	2	0	0	447	2	452	2
Rural	4 711	17	4 341	92	32	1	90	2	91	2	0	0	77	2	79	2
Urban	22 409	83	20 696	92	107	0	429	2	432	2	0	0	370	2	373	2
Overstrand	38 507		34 349	89	4 158	11	0	0	0	0	0	0	0	0	0	0
Rural	2 121	6	1 913	90	208	10	0	0	0	0	0	0	0	0	0	0
Urban	36 386	94	32 436	89	3 950	11	0	0	0	0	0	0	0	0	0	0

TABLE 11-3: TOTAL HOUSEHOLDS BY SANITATION SERVICE LEVEL IN WATER SERVICES AUTHORITIES (WSAS) IN THE WESTERN CAPE (3)

(DWS WSKS) (April 2023)

Region	Total households (HH)		Flush sewage		Flush septic tank		Pit latrine with ventilation		Chemical toilet		Pit latrine without ventilation		Bucket		No service	
		%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
Prince Albert	4 849		4 791	99	0	0	58	1	0	0	0	0	0	0	0	0
Rural	1 493	31	1 468	98	0	0	25	2	0	0	0	0	0	0	0	0
Urban	3 356	69	3 323	99	0	0	33	1	0	0	0	0	0	0	0	0
Saldanha Bay	39 930		35 858	90	1 147	3	0	0	0	0	0	0	2 154	5	767	2
Rural	2 021	5	1 813	90	59	3	0	0	0	0	0	0	106	5	39	2
Urban	37 909	95	34 045	90	1 088	3	0	0	0	0	0	0	2 048	5	728	2
Stellenbosch	60 389		59 929	99	456	1	0	0	0	0	0	0	0	0	0	0
Rural	17 517	29	17 369	99	144	1	0	0	0	0	0	0	0	0	0	0
Urban	42 872	71	42 560	99	312	1	0	0	0	0	0	0	0	0	0	0
Swartland	43 934		39 370	90	4 061	9	36	0	21	0	0	0	332	1	113	0
Rural	16 407	37	14 708	90	1 511	9	18	0	13	0	0	0	121	1	36	0
Urban	27 527	63	24 662	90	2 550	9	18	0	8	0	0	0	211	1	77	0
Swellendam	13 553		13 116	97	432	3	0	0	0	0	0	0	0	0	0	0
Rural	4 508	33	4 369	97	134	3	0	0	0	0	0	0	0	0	0	0
Urban	9 045	67	8 747	97	298	3	0	0	0	0	0	0	0	0	0	0
Theewaterskloof	38 031		34 551	91	2 785	7	0	0	20	0	0	0	212	1	457	1
Rural	27 327	72	24 871	91	2 022	7	0	0	0	0	0	0	134	0	298	1
Urban	10 704	28	9 680	90	763	7	0	0	20	0	0	0	78	1	159	1
Witzenberg	41 737		40 079	96	1 493	4	49	0	14	0	0	0	53	0	44	0
Rural	17 341	42	16 626	96	604	3	35	0	14	0	0	0	37	0	26	0
Urban	24 396	58	23 453	96	889	4	14	0	0	0	0	0	16	0	18	0
Western Cape	**2 175 917**		**2 086 776**	**96**	**58 131**	**3**	**1 717**	**0**	**5 259**	**0**	**205**	**0**	**17 311**	**1**	**6 459**	**0**
Rural	**176 025**	**8**	**164 894**	**94**	**8 225**	**5**	**532**	**0**	**450**	**0**	**74**	**0**	**888**	**1**	**928**	**1**
Urban	**1 999 892**	**92**	**1 921 882**	**96**	**49 906**	**2**	**1 185**	**0**	**4 809**	**0**	**131**	**0**	**16 423**	**1**	**5 531**	**0**

11.3 Bucket and chemical toilets in the Western Cape

Are bucket toilets still in use?

Bucket toilets should have already been eradicated in South Africa. Yet, as of 2023, there are still more than 17 000 households in the Western Cape using bucket toilets (DWS, 2023b), as illustrated in Figure 11-4.

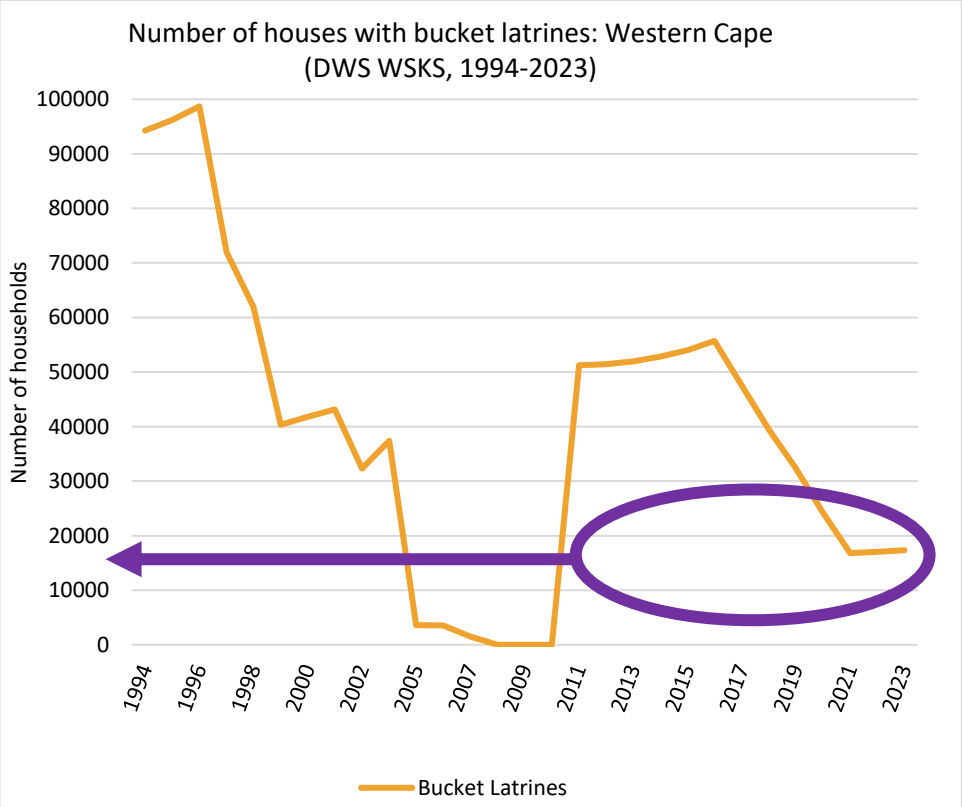


FIGURE 11-4: NUMBER OF HOUSEHOLDS WITH BUCKET LATRINES IN THE WESTERN CAPE FROM 1994 TO 2023

Are chemical toilets an issue?

Currently, more than 5 000 households in the Western Cape are served by chemical toilets (DWS, 2023b), as illustrated in Figure 11-5. Can the province afford this?

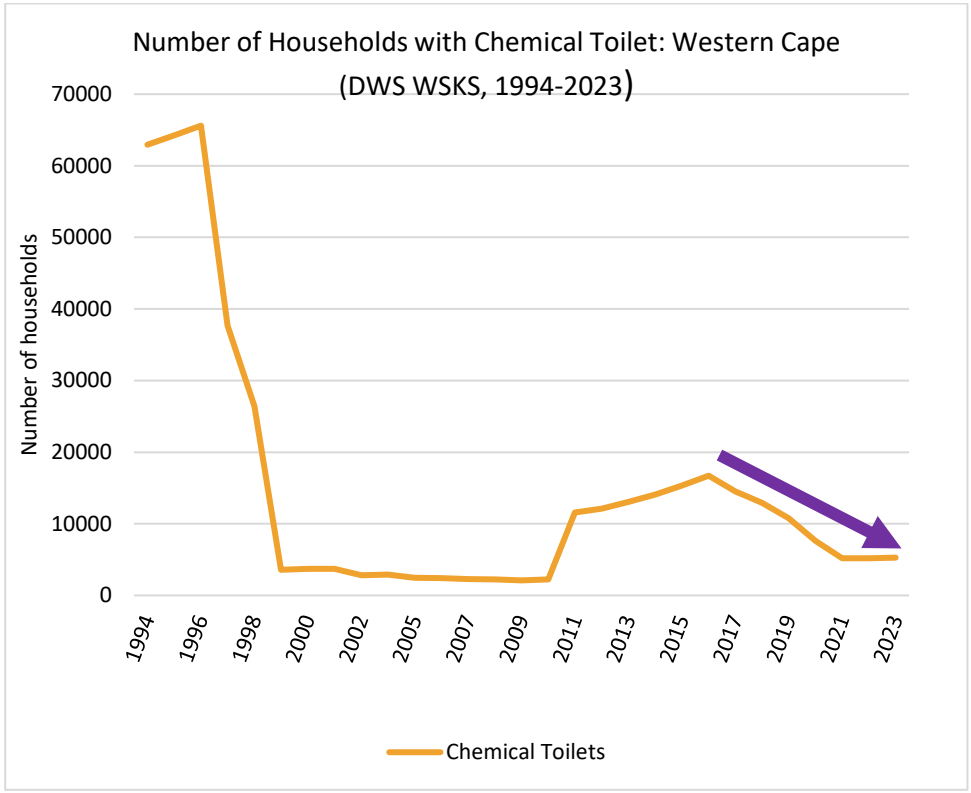


FIGURE 11-5: NUMBER OF HOUSEHOLDS WITH CHEMICAL TOILETS IN THE WESTERN CAPE FROM 1994 TO 2023

Assuming 2.5 households are served per chemical toilet (i.e. ~10 people per toilet, ~2 000 chemical toilets in operation), and chemical toilet rental costs of R750/month, this equates to a cost of **~R2 million/month** or **~R18 million/year**.

Could innovative sanitation alternatives meet the same needs (or perform even better) at a lower cost?

11.4 Progress on eradicating sanitation backlog

Is the Western Cape on target to eradicate sanitation backlogs?

The Western Cape is tracking well on overall backlogs. Beaufort West, Bergriver, Bitou, Hessequa, Laingsburg, Matzikama, Mosselbay, Overstrand, Prince Albert, Stellenbosch and Swellendam have eradicated their backlogs. Figure 11-6 shows the percentage of appropriate, inappropriate and unacceptable sanitation for each WSA in the Western Cape, as well as the overall statistics for the province.

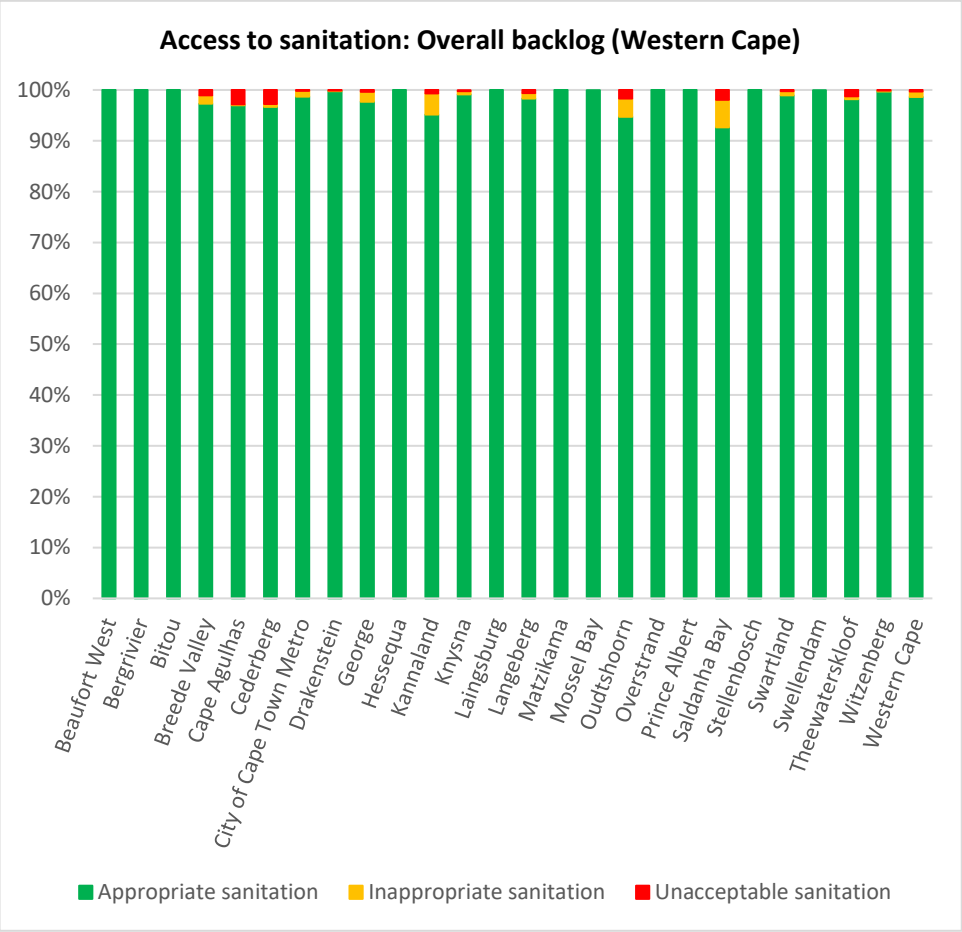


FIGURE 11-6: ACCESS TO SANITATION AND OVERALL BACKLOG IN THE WESTERN CAPE

TABLE 11-4: RATE OF SANITATION DELIVERY AND LIKELIHOOD OF WSAS IN THE WESTERN CAPE TO ACHIEVE BACKLOG ERADICATION

Rate of delivery (years to eradicate backlog) (as of 2021)	End date	Years to achieve	Rate of delivery (years to eradicate backlog)(as of 2021)	End date	Years to achieve
Beaufort West	2018	-3	Langeberg	2022	1
Bergrivier	2044	23	Matzikama	2022	1
Bitou	2038	17	Mossel Bay	2024	3
Breede Valley	2028	7	Oudtshoorn	2023	2
Cape Agulhas	2020	-1	Overstrand	2017	-4
Cederberg	2023	2	Prince Albert	2019	-2
City of Cape Town Metro	2028	7	Saldanha Bay	2033	12
Drakenstein	2023	2	Stellenbosch	2023	2
George	2022	1	Swartland	2025	4
Hessequa	2017	-4	Swellendam	2035	14
Kannaland	2021	0	Theewaterskloof	2019	-2
Knysna	2023	2	Witzenberg	2022	1
Laingsburg	2021	0			

NOTE: The figures above were calculated in 2021. Has there been progress since then? Has the rate of sanitation service delivery (i) increased, (ii) stayed the same, or (iii) decreased? Understanding (a) sanitation backlog and (b) the rate of sanitation service delivery will help to determine if WSAs are on track to meet sanitation access-related SDGs.

From Table 11-4 above:

- 8 WSAs have already eradicated their backlog (blue).
- 13 WSAs have a good chance of eradicating their backlog by 2030 (green).
- 4 WSAs are not addressing their backlogs quickly enough and are unlikely to achieve backlog eradication.

11.5 Municipal sanitation status: Western Cape

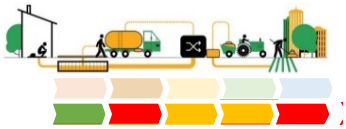
Where is the Western Cape doing well?

Access to sanitation has been improving since 1994 and the status of containment for the Western Cape province is categorised as 'good'. Despite this progress, emptying and transport have been categorised as 'poor' and treatment as 'average'. The status of disposal and reuse has been categorised as 'average' and institutional aspects is categorised as 'poor' for the Western Cape province. There appears to be limited innovation or value add related to the sanitation in some of the sanitation service chain components in the province. The province's biggest challenges are further compounded by growing informal settlements. Unfortunately, there is much work to do to improve sanitation in the province.

water & sanitation
Department: Water and Sanitation
REPUBLIC OF SOUTH AFRICA

National Sanitation Integrated Plan

Provincial Status Report
Western Cape



			Provincial Status	National Status
			Average	
				Total Provinces 9

			Data Set (*indicates number of WSAs with data submitted*)
Context			
Population (DWS WSKS) (April 2023)	7220526		25 / 25
Number of households (DWS WSKS) (April 2023)	2175917	HH	25 / 25
Number of wastewater treatment works	158		25 / 25
Number of sewer pump stations	945		25 / 25
Length of sewer pipelines	14522	km	17 / 25
Containment		**Good**	
1.1 No sanitation (backlog) (DWS WSKS) (April 2023)	0	% HH	Good 25 / 25
1.2 Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)	1	% HH	Good 25 / 25
1.3 Average rate of sanitation delivery (years to eradicate backlog)	4	years	Good 25 / 25
Emptying and Transport		**Poor**	
2.1 Sewer network condition	NI		0 / 25
2.2 Pit toilet emptying	44	% of WSAs	Poor 24 / 25
2.3 Vacuum truck / honeysucker needs	62	trucks	Poor 25 / 25
2.4 Vacuum truck / honeysucker condition	44	% in fair condition	Poor 25 / 25
Treatment		**Average**	
3.1 % of wastewater treatment works design capacity utilised	66	%	Good 24 / 25
3.1.1 Design capacity	1107.3	Ml/d	25 / 25
3.1.2 Available capacity	1095.0	Ml/d	25 / 25
3.1.3 Operational capacity	733.6	Ml/d	23 / 25
3.2 Wastewater treatment works effluent quality	65	% compliance	Average 25 / 25
3.2.1 Microbiological compliance	64	%	25 / 25
3.2.2 Chemical compliance	62	%	25 / 25
3.2.3 Physical compliance	71	%	25 / 25
3.3 Wastewater treatment works staffing shortfall	28	%	Poor 25 / 25
3.3.1 Number of supervisor(s): Compliant	61		25 / 25
3.3.2 Number of supervisor(s): Shortfall	19		25 / 25
3.3.3 Number of PC(s): Compliant	267		25 / 25
3.3.4 Number of PC(s): Shortfall	106		25 / 25
Disposal and Reuse		**Average**	
4.1 Analysis and classification of wastewater sludge	76	% of WSAs	Average 23 / 25
4.2 Wastewater sludge management	28	% acceptable practices	25 / 25
4.3 Analysis and classification of faecal sludge	36	% of WSAs	Poor 23 / 25
4.4 Faecal sludge management	72	% acceptable practices	25 / 25
4.5 Treated wastewater effluent reuse	60	% of WSAs	Average 25 / 25
Institutional Aspects		**Poor**	
5.1 Green Drop performance (2021)	84	%	Average 25 / 25
5.2 Sanitation staff vacancies	27	%	Poor 22 / 25
5.3 Sanitation business financial status	32	% of WSAs operate a surplus	Poor 19 / 25
5.4 Growing informal settlements	36	% of WSAs	21 / 25
5.5 Shit-flow diagrams developed for sanitation systems	12	% of WSAs	24 / 25
5.6 Alternative/innovative sanitation processes or technologies implemented	40	% of WSAs have implement multiple	25 / 25
5.6.1 Toilets	*40*	% of WSAs	23 / 25
5.6.2 Emptying	*20*	% of WSAs	24 / 25
5.6.3 Transport	*20*	% of WSAs	24 / 25
5.6.4 Treatment	*52*	% of WSAs	25 / 25
5.6.5 Disposal benefication	*0*	% of WSAs	24 / 25
5.6.6 New business models	*32*	% of WSAs	24 / 25



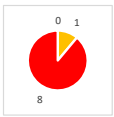




FIGURE 11-7: SANITATION STATUS IN THE WESTERN CAPE

11.6 1st order excreta flow diagram (SFD): Western Cape

What are some of the contributors to poor sanitation performance?

The 1st order SFD for Western Cape (Figure 11-8) highlights significant gaps in the sanitation service chain. These deficiencies all potentially have a negative impact on communities (e.g. water supply) and the environment (e.g. water sources).

Containment:

- Appropriately constructed off-site sanitation systems, and 54% of on-site sanitation systems not emptied

Emptying and transport:

- Inadequate maintenance and servicing of basic sanitation systems (e.g. not emptied) (8%)
- Lost sewage due to old and leaking pipes

Treatment:

- 11% of the WWTW are at critical state

End-use or disposal:

- Inadequate sludge analysis and classification, and resultant 32% inappropriate sludge disposal and/or non-beneficial use

Institutional:

- Inadequate sanitation systems or programme funding

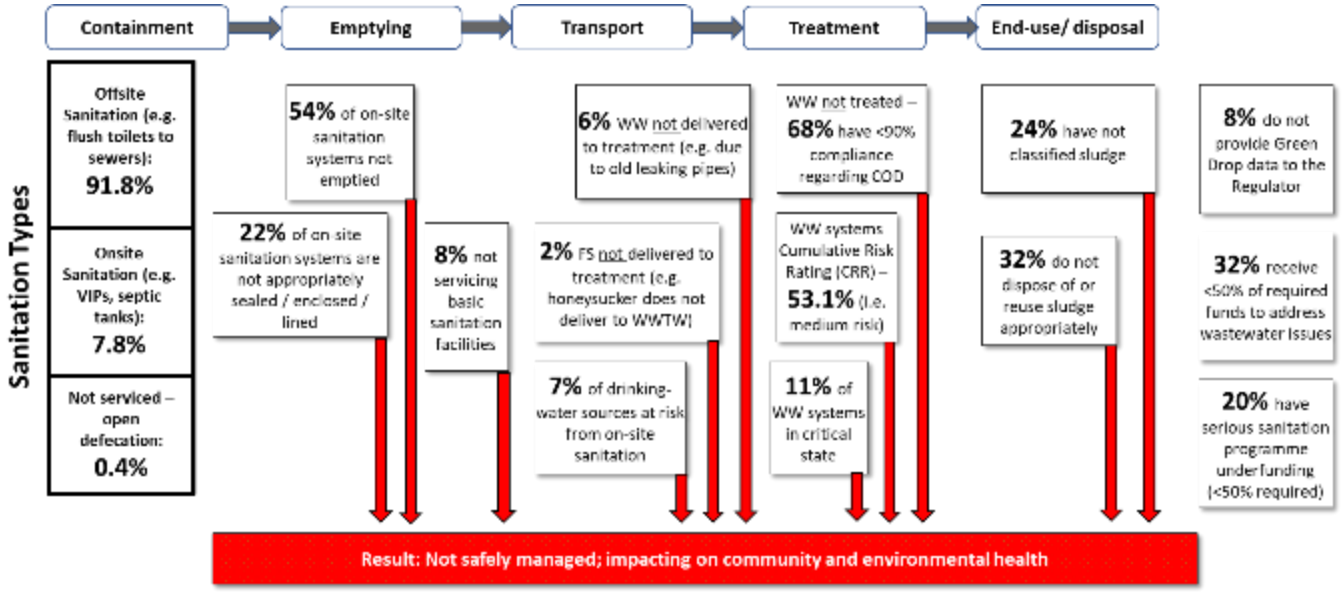


FIGURE 11-8: 1ST ORDER SFD: WESTERN CAPE

11.7 Sanitation service chain status

An analysis of the sanitation service chain shows there is much work to do

A total of 15 indicators were selected and analysed to assess the status of the sanitation service chain, focusing on the quality of available data. This includes three indicators for each of the four service chain components, plus three additional indicators addressing institutional aspects. The analysis results for the Western Cape, obtained from the situational analysis tool developed as part of the NSIP Project, are presented visually in Figure 11-9 to Figure 11-11. The colour coding used in the analysis indicates effectiveness levels based on predefined scoring criteria. Green signifies that systems are functioning well and meeting expectations, while amber indicates average performance with identified areas for improvement. In contrast, red highlights poor performance or significant issues that require immediate attention (refer to Appendix B of the Monitoring Framework and Guide for detailed scoring rules). The visual representation in Figure 11-9 provides a comprehensive overview of the sanitation status along the service chain for all provinces in the country, allowing for quick and easy assessment at a glance.

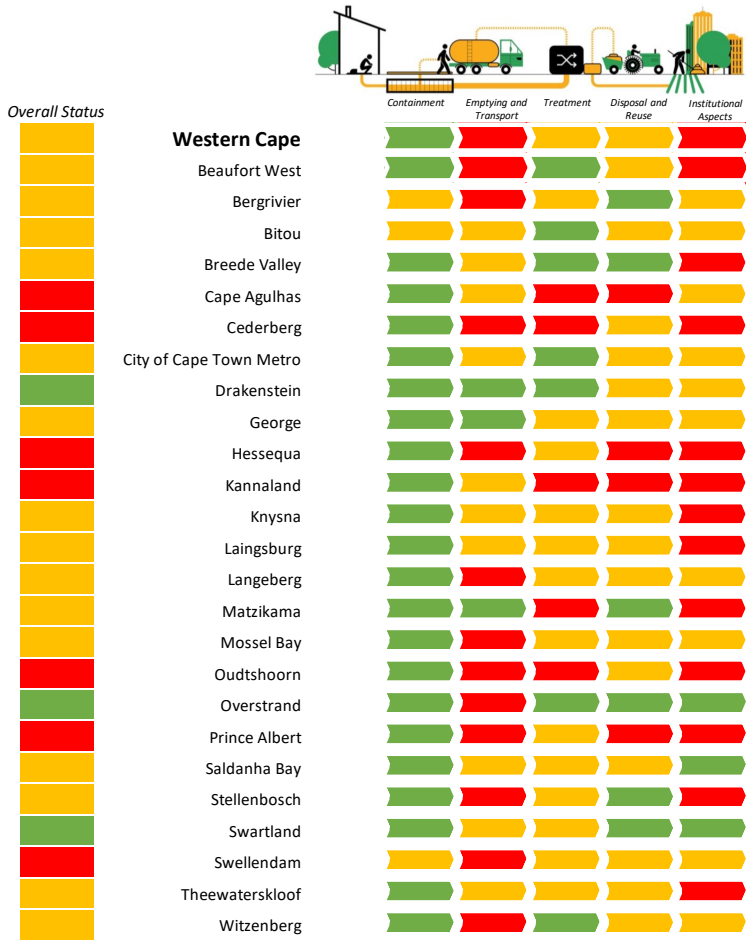


FIGURE 11-9: OVERVIEW OF SANITATION STATUS ALONG THE SERVICE CHAIN FOR WSAS IN THE WESTERN CAPE

Overall score	
>75%	Good
50%-75%	Average
<50%	Poor

- The overall performance of the Western Cape is categorised as 'average'. One WSA (Drakenstein) stands out, performing well overall. The majority of WSAs are categorised as 'average' while three are categorised as 'poor'.
- Containment appears to be under control for the majority of WSAs, with no WSAs performing poorly in this regard.
- Some pockets of good performance are noted for emptying and transport, treatment, and disposal and reuse.
- Nevertheless, there is still room for improvement in sanitation practices in the Western Cape.
- The health of the sanitation service chain is not ideal, with institutional aspects predominantly categorised as 'poor' across most WSAs, and six WSAs holding an 'average' status in this regard.

11.7.1 Heat map: Western Cape

The heat map further highlights key deficiencies in the sanitation service chain

The results of the analysis of the 15 indicators are represented for all the WSAs in the Western Cape in the heat map in Figure 11-10. Green signifies that systems are functioning well and meeting the expectations defined by the scoring criteria. Amber indicates average performance, suggesting areas that require improvement, while red highlights poor performance or significant issues that require immediate attention. Although there are pockets of good performance, overall, there is still areas that require improvement.

Indicator #	Western Cape	Beaufort West	Bergrivier	Bitou	Breede Valley	Cape Agulhas	Cederberg	City of Cape Town Metro	Drakenstein	George	Hessequa	Kannaland	Knysna	Laingsburg	Langeberg	Matzikama	Mossel Bay	Oudtshoorn	Overstrand	Prince Albert	Saldanha Bay	Stellenbosch	Swartland	Swellendam	Theewaterskloof	Witzenberg
	Overall sanitation status																									
	Containment																									
1	No sanitation (backlog) (DWS WSKS) (April 2023)																									
2	Inappropriate sanitation (backlog) (DWS WSKS) (April 2023)																									
3	Rate of sanitation delivery (backlog eradication)																									
	Emptying and Transport																									
4	Pit toilet emptying																									
5	Vacuum truck / honeysucker needs																									
6	Vacuum truck / honeysucker condition																									
	Treatment																									
7	WWTW design capacity utilised																									
8	WWTW effluent quality																									
9	WWTW staffing shortfall																									
	Disposal and Reuse																									
10	Analysis and classification of wastewater sludge Wastewater sludge management																									
11	Analysis and classification of faecal sludge Faecal sludge management																									
12	Treated wastewater effluent reuse																									
	Institutional Aspects																									
13	Green Drop performance																									
14	Sanitation staff vacancies																									
15	Sanitation business financial status																									

Green – Good | Amber – Average | Red – Poor

FIGURE 11-10: HEAT MAP SHOWING THE STATUS OF THE 15 INDICATORS FOR WSAS IN THE WESTERN CAPE

11.7.2 Rating WSAs in the Western Cape: Sanitation service chain elements

The performance of each of the 15 indicators of the sanitation service chain highlights key deficiencies at WSAs

Using the heat map and total scores of the 15 indicators, each WSA in the Western Cape is ranked from poorest-performing on the left to best-performing on the right, as shown in Figure 11-11. WSAs facing significant challenges across the sanitation service chain, including related institutional factors, are marked mostly in red, starting on the far left, while those that are performing well are indicated mostly in green, moving towards the far right.

The 15 sanitation service chain elements that are rated are indicated below:

	Containment
1.	No sanitation (backlog)
2.	Inappropriate sanitation (backlog)
3.	Rate of sanitation delivery (years to eradicate backlog)
	Emptying and transport
4.	Pit toilet emptying
5.	Vacuum truck/honeysucker needs
6.	Vacuum truck/honeysucker condition
	Treatment
7.	WWTW design capacity utilised
8.	WWTW effluent quality
9.	WWTW staffing shortfall
	Disposal and reuse
10.	Analysis and classification of wastewater sludge
	Wastewater sludge management
11.	Analysis and classification of FS
	FSM
12.	Treated wastewater effluent reuse
	Institutional aspects
13.	Green Drop performance (2021)
14.	Sanitation staff vacancies
15.	Sanitation business financial status

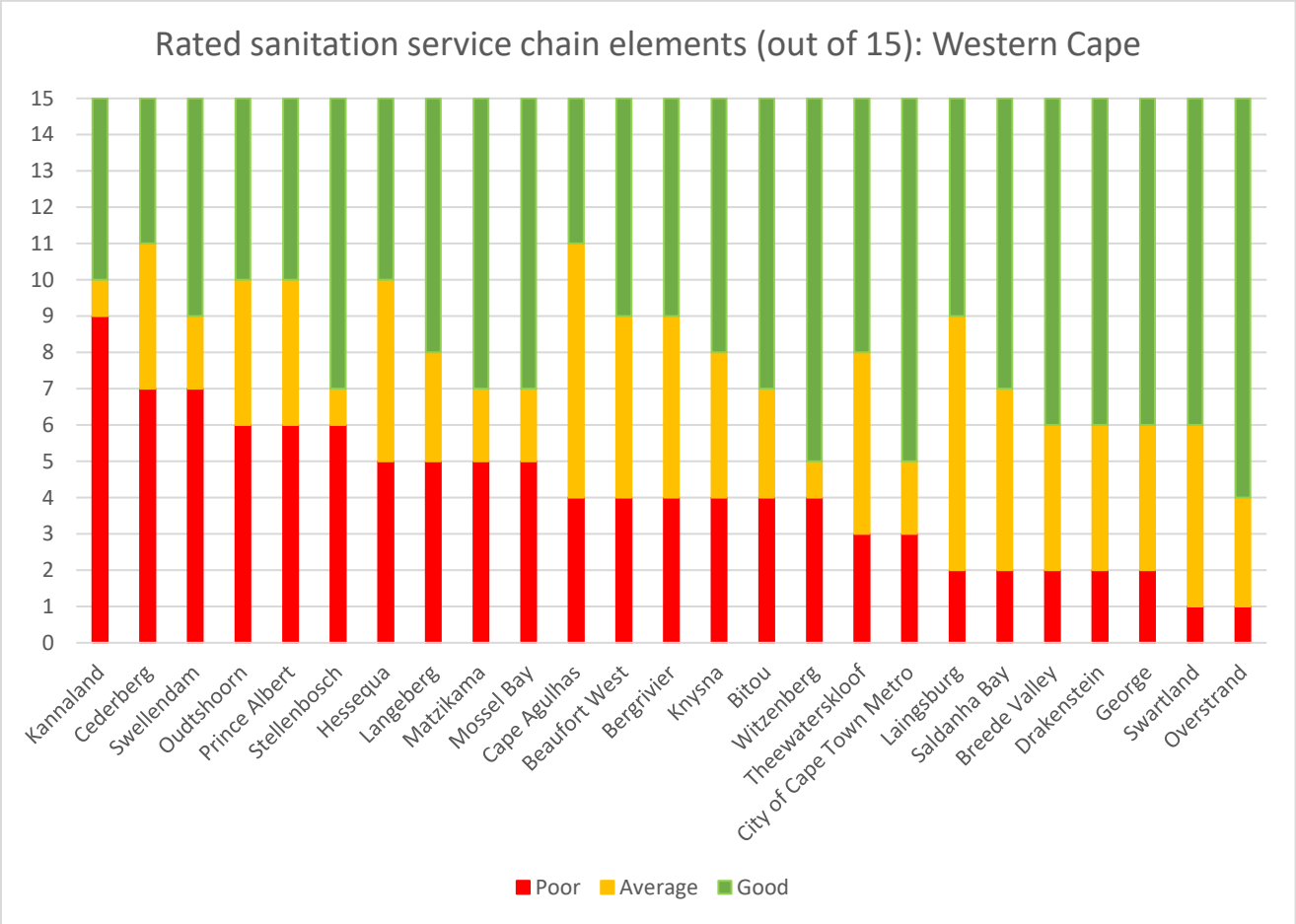


FIGURE 11-11: RATED WSAS IN THE WESTERN CAPE BASED ON THE PERFORMANCE OF THE 15 INDICATORS (LEFTMOST COLUMN = POOREST PERFORMER; RIGHTMOST COLUMN = BEST PERFORMER)

11.8 Key findings: Western Cape

Is the Western Cape's sanitation in good health?

The analysis below provides a snapshot of the Western Cape's sanitation status as of 2022/23.

Overall

The sanitation status of the Western Cape province can be categorised as 'average'.

Access to sanitation/Containment

The Western Cape has a very high proportion of urban settlements, with 92% of households in urban areas and 8% in rural areas. Overall, a large percentage (96%) of households in the province are connected to the sewer system, while 4% rely on on-site sanitation. In the Western Cape, both urban and rural areas have high proportions of households with access to sewered systems. In urban areas, 96% of households are connected to the sewer network, while 4% of households use on-site sanitation solutions. Similarly, in rural areas, 94% of households have sewer connections, while 5% rely on on-site sanitation solutions. This indicates good access to sewer systems in the province's rural areas compared to other provinces.

Bucket and chemical toilets

Although the use of bucket toilets declined significantly between 2017 and 2021, the numbers have remained relatively stable since then. As of 2023, over 17 000 households in the province continue to rely on bucket toilets. In contrast to the overall trend of increasing use of chemical toilets in other provinces, the Western Cape has experienced a slight decline in the number of households using chemical toilets since 2017, with numbers remaining relatively constant from 2021 onward. Despite having the lowest number of chemical toilets in the country, more than 5 000 households in the province are served by chemical toilets as of 2023 (DWS, 2023b). The continued use of bucket toilets and the increasing reliance on chemical toilets contribute to the ongoing 'inappropriate sanitation' backlog across WSAs in the province. These types of sanitation solutions, while providing a temporary alternative, do not meet the standards of more permanent and hygienic sanitation infrastructure.

Sanitation backlog

Overall, the Western Cape is on track to meet sector targets by 2030 (e.g. SDG 6.2). Two WSAs (Cape Agulhas and Cederberg) have a 'no service' backlog exceeding 2%, which is categorised as 'average'. The remaining WSAs have a 'no sanitation' backlog of less than 2%, which is categorised as 'good'. All WSAs have met their 'inappropriate sanitation' backlog of less than 10%, which is categorised as 'good'. Given the current rate of sanitation delivery (years to eradicate backlog), four WSAs (Bergrivier, Bitou, Saldanha Bay and Swellendam) will not meet sanitation backlog by 2030. Twenty-one WSAs (Beaufort West, Breede Valley, Cape Agulhas, Cederberg, City of Cape Town Metro, Drakenstein, George, Hessequa, Kannaland, Knysna, Laingsburg, Langeberg, Matzikama, Mossel Bay, Oudtshoorn, Overstrand, Prince Albert, Stellenbosch, Swartland, Theewaterskloof and Witzenberg) will likely eradicate sanitation backlog by 2030.

Emptying and transport

Fourteen WSAs (Beaufort West, Bergrivier, Bitou, Cederberg, Hessequa, Langeberg, Oudtshoorn, Overstrand, Prince Albert, Saldanha Bay, Stellenbosch, Swellendam, Swartland and Witzenberg) indicated that they do not empty pits. This means that users need to empty their own pits, dig their own new pits, or resort to other means. WSAs need to ensure that users are aware of appropriate safety and hygiene measures to follow. Five WSAs (City of Cape Town Metro, Langeberg, Mossel Bay, Stellenbosch and Swellendam) indicated that they have a significant shortage of vacuum trucks and honeysuckers with their need exceeding 100% of their current fleet (i.e. they need to at least double their fleet). This result also seems to indicate that pit-emptying could currently be limited by the number of vacuum trucks and honeysuckers available. Furthermore, the condition of most of the existing vacuum trucks and honeysuckers is far from ideal, with nine WSAs (Beaufort West, Cederberg, Kannaland, Laingsburg, Mossel Bay, Oudtshoorn, Stellenbosch, Swellendam and Witzenberg) indicating that they are in poor condition. This implies that breakdowns are inevitable and indicates a further vulnerability in emptying and transport.

Treatment

Most WSAs appear to utilise the WWTW within their design capacity. However, one WSA (Cape Agulhas) has WWTWs where the design capacity exceeds 90% utilisation. Despite the spare treatment capacity, the performance of many WWTWs is not ideal, with five WSAs (Cederberg, Kannaland, Matzikama, Oudtshoorn and Prince Albert) having a treated effluent quality with an overall compliance of less than 50%. Most WSAs indicated a significant challenge with WWTW staffing, with 12 WSAs (Bergrivier, Cape Agulhas, Cederberg, George, Kannaland, Knysna, Langeberg, Matzikama, Mossel Bay, Oudtshoorn, Stellenbosch and Swellendam) indicating an overall WWTW staffing shortfall greater

than 35%. This could contribute to the noted performance challenges.

Disposal and reuse

Five WSAs (Cape Agulhas, Cederberg, City of Cape Town Metro, Kannaland and Oudtshoorn) scored poorly for wastewater sludge management as they do not analyse and classify their wastewater sludge and/or do not proactively manage their sludge end-use or disposal. Six WSAs (Bitou, Hessequa, Kannaland, Knysna, Saldanha Bay and Witzenberg) scored poorly for FSM as they do not analyse and classify their FS and/or do not proactively manage their sludge end-use or disposal. Despite this, it is noted that 16 WSAs co-treat FS at their WWTWs. This could also be contributing to the poor performance noted. Ten WSAs (Cape Agulhas, Drakenstein, George, Hessequa, Kannaland, Langeberg, Mossel Bay, Prince Albert, Stellenbosch and Theewaterskloof) do not reuse treated wastewater effluent for any purpose. This lack of reuse could be because of the poor quality of treated effluent.

Institutional aspects

Seven WSAs (Hessequa, Kannaland, Langeberg, Matzikama, Oudtshoorn, Prince Albert and Swellendam) have very poor Green Drop performance, scoring less than 50%. Thirteen WSAs (Beaufort West, Bergrivier, Breede Valley, Cederberg, Drakenstein, Kannaland, Knysna, Laingsburg, Matzikama, Prince Albert, Stellenbosch, Theewaterskloof and Witzenberg) have significant sanitation staff challenges with sanitation staff vacancies of more than 35%. Thirteen WSAs (Beaufort West, Bitou, Breede Valley, Cederberg, City of Cape Town Metro, Hessequa, Knysna, Kannaland, Matzikama, Mossel Bay, Prince Albert, Stellenbosch and Theewaterskloof) indicated that the financial status of their sanitation business is far from ideal and is running at a deficit.

12 Progress and achievements

What has been accomplished?

12.1 Research, development and innovation

What is being done to provide alternative sanitation solutions?

The WRC has been at the global forefront of sanitation research and development. These advances have led to several exciting initiatives and programmes to improve sanitation in South Africa.

The Department of Science and Innovation (DSI), in collaboration with the WRC, has established the Water Technologies Demonstration Programme (WADER) to pull together the applied research and development (R&D) and pre-commercialisation stages of the water innovation continuum and to create an enabling environment for fast-tracking technologies to the market.

https://wader.org.za/

The South African Sanitation Technology Enterprise Programme (SASTEP) organises various components, systems, role players and resources required to foster a new and emerging sanitation industry in South Africa. Through strategic partnerships with relevant stakeholders and policy makers, SASTEP seeks to enhance existing policy and regulatory frameworks that will promote, support, and attempt to remove impediments to a new sanitation paradigm. By providing guidance and support, the programme champions the harmonisation of product and performance standardisation to enable the development of suitable sanitation technologies, provide end users with confidence and assurance, reduce cost, minimise waste, and increase productivity at different levels of the sanitation service chain.

https://sastep.org.za/

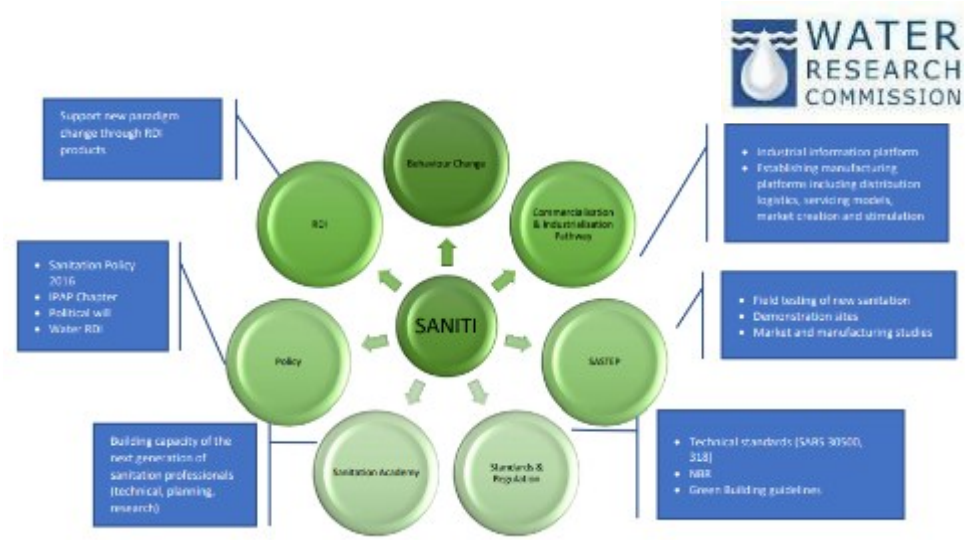


FIGURE 12-1: ELEMENTS INTEGRATED INTO THE SANITI STRATEGY (PILLAY AND BHAGWAN, 2021)

12.2 Advancing innovation in sanitation technologies

Taking important steps towards a better future for sanitation

In pursuit of sustainable and resource-efficient sanitation solutions, notable developments have taken place to promote appropriate technology adoption and accreditation.

In collaboration with the WRC and DSI, DWS has taken key steps to drive advancements in sanitation infrastructure and incentivise innovation.

1. **Sanitation Technology Technical Coordination Committee (STTCC)**: To foster informed decision-making, DWS has set up a dedicated committee responsible for advising on appropriate and acceptable sanitation technologies using appropriate technology criteria.
2. **Sanitation technologies evaluation criteria:** Recognising the importance of well-defined evaluation standards, DWS has developed robust criteria for assessing sanitation technologies.
3. **Formal process for technology certification and accreditation:** Streamlining the adoption process, DWS has instituted a formal accreditation protocol. Innovators now have a fair and transparent opportunity to present their technologies for consideration and registration on the DWS database, the Technology Knowledge Centre (TKC). This approach ensures that promising innovations receive due recognition and are readily accessible to stakeholders.
4. **Funding models to encourage resource-efficient infrastructure**: Acknowledging the financial challenges in implementing sanitation solutions, innovative funding models have been devised. These models offer incentives and support to encourage the adoption of resource-efficient sanitation infrastructure. By providing financial backing and recognition, DWS aims to accelerate the uptake of sustainable sanitation technologies.

Together, these initiatives represent a significant stride towards cultivating sustainable sanitation in South Africa. By empowering innovators, setting clear evaluation standards, and offering incentives, the groundwork is laid for a future where efficient sanitation solutions become accessible to all.

New models for the sustainable operation and maintenance of school sanitation facilities

A WRC study by Cottingham and Neethling (2022) found that there was a good case for raising external revenue from non-DBE sources to fund operation and maintenance (O&M) activities at schools.

Five different models for raising external revenue for sanitation O&M were developed under this study, with the most promising model based on a school hosting a free public Wi-Fi hotspot, with Wi-Fi access exposing the user to advertising and/or requiring them to complete a market research survey. A company would own the hotspot and pay for a capped free monthly data package. Companies benefit from advertising with guaranteed views and from collecting consumer data from hard-to-reach markets. Schools benefit from a free Wi-Fi allowance for their own use and from increased funding for O&M.

Other models were based on other forms of advertising on school property, increasing product sales, and supporting firms with B-BBEE compliance and novel corporate social investment opportunities.

There is an urgent need for sanitation solutions that are safe, sustainable, and practical to implement at scale.

12.2.1 Emerging and available alternative sanitation technologies

What alternative sanitation solutions are available for consideration?

Many alternative sanitation solutions have been developed in recent years. Have these been explored to determine if they could solve local sanitation challenges?

The water and sanitation sector needs to be better informed of the variety of sanitation options that are currently available.

What components of the sanitation service chain does the technology address?

Some solutions cover the entire sanitation service chain (i.e. rendering benefits across each stage of the service chain). An example of such a comprehensive technology is a waterless composting toilet, which encompasses containment, treatment, and beneficial re-use.

Conversely, technologies like portable honeysuckers may offer advantages limited to specific components of the sanitation service chain (e.g. emptying and transport).

It is crucial for the sector to explore and consider these innovations to enable a more sustainable and efficient approach to sanitation.

Is the technology ready to use?

The technology readiness level (TRL) is a scale that is used to assess the maturity and readiness of a particular technology or innovation for practical application or implementation.

It's important to note that emerging and alternative sanitation technologies' levels of suitability, effectiveness and readiness vary; some technologies are not commercially available yet (and thus present opportunities for entrepreneurs). Ongoing R&D continue to refine and evolve these solutions and drive new and innovative solutions.

The sanitation space is changing rapidly, and all stakeholders must keep abreast of new developments and solutions. Doing so will help improve South Africa's ability to deliver safe and sustainable sanitation to all.

*Some sanitation technologies described are being piloted to ascertain their functionality and acceptance before they can be officially registered on the TKC database.

Photo: Infrastructure News

12.2.2 Sanitation technology selection tool

Selecting sanitation technologies corresponding to local needs

In 2021/22, SASTEP commissioned a project to study why some new sanitation systems are not being used and created a suite of tools that can help municipalities to overcome some challenges in implementing water efficient sanitation technologies.

The ***South African Guide for Selection of Appropriate Sanitation Systems*** (see Figure 12-2), which is available at https://www.wrc.org.za/wp-content/uploads/mdocs/3049%20final%20web.pdf, can be used to go through a process of considering and selecting appropriate sanitation technologies in keeping with current circumstances. The guide also includes a compendium of typical sanitation systems and technologies used in South Africa and assists in addressing typical challenges that municipalities face, including writing a sanitation policy, developing procurement processes for alternative sanitation systems, and advocating for alternative sanitation systems.

FIGURE 12-2: COVER PAGE OF SOUTH AFRICAN GUIDE FOR SELECTION OF APPROPRIATE SANITATION SYSTEMS

The accompanying **SaniSelect spreadsheet-based decision-support tool** (see Figure 12-3) can be used to go through the criteria and required data elements and to gain an overview of needs and corresponding appropriate technologies.

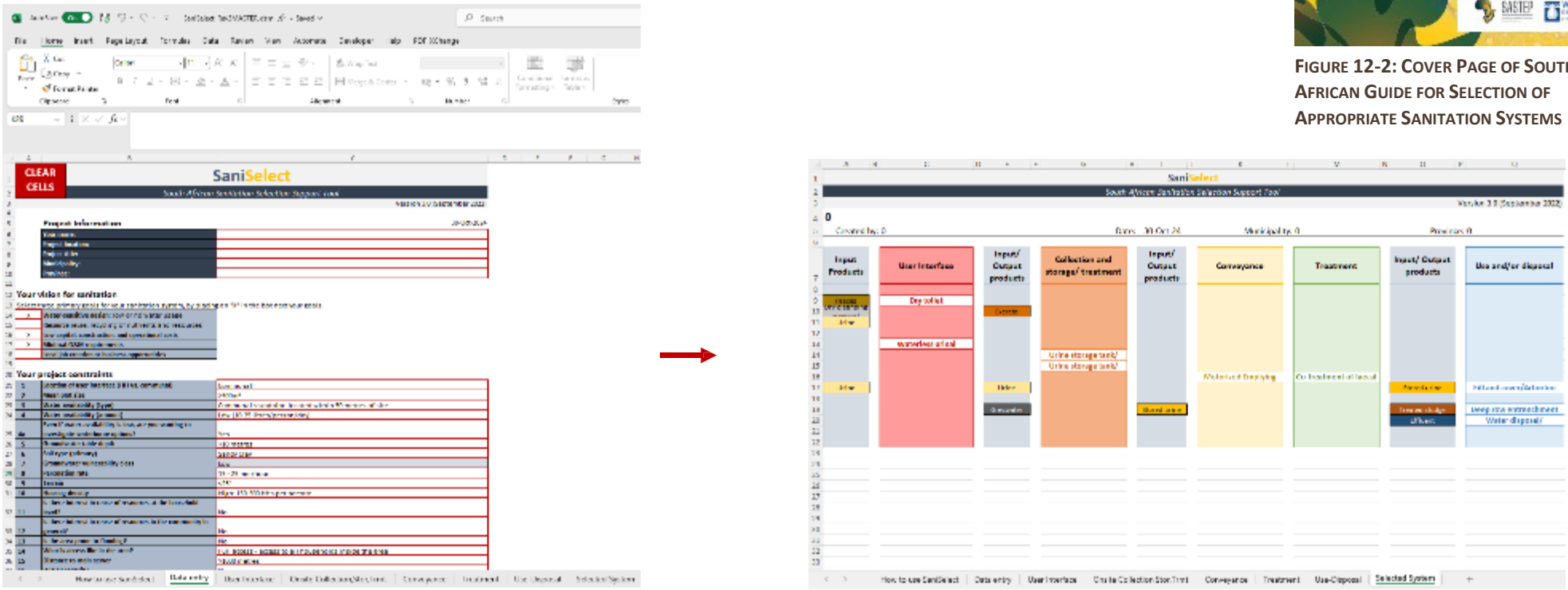


FIGURE 12-3: SCREENSHOTS FROM THE SANISELECT SPREADSHEET-BASED DECISION-SUPPORT TOOL

These tools are a useful starting point to assist municipalities and other decision-makers in taking steps towards more sustainable and appropriate sanitation technologies.

12.3 Revised norms and standards (draft)

To improve sanitation services in a rapidly changing world, a new set of rules is needed.

- DWS has worked with key stakeholders to develop the Revised National Water and Sanitation Services Norms and Standards to drive reliable and sustainable sanitation.

Sanitation-specific requirements in the Revised National Water and Sanitation Services Norms and Standards include inter alia the following:

- Specifies requirements for the provision of interim sanitation services (e.g. within informal settlements)
- Specifies requirements for the provision of basic sanitation services (including the need for hygiene and user education and required frequency for emptying on-site sanitation facilities)
- Considers appropriate technologies for different settlement conditions-, and factors such as population size, risks to groundwater pollution, and economies of scale, and sets the new minimum standard for sanitation services, for example:
  - In dense formal settlements ➔ waterborne sewered sanitation (provided that the WWTWs have adequate capacity or equivalent solutions that are innovative or emerging, which are off-grid (NS), use little or no water and involve the on-site treatment of human waste. These solutions must provide the same level of service to the user as a conventional waterborne sewered system.
  - In medium-density formal settlements ➔ waterborne sewered sanitation (provided that the WWTWs have adequate capacity) or equivalent solutions with lower-cost wastewater treatment solutions.
  - In low-density or sparsely populated settlements ➔ NS solutions that meet minimum standards.
- Specifies that all new settlements and developments should use water-efficient sanitation solutions
- Identifies the need to recalculate the sanitation backlogs and finance requirements against the revised norms and standards
- Outlines requirements for the provision of emergency sanitation services and of sanitation services in public places
- Specifies regulations relating to compulsory national standards for qualifications for process controllers at WWTWs and minimum qualifications and experience requirements for wastewater treatment plant managers
- Specifies competency requirements for various heads and managers of a water services authorities
- Specifies regulations related to FSM (for on-site sanitation solutions) to ensure safe FS emptying, transportation, treatment, disposal and beneficial use
- Specifies regulations related to the quality of water discharged into a water service system or water resource system, including greywater management requirements
- Provides details of water service audit requirements, including reporting requirements for the entire sanitation service chain

Available at
https://www.gov.za/sites/default/files/gcis_document/202401/49979gon4246.pdf

16 No. 49979 GOVERNMENT GAZETTE, 12 JANUARY 2024

DEPARTMENT OF WATER AND SANITATION

NO. 4246 12 January 2024

WATER SERVICES ACT, 1997

PROPOSED COMPULSORY NATIONAL WATER AND SANITATION SERVICES NORMS AND STANDARDS

The Minister of Water and Sanitation, under section 9(1) of the Water Services Act, 1997 (Act No. 108 of 1997), intends to make the regulations in the Schedule.

Interested persons are hereby invited to submit, within 60 days from the date of publication of this Notice, written comments or representations on the proposed regulations to the Director-General, Department of Water and Sanitation, Private Bag X313, Pretoria 0001; email: CommentNorms5tds@dws.gov.za (For attention: Anet Muir).

MR SENZO MCHUNU, MP
MINISTER OF WATER AND SANITATION
DATE 24/1/23

Figure 12-4: First page of the Revised National Water and Sanitation Services Norms and Standards

12.4 SANS 30500: 2019 for non-sewered sanitation systems

Ensuring that a non-sewered sanitation system meets safety and performance requirements

South African National Standard (SANS) 30500 (SABS, 2019) was adopted from International Organization for Standardization (ISO) 30500, which was developed with inputs from international experts from 46 countries. Compliance with the standard means that prefabricated integrated treatment units adhere to the general safety and performance requirements for design and testing.

This is a product standard that specifies general safety and performance requirements for design and testing and sustainability considerations for non-sewered sanitation systems (NSSSs). It contains criteria for the system's safety, functionality, usability, reliability, and maintainability, as well as its compatibility with environmental protection goals. The quality of the outputs from the sanitation system are given for solid discharges, liquid discharges, odour, air emissions, and noise emissions.

The standard is applicable to sanitation systems that are manufactured either as one package or as a set of prefabricated elements designed to be assembled in one location without further fabrication or modification that influences the system function. The standard also covers NSSS backend components that are designed to be integrated with one or more specified frontends.

The benefits of adopting the SANS 30500 include the following:

- Saves time and money
- Helps ensure that policymakers can rely on global expert opinions to ensure that products are safe for citizens without having to spend their own time and money
- Ensures that manufacturers have a blueprint they can use to create products that meet international guidelines, making market entry easier
- Increases user confidence in the product, since it reflects a consensus of regulators, manufacturers, and users from across the world
- Increases the ability to widely manufacture and market technology and deploy it where it is needed most
- Facilitates free and fair global trade due to an internationally recognised system and faith in the standards
- Enables regulators and government institutions to tap into a constantly updated source of information and experiences
- Allows users of these toilets to have a dignified, reliable, safe, hygienic, odour-free experience that may even produce by-products that can be re-used by the community

Part Q of SANS 10400 (Application of the South African Building Regulations) identifies SANS 30500-compliant toilets as an acceptable alternative.

What is a non-sewered sanitation system?

An NSSS is a prefabricated integrated treatment unit with a:

- Front-end component (toilet facility) and
- Back-end component (treatment facility)

The NSSS collects, conveys, and fully treats the specific input within the system, to allow for safe reuse or disposal of the generated solid, liquid, and gaseous output, and is not connected to a networked sewer or networked drainage system.

NSSSs can be implemented where increased sustainability is desired (e.g. public toilets, national parks, green buildings) and where conventional sewer options and on-site solutions are unavailable or impractical (e.g. rural communities, informal settlements).

Why is a standard necessary?

- Protects human health and safety and the environment
- Assures governments, regulators, companies and consumers that products and services are safe, effective and reliable
- Facilitates the dissemination of knowledge and good practices
- Facilitates innovation
- Limits the duplication of efforts
- Serves as strategic business tool to reduce costs by minimising waste and increasing productivity

12.5 Faecal Sludge Management Strategy

What is being done to manage faecal sludge?

The National Faecal Sludge Management (FSM) Strategy, available at https://www.dws.gov.za/Documents/PRINTERS%20FINAL%20=%20FSM%20Strategy%202023.pdf, encourages sustainable sanitation management along the sanitation service chain to prevent health hazards and protect the environment. It also enhances the operation and maintenance of on-site sanitation systems and prevents groundwater contamination.

The vision of the FSM Strategy is to establish sustainable management and regulatory frameworks for FSM in order to ensure its collaborative implementation by the sector.

The overall objective of the strategy is to mainstream FSM as part of sanitation services in South Africa. Further objectives include:

- To respond to the provisions of SDG 6.2 and associated targets
- To establish clear regulatory and financing frameworks for FSM across the service chain
- To establish an enabling framework for private-sector opportunities in FSM service provision
- To provide strategic guidance to water service institutions in relation to the management of on-site sanitation
- To promote the beneficial use of FS as a resource that could help create jobs and economic opportunities

FIGURE 12-5: COVER PAGE OF THE NATIONAL FAECAL SLUDGE MANAGEMENT STRATEGY

The six pillars on which the FSM Strategy is based are as follows:

1 Policy, legislation, regulation and enforcement
2 Institutional arrangements
3 Planning
4 Financing
5 Capacity, technical assistance and technology
6 Promotion and user engagement

FS is the contents emptied from an on-site system and not transported by sewers. It includes liquid and solid contents of on-site systems such as container-based vaults, pit-latrines, septic tanks, community toilets, or mobile toilets. FS differs from other sludges that are products of the wastewater treatment process.

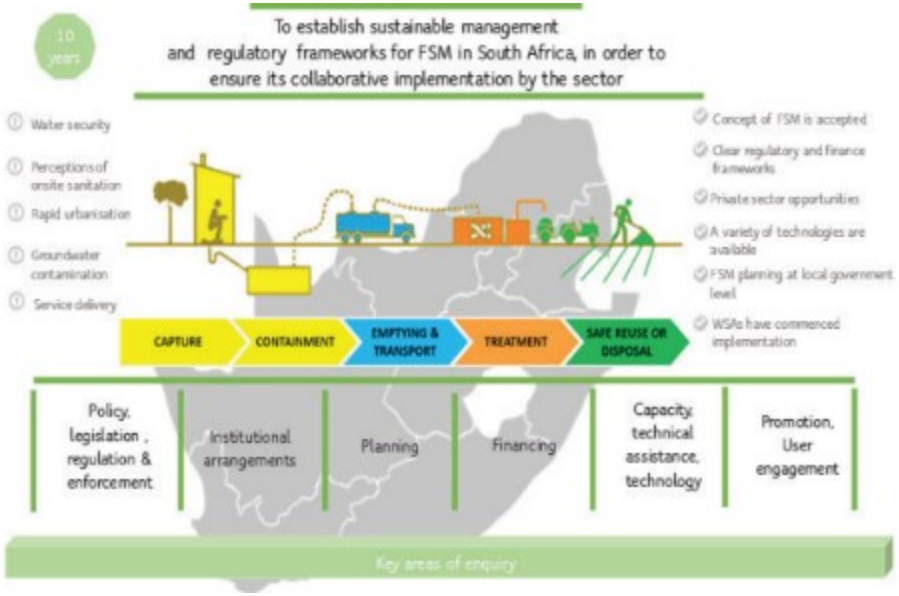


FIGURE 12-6: CONCEPTUAL FRAMEWORK FOR FAECAL SLUDGE MANAGEMENT IN SOUTH AFRICA OVER THE NEXT TEN YEARS

The sanitation service chain guides the scope of the FSM Strategy:

1 **Capture and containment** to develop, demonstrate and validate alternative waterless and off-grid sanitation solutions
2 **Emptying and transport** to ensure that safe, affordable, and sustainable emptying and transport services are available to all users of on-site sanitation systems
3 **Treatment** to ensure that all FS is safely received and treated at appropriate treatment facilities
4 **End-use and disposal** to establish an enabling framework for the beneficial use of FS products and the safe disposal of faecal waste

12.6 Wastewater risk abatement planning for climate resilience

What happens to a wastewater treatment works when it floods?

Wastewater risk abatement plans, or W_2RAPs, have been part of the South African sanitation landscape for more than 10 years. It is essential that W_2RAPs be kept up to date and reflect current circumstances within municipalities. One aspect of increasing importance is that of climate resilience.

A W_2RAP is a risk-based assessment that aims to identify wastewater-related risks and to ensure that effective plans are put in place to reduce the impact of these risks, thus ensuring that wastewater is adequately 'collected, treated and discharged or reused' (Van der Merwe-Botha and Manus, 2011). Simplistically, the W_2RAP process could be described as a water safety plan (WSP), but for wastewater. In South Africa, the W_2RAP process is a requirement for DWS Green Drop certification (Van der Merwe-Botha and Manus, 2011). There are three essential components to the W_2RAP process: wastewater system assessment, risk assessment, and risk management.

There is a need for the W_2RAP processes to include climate resilience, as the uncertainty of climate change may result in systems being under- or overcapacitated and unable to respond effectively (to an increased or reduced hydraulic load, increased concentration of contaminants, etc.). Municipalities, however, struggle to interpret and incorporate climate data into their planning activities. Given the urgency of climate change impacts to South Africa, the WRC initiated a project to help develop an easy-to-use and robust methodology that could empower water service institutions to take the necessary first steps to build climate resilience.

WRC recently developed a guideline that facilitates the incorporation of climate resilience into W_2RAP (De Souza et al., 2022). The approach considers the incorporation of climate resilience into the relevant subcomponents of the W_2RAP. This guidance note has been developed to help fill the gap faced by municipalities through an easy-to-follow practical methodology that describes how to access, collate, interpret, summarise, and integrate climate information into the W_2RAP.

Using effective risk management approaches such as wastewater risk abatement planning, supported by insights from SFDs and the FSM Toolbox, provides municipalities with a proactive, flexible and robust approach to assess and manage current and future risks (both climate- and non-climate-related).

The approach developed considers readily available tools such as the GreenBook, which is available at https://greenbook.co.za/

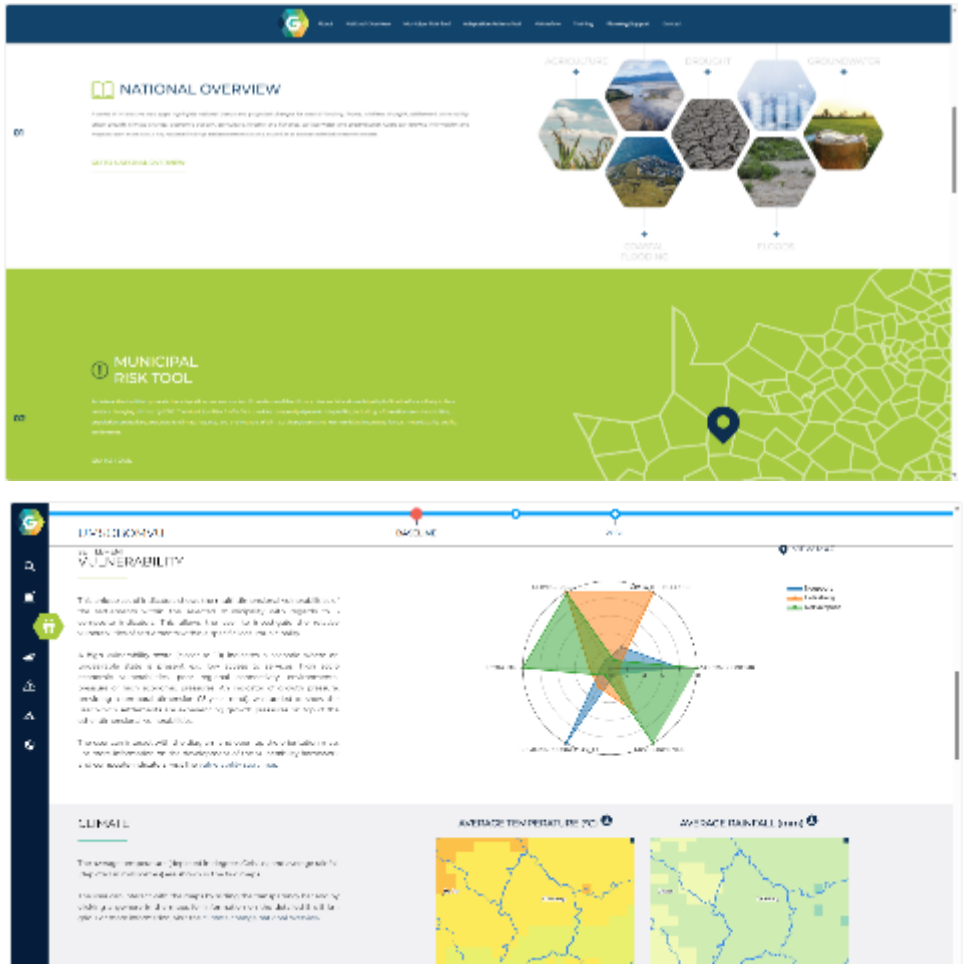


FIGURE 12-7: SCREENSHOTS FROM THE GREENBOOK WEBSITE

12.7 Sanitation safety planning

What is the difference between sanitation safety planning and wastewater risk abatement planning?

Sanitation safety planning is a step-by-step risk-based tool to ensure that sanitation systems are safely managed. In 2015, WHO launched the Sanitation Safety Planning manual. The manual was updated to reflect global experience and reissued in 2022.

As the sanitation sector moves towards 'safely managed sanitation' under the SDGs, actors in FSM need to consider what 'safely managed' means for the service delivery model and how it can be incorporated into daily operations with all actors along the sanitation chain. Sanitation safety planning assists users in systematically identifying and managing health risks along the sanitation chain and prioritises system improvements and monitoring based on health risks. It provides assurance to authorities and the public on the safety of sanitation-related products and services based on sound management and monitoring processes. Importantly, the Sanitation Safety Plan (SSP) coordinates efforts of stakeholders along the sanitation chain. Key observations from the development and implementation of the SSP include the following:

- It is complex, with many interdependencies and various role players.
- Coordination and the assigning of responsibilities could be challenging.
- Controlling actions and adequate monitoring are essential (but also potentially challenging).
- Although South Africa has a high proportion of formal sanitation systems and associated wastewater risk abatement planning/Green Drop associated processes at most municipalities, there are gaps in current South African practices. The SSP is therefore relevant and will be beneficial. It is therefore necessary for DWS to amend their current approaches to consider sanitation safety planning aspects. Section 11 of the Revised National Water and Sanitation Services Norms and Standards notes the need for sanitation safety planning as follows:

  Sewer Collection, Wastewater Treatment and FSM

  11. (1) (a) A Water Services Institution responsible for the collection and treatment of wastewater and FS, must ensure that the environmental risks are identified and climate resilient SSPs and a W_2RAP is developed and implemented accordingly.

  (b) The SSPs, and a W_2RAP must be developed in accordance with the W_2RAP guideline (Van der Merwe-Botha and Manus, 2011) (Annexure A) and must be biennially reviewed as a minimum and reported to the Department. The revised plan must be submitted to the Minister using the national integrated regulatory information system within 30 days of approval by an accounting officer or the person delegated.

Considering this requirement, it is important that the sector be geared towards developing and implementing appropriate sanitation safety planning. A key issue is that municipalities probably cannot take full responsibility for all aspects of the SSP chain (compared to the W_2RAP chain). As a starting point, municipalities should expand their current W_2RAP process, and recently established catchment management agencies (CMAs) should consider other aspects of the SSP that fall outside municipal jurisdiction. DWS and DoH also need to be involved in driving this process.

FIGURE 12-8: MODULES FOR SANITATION SAFETY PLANNING (WHO, 2022)

12.8 Wastewater reuse

Treated wastewater may already be reused for irrigation or industrial purposes, but has reusing treated wastewater for potable use been considered?

Wastewater reuse is an effective strategy to complement and extend water security, resilience and sustainability efforts.

The reuse of wastewater is the practice of using untreated, partially treated or treated wastewater for resources, including potable and non-potable water, irrigation water, nutrients, energy, and heat value. The reuse of treated wastewater for potable purposes is increasingly seen as one of the solutions to deal with water scarcity in South Africa. Wastewater reuse has been effectively implemented in countries such as Namibia, Singapore, Australia, and the USA.

Water re-use for potable purposes can technically be performed by using an indirect or a direct approach. Indirect potable reuse (IPR) is based on treating the used water and discharging the treated water to a natural or man-made stream, dam, aquifer, etc. before abstraction and use by a second downstream water user. Direct potable reuse (DPR) treats the used water to a level that is fit for direct use by a second water user. The treated water is then supplied directly to the second user (without an 'environmental buffer').

There are five key considerations that affect choices related to water reuse as an option for water supply and augmentation (Swartz et al., 2022):

- Water quality and security of supply (never compromise health to reduce cost)
- Water treatment technology (multi-barrier approach, ensure availability of skills and financial resources)
- Cost relative to other water supply alternatives (life cycle costing is essential)
- Social and cultural perceptions (public acceptance, image of reuse)
- Environmental considerations (residuals disposal, energy consumption, environmental benefits)

The key components of a potable reuse programme include:

- Regulatory considerations
- Technical issues related to the production of safe drinking-water
- Public outreach

The success of any reuse project depends on the attention given to each of these key components. Public perceptions are a significant obstacle to the implementation of this strategy. It is thus important to understand the factors that influence these perceptions to successfully introduce and implement the potable reuse of wastewater. The key challenges of water reuse schemes centre on infrastructure, governance, and institutional capacity, and it is therefore necessary to identify and address the technical, operational and management barriers needed to prevent treatment system failures.

Case Study 1: Windhoek, Namibia

Windhoek, Namibia, was the first city to implement long-term direct potable reuse without the use of an environmental buffer. The first reclamation plant started to operate in 1968. The New Goreangab Reclamation Plant was commissioned in 2002 and provides ~35% of the potable water needs of Windhoek. The Windhoek experience shows that direct wastewater reclamation is possible with a robust design and the use of a multi-barrier approach, comprehensive planning, training and ongoing commitment. Rigorous operational control and continuous monitoring are essential to ensure ongoing successful operation of the plant.

Case Study 2: Durban, eThekwini

The Durban Water Recycling Project is a public–private partnership (PPP) where the municipality successfully implemented a wastewater recycling project for industrial purposes. The plant treats and re-uses domestic and industrial wastewater, which reduces water pollution, while generating a lower-cost resource for industry and reducing the strain on the city's freshwater infrastructure.

Case Study 3: Beaufort West, South Africa

Beaufort West is a town in the arid Great Karoo region with no perennial rivers and a reliance on groundwater. To diversify its water sources and increase water security, the municipality entered into a 20-year performance-based build, operate, and transfer (BOT) PPP concession agreement for the direct potable reuse of wastewater effluent. The water reuse facility is based on ultrafiltration, reverse osmosis, and advanced oxidation technologies, and produces 2.3 ML/d of acceptable quality drinking water.

Case Study 4: Faure, Cape Town, South Africa

The Faure New Water Scheme includes an advanced water purification plant where treated wastewater effluent from the Zandvliet WWTW will undergo a stringent purification process designed to ensure that water is treated to a quality that complies with required national and international standards and guidelines. The planned direct potable reuse scheme will treat up to 100 ML/day and is anticipated to be in production by the end of 2027.

Photo: Veolia

12.9 Sanitation and the circular economy

Can the approach significantly impact the country's economy, environment and society?

Realising the economic value of sanitation is essential for transitioning to sustainable sanitation management. It is not an easy task, and there is no one-size-fits-all solution.

The demand for water (and for food and energy) is expected to intensify in South Africa, resulting in scarcity and shortfalls (and other potential social, health and economic impacts). There is a growing urgency to develop solutions to ensure circularity of limited resources to meet future needs. The circular economy (CE) refers to models of production and consumption that minimise waste and reduce pollution, promote sustainable uses of natural resources, and help regenerate nature. The CE approach can help:

- Address pollution challenges
- Solve other complex challenges (such as climate change and biodiversity loss)
- Accelerate the transition to more resilient and lower-carbon economies
- Create new green jobs

The CE in the sanitation context needs to consider the whole sanitation service chain (containment, emptying and transport, treatment, end-use and disposal) and includes the transformation of sanitation wastes into products, including fertiliser, fuel and clean water. Resource recovery from wastewater is an important component of a circular sanitation economy (CSE). The approach can generate new business opportunities and help improve the sustainability of sanitation (and water supply) services.

Projects that promote some aspects of the CSE have been implemented in South Africa (e.g. the generation of biogas from sludge, use of sludge for agricultural purposes, small-scale reuse of wastewater effluent), but the approach is not yet fully embedded. The main barriers inhibiting circular sanitation business models include scalability and financial viability, the selling and marketing of end products, the inability to collect waste and the use of approaches that do not fully treat sludge. Achieving a CSE will require greater commitment and investment by both the public and the private sectors. Significant work is still required, not only to fill technical knowledge gaps, but also to develop appropriate national strategies and policies that will accelerate a successful transition to a CE.

Circular sanitation economy examples (Akinsete et al., 2019)

- Toilets
  - Container toilets with urine diversion
  - Dry-composting toilets
  - Toilets with on-site small biogas reactors
  - Toilets with automated cleaning systems
- Treatment and reuse
  - Collection trucks with built-in dewatering system
  - Anaerobic digestion producing biogas plus residual soil conditioner or organic fertiliser
  - Gas engines converting biogas to electricity
  - Solar-powered conversion of toilet resource into fuel briquettes
  - Air drying of compost in windrows
  - Struvite reactors producing fertiliser from urine
  - Community-scale production of compost and clean water using tiger worms
  - Production of proteins (animal feed) and oil using black soldier fly larvae
  - Pyrolysis suitable for contaminated waste yet still yielding water and biochar

12.10 Energy efficiency and recovery from wastewater and sludge

Can energy security be improved while the burdens of waste disposal are reduced?

Recent electricity shortages and associated high costs have highlighted the risk to sustainable water and wastewater management. Is there an opportunity to improve the situation?

WRC-supported research (Zvimba et al., 2020) has revealed the following:

- About 55% of energy used in the water cycle is for wastewater treatment. The bulk of this energy is for aeration in biological processes, accounting for upwards of 60% of total energy consumption.
- Up to 15% of wastewater energy demand can be offset by biogas generation from sludge and combined heat and power (CHP).
- The adoption of best practices identified in global case studies can help ensure energy efficiency gains of between 5% and 25% in the water cycle.
- Aeration energy savings of up to 50% can be achieved by implementing aeration energy conservation measures at WWTWs.

Based on these studies, most water and wastewater utilities now view energy management as a top priority to ensure long-term sustainability.

Considering this, an increasing number of recent studies have been focused on WWTWs and their potential for recovering valuable resources. These studies have shown that energy efficiency in WWTWs, combined with more efficient use of wastewater energy potential, can lead to energy-positive WWTWs.

WRC research (Van der Merwe-Botha and Visser, 2021) has identified three major classes of wastewater with the greatest potential for energy recovery:

1. Sewage (for both centralised and decentralised systems)
2. Animal husbandry wastewaters
3. Food and beverage processing wastewaters

An estimated 10 000 MWth can be recovered from South African wastewaters, representing ~7% of Eskom's electrical power supply.

Photo: Diego PH on Unsplash

Sludge to energy technologies include:

- **Conventional anaerobic digestion** is well established and is the most implemented technology in South Africa; it's mature technology. Some biogas is used to heat up the digesters when required and the remaining biogas is flared. In the past, flaring the gas was often easier than acquiring the required capital expenditure (CapEx) funding for the CHP turbines required to generate both heat and electricity.
- **Advanced anaerobic digestion** refers to thermal hydrolysis prior to anaerobic digestion. Its advantages include increased biogas yields, reduced reactor digester size, pathogen-free and stabilised digested sludge, improved sludge dewaterability, and a significant reduction in carbon footprint.
- **Hydrothermal polymerisation** involves the use of patented catalysts and proprietary processing methods to produce a polycarbon solid fuel (hydrochar) suitable as replacement for coal in power plants, cement plants and iron smelters. Its advantages include that it entails a carbon dioxide neutral process with no methane production (i.e. low greenhouse gas emissions), involves a wet process (where biomass can be used without expensive pre-drying), accepts a wide range of biomass types (i.e. effective waste management technology), can safely process problematic wastes that currently require expensive disposal (e.g. potential to destroy emerging contaminants such as endocrine disrupting compounds), is a self-contained process with little odour or noise emissions, low investment and operating costs due to moderate temperature and pressure, and straightforward technical operation with no specialist skills needed in the production process (i.e. simple operation), and can be retrofitted in current wastewater treatment infrastructure.

Overall, the optimisation of energy efficiency and use of alternative energy sources from wastewater can significantly increase the national energy resource pool.

Wastewater should be seen as a resource rather than a pollutant or liability, and municipalities should use the current energy crisis as an opportunity to investigate and implement energy recovery and efficiency technologies for wastewater.

Wastewater = resource = water + energy + nutrients

City of Johannesburg: Wastewater to energy

With a steep increase in energy costs, Johannesburg Water has announced plans to commission a biogas plant for power generation at the Driefontein WWTW. It is anticipated that this biogas plant will be able to generate about 30% of the total WWTW's power requirements (Arnoldi, 2023).

Photo: Fré Sonneveld on Unsplash

Nutrient recovery from wastewater

Phosphorous, contained in sewage, is an essential nutrient for all life, particularly in the growth of plants, and is therefore vital to ensuring food security. Currently, phosphorous is mined from non-renewable rock phosphate. Recovering phosphorous from wastewater is an attractive alternative.

12.11 Social franchising partnerships

Can services franchising be the answer to sustainable school sanitation?

The piloting of franchised sanitation services to schools in the Eastern Cape was successful (Wall and Ive, 2013). What lessons can be learnt from this experience? Can similar concepts be applied in other areas?

As an alternative to investment in new infrastructure, franchising is a service delivery institutional concept that could assist in the ongoing O&M of sanitation services. The franchising model structures the operation, facilitates the setting up of the business, and provides the supporting structure thereafter.

Franchising has the potential to deliver sanitation services, increase the quality and reliability of services and the availability and utility of infrastructure, promote job creation, promote local economic development, help create and nurture small, medium and micro enterprises, facilitate the transfer of workplace skills, and assist in black economic empowerment.

The franchising partnerships concept, as it was applied in the Eastern Cape pilot, was an unqualified success in terms of the quality and reliability of service delivered. Since being piloted, the approach has been expanded, and now covers other components of the sanitation service chain, including recycling sludge into beneficial byproducts. The franchisee teams visit schools and collect FS using honeysucker trucks. The sludge is treated via pyrolysis (heating), which kills bacteria and pathogens, and turns the sludge into a safe biochar for soil amendment. The approach has also been expanded to include the provision of hygiene education to schoolchildren and the use of digital tools, where the franchisor has also developed software and mobile apps for franchisees to enable them to lodge reports of problem areas, collect data, map service areas and monitor repairs being undertaken.

Despite the successes of the social franchising model, there are challenges. In particular, the franchise needs to be a financially self-sustainable business, and there is a need in South Africa to create a climate that creates and nurtures such micro-enterprises. By way of example, franchisees are reliant on on-time payment for services rendered and steady cash flow. Income also needs to be sufficient to cover franchisee running and wage costs and associated franchisor fee costs. Ideally, income generated should also be sufficient to build up reserves to cover lean times.

Can a similar approach elsewhere help keep toilets in a good condition?

FIGURE 12-10: COVER PAGE OF SOCIAL FRANCHISING PARTNERSHIPS FOR OPERATION AND MAINTENANCE OF WATER SERVICES: LESSONS AND EXPERIENCES FROM AN EASTERN CAPE PILOT

FIGURE 12-9: COVER PAGE OF SOCIAL SANITATION MANAGEMENT HANDBOOK: HEALTHY TOILETS ARE POSSIBLE

13 Areas requiring attention and sanitation action

13.1 Open defecation in cities

Are public toilets readily available to the homeless? What about other city residents and visitors?

Public toilets are not always readily available or accessible to all city residents or visitors. What options can cities consider?

Open defecation is the human practice of defecating outside (in the open) rather than into a toilet. People may choose fields, bushes, forests, ditches, streets, canals, or other open spaces. People do so either because no toilet is readily accessible or due to traditional cultural practices.

Open defecation pollutes the environment and causes health problems and waterborne diseases such as cholera, typhoid and diarrhoea. High levels of open defecation are linked to high child mortality, poor nutrition, and poverty.

Open defecation in cities may be an even greater health hazard than open defecation in peri-urban and rural areas. This is due to the higher population density, significant level of land covered with buildings and paving, and a higher risk of contact by city residents and visitors. The use of gutters, drains, and verges for defecation and the discharge of cleansing materials and faecal packages result in high levels of contamination of the local environment and stormwater pollution. Recreational areas such as parks with water bodies also become undesirable due to floating waste and excessive water plant growth.

Open defecation in cities, especially by homeless people, is both a complex technical issue that encompasses equitable access to adequate sanitation facilities and a multifaceted societal issue that involves hygiene knowledge, personal safety, privacy, and affordability. There are several reasons and factors that may lead to people defecating in the open or practising open defecation. The main causes of open defecation in cities are a lack of safe and usable toilets, the unavailability of toilets during certain times, the poor location of toilets, the poor quality or non-maintenance of toilets, toilets lacking privacy (with no doors), overcrowding, as well as the absence of water to flush and wash hands after toilet use.

Open defecation linked to street dwellers: Includes city streetwalkers, including the transitionally homeless and some chronically homeless people who were forced into the streets by circumstances. In the absence of reasonable access to public amenities, street dwellers are often faced with no alternative to open defecation.

Open defecation linked to captured or hijacked buildings: In South African cities, abandoned and hijacked buildings are widespread. The owners are often unable to evict non-paying residents and therefore cannot afford to carry out the necessary maintenance and renovations. In many cases, sanitation services in these buildings have ceased. Enforcing by-laws is challenging in that the original owners have lost control of buildings to powerful illegal syndicates.

Open defecation linked to lack of public amenities in central business districts (CBDs) and travel nodes: People move around and through cities for a variety of reasons, including a strong daily movement from urban, informal and peri-urban areas to CBD areas and economic nodes. Reasons for moving around include banking and shopping, looking for job opportunities, being street vendors, watching cars, begging and visiting government amenities such as Home Affairs and courts. A lack of public amenities to serve our universal need to use the toilet often results in people practicing open defecation. No or inadequate sanitation services in public places, including taxi ranks, rail and bus stations, contributes to the increased practice of open defecation resulting in loss of dignity, vulnerability, and spread of diseases. Private-sector facilities, including restaurants and fuel stations, often restrict access to paying customers or charge a fee to keep street dwellers and the poor out.

Photo: Philani Nombembe/TimesLIVE

Section 13.1 provides a summary of data and findings from the **Options to Address Open Defecations in Cities** report.

For access to the full report, scan the QR code above.

13.1.1 What are others doing to address open defecation?

Lessons from abroad

Open defecation is not unique to South Africa. Several other cities have faced similar challenges. What can be learnt from them?

City of Portland (USA) – Sidewalk toilet

In 2017, Portland, USA, addressed open defecation by deploying its first sidewalk toilet in the Old Town, Chinatown neighbourhood. The city evaluated six potential locations for user convenience and visibility, engaging the community through photo exhibits at meetings where attendees provided feedback using sticky notes. This input helped prioritise the site, leading to the installation of the toilet on a busy street near public transit and local businesses. Learning opportunities from this case study include the following:

- Community engagement is an important component in choosing the location of sidewalk toilets.
- Visibility of a toilet facility to potential users is important.
- Proximity to transport hubs is beneficial to users.
- Toilets benefit from proximity to café patrons, as well as motorists who use a parking pay station close by. In turn, proximity to local businesses activity creates safety.
- Sidewalk toilets provide easy access to those walking the streets.

Nigeria – Roadmap for open defecation eradication

In 2016, Nigeria developed a comprehensive national roadmap to eradicate open defecation, addressing the issue faced by over 50 million people. The roadmap outlines various approaches, including capacity development, sanitation marketing for improved technologies, public sanitation facilities, community-led total sanitation, promotional campaigns, and the establishment of multi-sectoral partnerships among government and stakeholders. Learning opportunities from this case study include the following:

- Formulation of a multitude of different approaches for different scenarios.
- Importance of including capacity development to effectively plan and implement the programme.
- Identification of an agreed range of technology options.
- Establishment of a multi-sectoral partnership between government and sector partners.
- Setting of clearly defined timelines.
- Implementation of a programme to review and update the plan on a regular basis.

Paris (France) - Sanisette public toilets

In 2006, Paris eliminated fees for public toilets, which were previously associated with unpleasant conditions and strict attendants. Starting in 2009, the city began replacing old facilities with new Sanisette toilets, designed to offer safe and accessible restroom options throughout Paris. Learning opportunities from this case study include the following:

- Sanisette toilets are designed to accommodate both ambulatory users and users in wheelchairs.
- Sanisette toilets include clear indicators of their availability: ready, occupied, cycling (self-cleaning), or out of service.
- Sanisette toilets may be configured to require coins or to operate for free at the push of a button.
- In some areas, these toilets were misused for crime-related activities, necessitating special attention.

San Francisco (USA) – Pit Stop mobile programme

Since 2014, San Francisco has been operating the Pit Stop mobile program, providing clean and safe public restrooms in targeted sanitation hotspots. These mobile units are staffed by attendants who maintain them and ensure proper usage, and they are equipped with running water, soap, and hand towels. Learning opportunities from this case study include the following:

- The community supports the care of the ‘sanitation with dignity’ facilities.
- The areas are made more liveable due to reduced open defecation.
- Reduced human waste in public spaces resulted in less complaints in the area.
- The mobile public restrooms were supported by a focused plan on public work cleaning in the hot spot areas.

Sydney (Australia) – Automated public toilets

Sydney developed a public toilet strategy to address the needs of day visitors, aiming to provide facilities within 400 metres of central Sydney, village centres, and major parks. The toilets, now frequented by workers, commuters, and visitors, feature self-cleaning mechanisms, automated doors, and a 10- to 15-minute usage limit to deter loitering and antisocial behaviour. Learning opportunities from this case study include the following:

- Toilets are easy to use by all, including the handicapped, and have a braille configuration for the blind.
- Toilets are a secure, accessible facility for public use.
- Toilets have automated cleaning and disinfection.
- Toilets have emergency security provision that prevents loitering.
- Toilets are located close to high-traffic visitor areas, including parks and recreational facilities.

Amsterdam (Netherlands) – GreenPee

In Amsterdam, the issue of 'wildplassen' (outside urinating) is being tackled by means of GreenPee sustainable urinals, which collect urine in a free-standing container made of odour-absorbing natural fibres. This mixture, rich in phosphates, is used as a planter, promoting green urban spaces. Learning opportunities from this case study include the following:

- Urinals do not need water and sewered networks to operate.
- 'Outside urinating' was reduced by 50% with the implementation of GreenPee, which assists in both conserving historical buildings and keeping the city clean.
- Organic fertiliser and urine by-products assist in creating green spaces.
- The GreenPee planters have attracted bees, butterflies and other insects.
- To date GreenPee urinals have targeted the male gender, which is limiting.

Japan – See-through toilet

The Nippon Foundation launched the See-Through Toilet project in Japan to transform the perception of public restrooms. When occupied, the glass becomes opaque, ensuring privacy while signalling that the facility is in use. This innovative design addresses cleanliness and safety concerns, allowing visibility when unoccupied, making it an accessible and hygienic option for locals and tourists in bustling areas. Learning opportunities from this case study include the following:

- The toilets are safe and clean and privacy due to the innovative features of walls becoming opaque has proved popular with users.
- The changed image of public restrooms being clean and comfortable has increased Japan's acceptance of public facilities.

Photo: Exeloo

13.1.2 Proposed actions to end open defecation in cities

Lessons learnt from national and international experience can help end open defecation in cities

Proposed actions to provide easily accessible sanitation services to homeless city residents

1 Establish multi-stakeholder committees to address homelessness and public ablution facilities in all cities. This requires partnerships between the government, the private sector, and civil society (local non-governmental organisations (NGOs), community-based organisations (CBOs), non-profit organisations (NPOs), and civic organisations, for example).

2 Undertake research and development of technological options and sociological drivers to support city programmes for the provision of public sanitation services. This could include combination units of a toilet and a shower with wash basin and optional recycling of wash water for toilet flushing.

3 Compile guidelines and minimum standards for the provision of public toilets that are conducive and suited to the needs of homeless city dwellers in different situations. This must include the cleaning, care and maintenance of these facilities, and hours of accessibility.

4 Develop and implement hygiene programmes to raise awareness and educate people about their hygiene practices and how those affect their health and the environment they live in. Such programmes will inculcate the knowledge on how important the environment is to people's livelihood and health, and the negative impact open defecation has on the environment and their own health. Such programmes will be adaptable for different environments and situations of each city.

5 Assess effective financial options for funding the design and construction of new facilities and the upgrading of existing facilities, as well as for the ongoing O&M of the facilities.

6 Ensure the sustainability of public toilet facilities. The private sector with interests in the economy of the city businesses could be encouraged to invest in the public toilet revitalisation initiative, as it will also benefit them. Advertising space could be sold to businesses that want to increase their customer reach. Money raised from private-sector investments and advertising could be used to maintain the public toilets.

7 Formulate model by-laws and regulations that municipalities can incorporate into current related by-laws that discourage open defecation and ensure safe use and accessibility of public toilet facilities.

8 Plan for the needs of people with disabilities.

9 Promote options for maintenance tasks such as cleaning and disinfecting, unblocking, minor repairs, including possible job creation options for local people. Business opportunities related to the maintenance of these facilities could help improve the lives of locals, who could then appoint the homeless for smaller tasks such as the cleaning of toilet facilities.

10 Schedule reviews of progress and impact, and plan for stepwise improvement over time.

Sanitation options for abandoned buildings:

1 Reinstate existing toilets (requires refurbishment of all plumbing).

2 Convert one unit on each level into a shared bathroom facility (requires structural changes and the refurbishment of plumbing).

3 Convert the ground floor into a shared ablution facility (requires structural changes and plumbing).

4 Construct a public toilet close to the building(s).

5 Provide mobile ablution trailers with toilets and clothes washing basins.

Sanitation options for street dwellers:

1 Reinstate existing poorly maintained public toilets (requires refurbishment).

2 Construct new public toilets in 'safe spaces' that incorporate wash basins, refuse bins, and showers. Consider implementing a payment system for access to all facilities (e.g. R2 entrance) but providing free entrance to flush toilets.

Insights from South African cities: Local learning opportunities

City of Cape Town – portable toilets in the CBD

- Portable ablution facilities can be used to address seasonal hotspots.
- A benefit arises from extending the hours during which ablution facilities can be used.
- Some facilities can be placed within short walking distances of homeless hotspots.
- Facilities can be made visually appealing to fit in with the CBD landscape.
- A supporting campaign such as #dignityforall can help highlight the struggles that the homeless face and can thus assist in creating public awareness of homelessness.
- PPPs can play a supportive role in addressing challenges.

City of Johannesburg – tackling building hijacking in the inner city

- Building owners and managing agents can be tracked and summons served to ensure housing stability and fairness in housing practices.
- Bad buildings can be eradicated by developing additional low-income rental houses across the city through inclusionary housing, social housing, and registered landlords.
- The conditions of existing occupied buildings should be improved.
- By-laws should be consolidated so they are effective in dealing with hijackings and allow law enforcement agencies to respond to the problem.
- Concrete law enforcement steps should be taken.
- Partnerships with stakeholders should be strengthened.
- A permanent anti-hijacking unit can be established in the South African Police Service to deal with the hijacking of buildings and slum-lording.

eThekwini Metro – Task Team on Homelessness

- Political leadership can play an important role in harnessing the necessary resources.
- Political leadership can help mobilise important social capital through networks that help unlock much-needed resources.
- Genuine stakeholder partnerships and proper cooperation between local government and its civil society partners can help yield developmental outcomes.

Photo: Ayanda Ndamane/African News Agency (ANA)

Photo: Armand Hough / Independent Newspapers

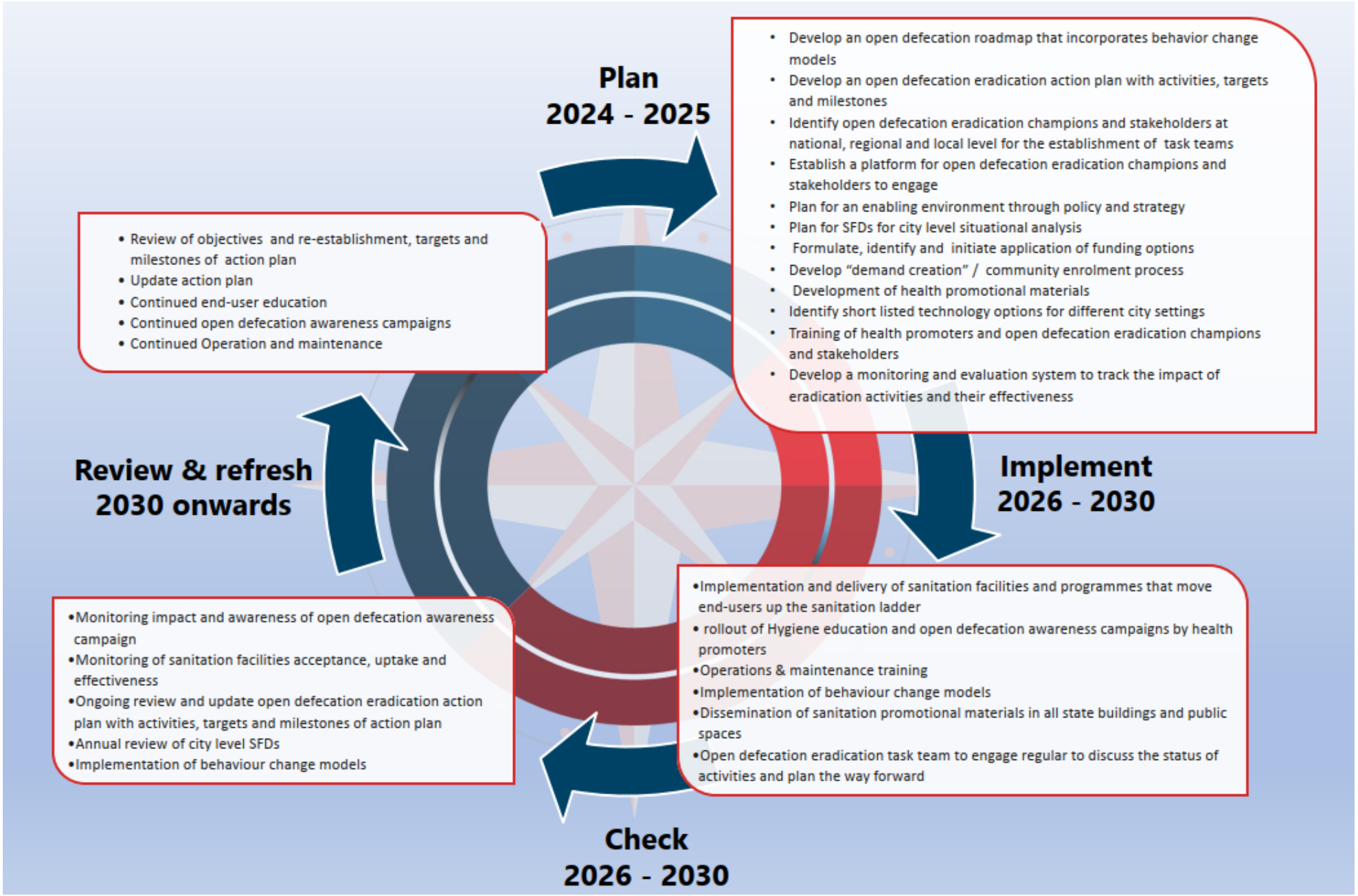


FIGURE 13-1: KEY ACTIVITIES WITHIN THE OPEN DEFECATION ROADMAP

13.1.3 ‘Kickstart checklist’ for ending open defecation in cities

What is the current reality? What first steps are required to address current deficiencies?

In addition to the detailed actions and programmes described earlier, DWS has designed a ‘kickstart checklist’ to initiate and support conversations between stakeholders as first steps in the process of addressing open defecation challenges.

The ‘checklist’ seeks to understand current circumstance (‘reality check’) and identify actions required to address gaps (see ‘kickstart checklist’ assessment criteria).

Addressing the availability gap
Has an assessment of the local context been done using the SFD approach and is the extent of the open defection problem in the city well understood?
In areas of need, are there mothballed facilities that can be reinstated?
In areas of need, has public or private partnering been explored?
In areas of need, does the municipality have a remedial action plan to address the toilet facility gap?

Addressing the location needs
Are hotspots for open defecation serviced?
Is there adequate space available for the construction of toilets or provision of portable toilet facilities?
Is the location of the toilets easily accessible as well as identifiable from sidewalks and the street?
Does the location of toilets serve the needs of transport hubs, government service centres and city visitor hotspots?
Does the location support the needs of vulnerable groups, including women, children, people with disabilities, the elderly, etc.?
Is the location such that the sanitation facility can be safely operated 24 hours a day, 7 days a week?

Quality of experience, including safety
Is the sanitation facility comfortable, hygienic and user-friendly?
Does the facility include handwashing basins and soap?
Are security measures in place to ensure safe use of the facilities?
Are educational materials and programmes available to educate the public on the benefits of using sanitation facilities, and can they be easily deployed?
Can gender- and/or religious-specific needs (such as water for anal cleansing) be met? Will users be encouraged to use the facility?
Does the facility include designated wastebins for the disposal of excreta and diapers from babies and sanitary towels?

Operations and maintenance
Is there a servicing and maintenance schedule in place for existing facilities? Can the schedule be easily adapted for new facilities?
Is there a programme in place to train cleaners and, to ensure the daily maintenance of sanitation facilities?
Is sufficient budget available? Have service providers been appointed for the provision of cleaning materials and agents?

Financing
Can public sanitation facilities be provided free of charge or at a nominal cost (e.g. R2)?
Have both public- and private-sector contributions to public sanitation facilities been put in place? For example, is there advertisement space that can be rented to businesses? Can free Wi-Fi be provided?
Has the budget for open defecation eradication been ringfenced? Is expenditure tracked for the provision of sanitation facilities to the homeless?

Institutional
Has political buy-in been established? Is city-wide public sanitation an acknowledged leadership priority to be addressed and reviewed annually?
Have partnerships been established with NGOs, service providers, local business and potential donors, or can such partnerships be established to increase the rate of provision?
Have targets and timelines been identified for the provision of sanitation to originators of open defecation and will they be monitored and tracked annually?
Are city-wide monitoring and evaluation processes for addressing open defecation integrated into existing services delivery processes?
Have the necessary ringfenced resources (financial, technical, personnel, etc.) been committed to achieve a target of 0% open defecation?

Technology design
Do connections to available services, reticulation, sewer network and electricity have relatively low cost implications?
Can portable waterborne (or other innovative dry or low-water sanitation) solutions be implemented where there is limited space or where few or no service connections are available?
Has a suitable range of innovative options been identified through public consultation where waterborne sanitation to a sewer connection is not feasible?
Does the design of the sanitation facility prevent criminal activity?
Has a shortlist of proven and tested technology options been identified for different city settings?
Can the facility be constructed with local materials? Does its construction limit the import of expensive materials that could delay the process?

13.2 Sanitation delivery model

Review of the current sanitation delivery model

How does the current sanitation delivery model work?

As of 2023, there is a significant sanitation backlog. People are unserved or do not have access to acceptable toilets. The backlog needs to be reduced. What are the options? What is acceptable and legal? What is affordable? What funding is available?

Options are considered and the decision is made:

- A flush toilet connected to the sewer is provided (Is there enough water? Can the sewer system handle the additional volume? Can the WWTWs handle the additional load?)

OR

- Dry sanitation (e.g. VIP) (on-site or NSS) is provided (Are there means to maintain these systems (e.g. emptying)? Where is the faecal sludge treated? Can the WWTWs handle the additional load?)

In many instances, these are the only two solutions considered.

- What about alternative sanitation approaches or innovations?
- Are ongoing operational and maintenance costs calculated before deciding?
- Are climate change impacts considered?
- Do political and other factors influence decision making?

Is this approach sustainable?

If the country continues at the current rate of sanitation service delivery, South Africa will not achieve the SDG 2030 targets. The pace needs to be picked up urgently. Is there a need to repackage the current approach? Are there any innovative changes that could enhance the delivery of current sanitation services?

There is no one-size-fits-all technology

The sanitation situational analysis, conducted as part of the NSIP Project, revealed that all WSAs in South Africa have a mixture of sewered and NSSSs (i.e. no municipality is 100% sewered). This means that appropriate sanitation services to the various settlement types require a mix of both sewered and NSS approaches and technologies. It is unlikely that the same technology will be appropriate for all settlements (i.e. one size does not fit all) and WSAs therefore need to understand their circumstances and the sanitation options and alternatives available and need to analyse the pros and cons of different approaches and what could work within a particular settlement.

Accordingly, the current sanitation delivery model consists of several components designed to meet the specific physical, socio-economic, and service conditions for different parts of the country. The provision of sanitation (and the sanitation technology type implemented) is influenced by aspects such as topography, population density, user acceptance and uptake, affordability, existing systems and/or water availability, considering both the existing circumstances and anticipated changes due to urbanisation and/or population growth.

Ideally, all aspects of the sanitation delivery model should receive adequate attention, regardless of the settlement type. These should be implemented when providing sanitation for each settlement type and due consideration should be given when deciding on the technologies implemented across the sanitation service chain. In some instances, this means that sanitation may need to be provided as part of a package of municipal services associated with housing, including water and roads.

Section 13.2 provides a summary of data and findings from the **Review Sanitation Delivery Model per Settlement Type** report.

For access to the full report, scan the QR code above.

Is the current model working?

The current sanitation delivery model appears to produce results that show that the model is not problematic, and it is potentially a working model.

Results indicate that there are WSAs that have already achieved or are likely to achieve the SDG goals by 2030 (universal access to sanitation). However, many WSAs are off track (i.e. do not yet meet the sanitation delivery targets and do not yet deliver sanitation at an appropriate rate).

Is there a problem with the model?

Not necessarily. It is hypothesised that if the sanitation delivery model is fully implemented following all prescribed enablers, the model will yield the required results. Therefore, the model appears to be ineffective due to a lack of adequate implementation of all the current enablers of the model. If it is implemented properly, the model has the potential to adequately produce desired access to sanitation.

13.2.1 Banning of bucket toilets

Why are bucket toilets still in use?

Bucket toilets should have already been eradicated in South Africa. Yet bucket toilets are still found throughout the country. Bucket toilets are not dignified and DWS is aiming to ban their use.

A bucket sanitation system is defined as a toilet with a bucket or other removable receptable placed directly under the toilet seat for the purpose of collecting urine and faeces (WIN-SA, 2013). Informal settlements are generally provided with bucket latrines (or chemical toilets) by municipalities.

New informal settlements spring up and are being provided with buckets or temporary solutions (such as chemical toilets) by municipalities on an ongoing basis. Alternatively, households in informal settlements build makeshift pit toilets.

Legislation does not allow municipal investment in infrastructure development before the formalisation process is complete. Municipalities must thus wait until the formalisation process has been completed before they can invest in permanent sanitation infrastructure in informal settlements. Settlements must be formalised through a planning process (i.e. Township Establishment by DHS/Cooperative Governance and Traditional Affairs (CoGTA)).

The Bucket Eradication Programme focused on eradicating traditional buckets in formal areas. As informal settlements are formalised, more needs for eradicating buckets (in formal settlements) emerge on an ongoing basis.

In future, DWS will focus on ensuring that municipalities meet the minimum norms for sanitation in informal areas and stop providing buckets. The intent is to:

- Fast-track the removal of buckets in formal areas and support the uptake of innovative sanitation solutions for settlements
- Drive and support the demonstration of innovative alternative sanitation solutions
- Regulate and control the emergence of new buckets
- Formulate new legislation that outlaws the use of buckets

13.2.2 Rise of chemical toilets

Why are chemical toilets an issue?

Chemical toilets are regarded as inappropriate long-term sanitation systems in South Africa. While chemical toilets are intended to meet a short-term need, they are often deployed for extended periods. This can become expensive.

Although hiring and maintaining chemical toilets are the quickest method to address sanitation needs in an emergency or in an informal settlement, the method is expensive and therefore unsustainable in the long term. Despite this, as the number of informal settlements and their inhabitants grow, so too do the numbers of chemical toilets that are deployed. Since 2009, South Africa has seen a **10-fold increase in households served by chemical toilets. Furthermore, the number of households served by chemical toilets has doubled in the last 5 years.** It is imperative that sustainable alternative sanitation solutions be found to replace chemical toilets in informal settlements where there is no sewer network and to alleviate the heavy financial burden on municipalities.

Photo: TROBOLO

13.3 Regulatory framework for on-site and non-sewered sanitation services

Does Green Drop adequately consider non-sewered sanitation?

Green Drop certification is an incentive-based regulation process aimed at addressing sanitation-related challenges. Although Green Drop has been around for more than 10 years, it might not adequately consider all aspects associated with NSS components, and the assessment criteria must be reviewed and revised.

Green Drop certification was first introduced in 2008 and was carried out biennially up to and including 2013, when the programme was temporarily suspended. The programme resumed in 2021. Where WSAs score at least 90% against KPAs, they are awarded a Green Drop certificate, which recognises excellent performance. The assessment highlights wastewater business areas per water services authority that requires improvement. The Green Drop criteria are comprised of five core KPAs as well as a bonus KPA, a penalty KPA, and a disqualifier KPA, each with its own sub-criteria (DWS, 2021):

- **KPA A – Capacity management**: Including assessment of: (i) number of registered process controllers and supervisors, (ii) maintenance team, (iii) engineering capacity, and (iv) scientific/laboratory staff.
- **KPA B – Environmental management**: Including assessment of: (i) risk management process (e.g. W_2RAP), (ii) operational and compliance effluent monitoring, sludge monitoring and classification, and (iii) lab credibility/proficiency testing.
- **KPA C – Financial management**: Including assessment of: (i) operations and maintenance cost determination, (ii) operations and maintenance expenditure against the operations and maintenance budget, and (iii) supply chain management of services and treatment products.
- **KPA D – Technical management**: Including assessment of: (i) operation and functioning of the wastewater treatment system, including the sewer network and pump stations, (ii) wastewater design capacity vs. operational capacity, (iii) process audit, (iv) asset management, and (v) by-law enforcement.
- **KPA E – Effluent and sludge compliance**: Including assessment of: (i) final treated effluent quality (at least 90% compliance with limits for each of the microbiological, chemical and physical determinants), and (ii) sludge disposal in accordance with the classification.
- **KPA F – Green Drop bonusses**: Applied if, for example, implementing additional steps such as process controller upskilling, stormwater and water demand management, upgrades and refurbishment through capital projects, sludge reuse, and additional impact (groundwater or soil water) monitoring.
- **KPA G – Green Drop penalties**: Applied if, for example, operational flow is either significantly below the design capacity (below 40%) or approaching maximum design capacity (99%).
- **KPA H – Disqualifier**: Applied if, for example, information is withheld or if a false impression of performance is presented.

Section 13.3 provides a summary of data and findings from the **Regulatory Framework for Non- Sewered Sanitation Services** report.

For access to the full report, scan the QR code above.

13.3.1 Should Green Drop requirements be amended?

Current Green Drop criteria do not adequately consider the sanitation service chain – this needs to be addressed.

A detailed review of the criteria indicated a need for greater granularity, resulting in additional criteria being developed for NSS-related components and processes. For example, FSM is not adequately addressed in the current Green Drop criteria. Where FS is co-treated at WWTWs, the impact of this on treatment processes is often unmonitored, and loads inserted from vacuum tankers and buckets are not adequately assessed as part of the audit.

To address the gap in regulating NSSSs, DWS has developed a new set of criteria and incorporated it into the Green Drop certification process (see tables alongside with proposed new or amended criteria in red). These new criteria will be communicated to WSAs and rolled out accordingly.

DWS considered existing protocols, standards and assessments, including the following:

- Groundwater Management Protocol
- Compulsory National Water and Sanitation Services Norms and Standards
- SANS 30500: 2019
- ISO 31800: 2020 (faecal sludge treatment units)
- Faecal sludge management (FSM) strategy
- Sanitation safety planning (SSP)
- Excreta flow diagram (SFD)

Photo: SafetyLine

(Proposed new Green Drop criteria included in red)

Key Performance Area (KPA)		Sub-KPA
A	Capacity Management (15%)	A1.1) Registration of Wastewater Treatment Works (WWTW)
		A1.2) Registration of Faecal Sludge Treatment Plant (FSTP)
		A2.1) Registration of Process Controllers and Supervisor at WWTW
		A2.2) Registration of Process Controllers and Supervisor at FSTP
		A2.3) Registration of non-sewered sanitation staff managing emptying, transport and disposal/reuse of FS
		A3.1) Maintenance Capacity for sewered sanitation (e.g. at WWTW and pump stations)
		A3.2) Maintenance Capacity for non-sewered sanitation (e.g. from containment, emptying and transport, treatment (e.g. FSTP) and disposal/reuse)
		A4) Engineering Management Capacity
		A5) (Advanced Systems Only) Scientific Capacity (Sampling and Laboratory Information Management)
B	Environmental Management (15%)	B1.1) Sewered System (Wastewater) Risk Management
		B1.2 Non-Sewered System (Faecal Sludge) Risk Management
		B2.1) Sewered system Operational Monitoring (WWTW and Pump Stations)
		B2.2) Non-Sewered System Operational Monitoring (Containment, Emptying and Transport, Treatment and Disposal/Reuse)
		B3.1) Sewered System Compliance Monitoring (WWTW Effluent)
		B3.2) Non-Sewered Compliance Monitoring (Groundwater Protection and FSTP Effluent)
		B4.1) (Advanced Systems Only) Sludge Classification and Monitoring (at WWTW)
		B4.2) Sludge Classification and Monitoring (at FSTP)
		B5) Laboratory Credibility
C	Financial Management (20%)	C1) Sanitation Operations Cost Determination
		C2) Energy Demand
		C3) Operations & Maintenance Budget
		C4) Operations & Maintenance Expenditure
		C5) (Advanced Systems Only) Supply Chain Management of Service Providers and Suppliers
D	Technical Management (20%)	D1.1) On-site Sanitation Containment Capacity Management
		D1.2) On-site Sanitation Emptying and Transport Capacity Management
		D1.3) WWTW Design Capacity Management
		D1.4) FSTP Design Capacity Management

Key Performance Area (KPA)		Sub-KPA
		D2.1) Process Audit (WWTW)
		D2.2) Process Audit (FSTP)
		D3.1) Sewer Main Inspection
		D3.2) Non-sewered system Inspection/Assessment (containment, emptying and transport, reuse/disposal)
		D4) Sanitation Asset Register
		D5) (Advanced Systems Only) Bylaws and Enforcement (Local Regulation)
E	Effluent and Sludge Quality Compliance (30%)	E1) Monitoring Data Submission to DWS
		E2) Water Use Authorisation
		E3) Effluent Quality Compliance
		E4.1) (Advanced Systems Only) Sludge Quality Compliance (from WWTW)
		E4.2) Sludge Quality Compliance (from FSTP)
F	Green Drop Bonusses	F1) Sewered system staff training (e.g. Process Controllers)
		F2) Non-sewered system staff training (e.g. emptiers/vacuum truck operators)
		F3) Storm Water Management
		F4) Water Demand Management
		F5) Capital Projects planned for upgrades or refurbishment of sanitation system
		F6) Reuse agreements (for effluent and/or sludge)
		F7) Additional Impact Monitoring
		F8) SFD
		F9) Innovative and alternative sanitation technologies
		F10) Public awareness and education
G	Green Drop Penalties 15%	G1) WWTWs operating beyond hydraulic design Capacity
		G2) Any Sewer Collector Pumpstation dysfunctionality causing long term spillage
		G3) Illegal dumping/stockpiling of wastewater sludge/faecal sludge
H	Disqualifier	H1) Withholding information
		H2) Directive Status

Photo: Food Research Lab

DWS is currently developing a web-based Green Drop tool that will seamlessly integrate these new criteria based on the components that comprise the sanitation system being assessed. Therefore, if a system contains only sewered sanitation, NSS assessment criteria will automatically be hidden.

The impact of the introduction of NSS criteria to Green Drop certification audits should not be taken lightly; it will be a significant change to the status quo. The inclusion of NSS criteria into the Green Drop certification audit will be achieved in a **phased manner**, with appropriate accompanying (1) stakeholder advocacy and awareness engagements, and (2) water service institution training and capacity-building to ensure that the sanitation sector is ready and able to respond to the amended criteria. The aim of the approach is to provide sufficient time for:

- Sector stakeholders to grasp and understand complexities around the inclusion of the assessment of NSSSs
- WSAs to improve current monitoring and evaluation systems
- DWS to further refine the criteria through practically testing the draft criteria (through pilot trials at selected WSAs)

The technical site assessment, which entails a physical walkthrough and visual assessment of the sewer network, pump stations and WWTWs, will be expanded to include a physical walkthrough and visual assessment of the NSSS.

Proposed timeline

- 2023 (Certification audit): Initial awareness training; finalise draft criteria
- 2024 (PAT): Awareness training; training materials; piloting; refinement; introduce to teams
- **2025 (Certification audit)**: Awareness training; train teams and WSAs**; introduce NSS criteria as bonus (considering F6, F8, F9 and F10)**; refine; showcase good or best practice
- 2026 (PAT): As per 2025 – refine; prepare for full implementation
- **2027 (Certification audit)**: **Full implementation and integration**; consider bonus criteria becoming core criteria; continue as per previous years
- 2028 to 2030: aim to keep criteria stable; revisit thereafter

13.4 Improving implementation of sanitation innovations

How to ramp up the implementation of alternative and innovative sanitation technologies

An analysis of the Technological Innovation Systems (TISs) Framework has revealed several deficiencies in the sanitation sector. If these gaps are filled, the game might be changed!

Each key process below contributes to building a favourable 'ecosystem' around a new innovative technology. The interactions between the seven system functions fast-track the development and growth of an innovation system.

- **F1 – Entrepreneurial activities**: Entrepreneurs, either new start-ups or existing businesses, trigger social learning processes by testing new technologies, applications and markets, so more information about these can be gathered and the reactions of stakeholders can be gauged.
- **F2 – Knowledge development**: Gaining knowledge about the technology, networks, users and markets and expanding country-specific knowledge through learning activities such as research and development.
- **F3 – Knowledge diffusion**: Knowledge diffusion takes place where actors, from different backgrounds meet and interact (i.e. interactive learning). Knowledge of innovative systems can be exchanged successfully between actors via workshops, conferences, alliances, etc.
- **F4 – Guidance of search**: Guidance of search refers to all activities and events that will convince actors to be a part of the journey. It recognises that resources are limited and that only a limited number of technologies are likely to be selected for further investment.
- **F5 – Market formation**: Market formation deals with the relative markets that can be formed through the implementation of these technologies. These markets can be formed in two ways: by the formation of niche markets for the application of a technology or by the introduction of favourable competitive advantageous measures.
- **F6 – Resource mobilisation**: Resource mobilisation encompasses the human, material and financial capital required to enable technology to be developed and implemented.
- **F7 – Advocacy coalition**: Entrepreneurs and the government need to advocate and vouch for the technology to the actors and communities so that the transition from existing to new technology is easier.

Sanitation economy: Five key trends

1. New toilet technologies
2. Circular economy
3. Sanitation business models
4. Climate resilience
5. Big data and digitalisation

San Francisco has been at the forefront of sanitation innovation, especially in response to water scarcity challenges. Since 2012, the San Francisco Public Utilities Commission has implemented water reuse projects to address sustainability concerns. These efforts aim to reduce reliance on traditional water sources and promote conservation. One notable initiative is the On-site Water Reuse Program, which mandates water treatment and recycling in buildings larger than 9290 m². This program treats blackwater (from toilets) and greywater (from washing) on site, recycling it for non-potable indoor and outdoor uses. As a result, San Francisco has significantly reduced its dependence on centralised water supplies while enhancing the city's climate resilience.

Photo: Mail & Guardian

Section 13.4 provides a summary of data and findings from the **Roadmap for Uptake of Appropriate & Innovative Sanitation Technologies** report.

For access to the full report, scan the QR code above.

13.4.1 Roadmap to improve the uptake of alternative sanitation solutions

Implementing the roadmap will help to overcome current obstacles, thus helping to grow the circular and green economies, develop job opportunities, improve community health and hygiene, and ensure long-term sanitation sustainability.

Analysis of the sanitation technology innovations and uptake in South Africa, conducted as part of the NSIP Project, has shown that:

- Knowledge development (F2), knowledge diffusion (F3) and advocacy coalition (F7) appear to be well-developed functions in South Africa, and these functions tend to be well led by established actors such as the WRC.
- Entrepreneurial activities (F1) are also well supported by actors such as WRC, SASTEP and WADER.
- Guidance of the search (F4) is not as frequently practised in the sector as the other functions.

However, market formation (F5) and resource mobilisation (F6) are deemed to be the least practised functions.

Advocating for alternative sanitation systems (Neethling et al., 2023)

Basic tips for technology developers and/or alternative sanitation advocates to effectively reach decision-makers:

- Be realistic
- Be transparent
- Pilot responsibly
- Pursue certification
- Pursue partnerships
- Listen to stakeholders
- Focus on process
- Educate others about your process

Function	Status
F1: Entrepreneurial activities	Acceptable
F2: Knowledge development	Acceptable
F3: Knowledge diffusion	Acceptable
F4: Guidance of the search	Acceptable
F5: Market formation	Poor
F6: Resource mobilisation	Poor
F7: Advocacy coalition	Acceptable

The roadmap to improve the uptake of alternative sanitation technologies in South Africa considers the five key trends in sanitation economy. Each of these trends highlight a specific aspect of the sanitation economy. The roadmap is aligned with these trends and aims to address the gaps identified through the TIS framework analysis of the current sanitation situation in South Africa.

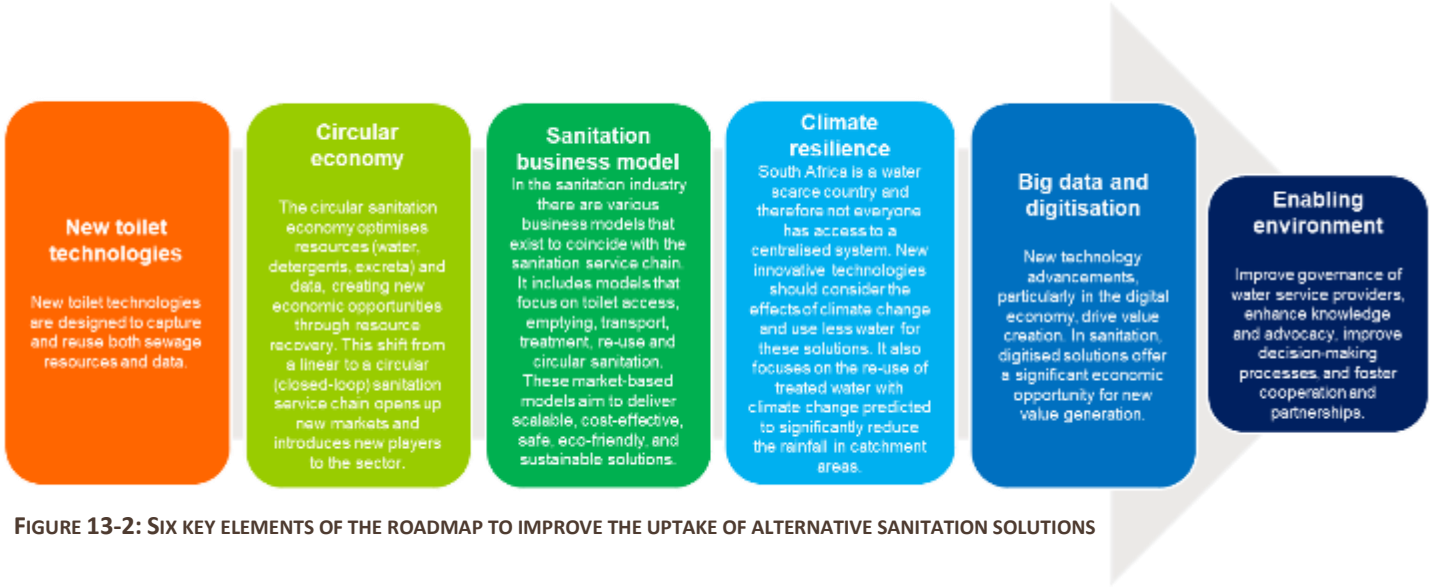


FIGURE 13-2: SIX KEY ELEMENTS OF THE ROADMAP TO IMPROVE THE UPTAKE OF ALTERNATIVE SANITATION SOLUTIONS

13.4.2 Unpacking the roadmap

Who should do what to initiate the sanitation revolution?

Short-, medium- and long-term actions to fast-track the implementation of alternative sanitation solutions have been identified to initiate the sanitation revolution. The short-term actions are presented in Table 13-2.

TABLE 13-2: SHORT-TERM ACTIONS TO IMPROVE THE UPTAKE OF ALTERNATIVE SANITATION TECHNOLOGIES

1. New toilet technologies
DWS: Develop subsidies, with sector partners, for the use of new toilets (instead of chemical toilets) as interim sanitation services for new informal settlements.
DWS: Draft model by-laws that promote the installation of new toilets for new developments, such as low-flush toilets, resource recovery toilets and/or package treatment plants (smaller urban/new developments).
DWS: Develop guidelines and standards for the selection and construction of 'new toilet' systems, including container-based and mobile sanitation systems for households, public institutions and space and commercial sites. The guidelines require that the design enables safe emptying.
DWS: Review model by-laws to include new technologies throughout the entire sanitation service chain.
WSAs: Review by-laws to incorporate new sanitation guidelines and systems.
DWS: Develop micro-finance programmes for rural households.
2. Circular economy
DWS: Draft model by-laws that will make it mandatory to use at least 20% of reusable water for irrigation purposes in metropolitan areas.
WSA: Encourage partnerships between sanitation providers, waste processors, and agricultural enterprises.
DWS: Establish innovation hubs and online platforms that bring together designers, entrepreneurs, and researchers to collaborate on CE products and service design and also to gain knowledge.
DWS: Provide financial incentives, grants, and tax breaks to businesses that adopt CE practices and invest in CE-related technologies.
3. Sanitation business model
DWS: Conduct a thorough assessment of sanitation needs and market demand in different regions to identify opportunities for new business models.
DWS: Establish incubators or accelerators that specifically focus on supporting startups and businesses in the sanitation sector.
DWS: Introduce regulatory sandboxes that allow businesses to test new sanitation models in a controlled environment before full-scale implementation.
DWS/NT: Support grant funding for pilots of innovative and alternative sanitation technologies.
DWS/NT: Incorporate a 3-year service period into sanitation capital expenditure tenders for a period after sanitation system installation/commissioning.
DWS/NT: Request completion of a standard method to specify O&M costs that allows comparison between technology suppliers.
NT: Investigate structural changes (e.g. to the PFMA) to make longer-term service contracts more feasible (if required).
NT/DWS: Investigate and consider alternative procurement processes, including, for example, (i) design-build model, (ii) design-build-operate model, (iii) two-phase tender with multiple technologies: piloting and implementation, (iv) technology provision with a multi-year service contract, and (v) separate contracts for sanitation infrastructure and civil works.
4. Climate resilience
Entrepreneurs: Incorporate climate considerations into the design of sanitation infrastructure, ensuring that systems can withstand extreme weather events such as floods, storms, and droughts.
DWS: Conduct assessments to identify areas and communities most vulnerable to climate impacts. Use this information to prioritise the implementation of resilient sanitation solutions.

DWS: Educate communities about the importance of climate-resilient sanitation practices and provide guidance on how to use and maintain sanitation facilities during climate-related challenges.
DWS: Provide training to sanitation professionals, engineers, and local government officials on climate resilience concepts and practices.
5. Big data digitisation
WSA: Form partnerships with telecommunication industry role players (open dialogue channels).
DWS: Budget for possible infrastructure/equipment (e.g. sensors).
DWS: Develop and implement training for WSA technical teams on the new digital model's approval, inspection, and monitoring.
DWS: Develop and publicise a decision support tool for the new technology options (for WSAs).
DWS: Create a communications platform to advise of new and approved sanitation technologies coming out of testing.
SALGA: Increase opportunities for municipal benchmarking-related engagements (peer learning, sharing lessons learned, case studies).
6. Enabling environment
DWS: Develop stakeholder engagement guidelines for WSAs to identify all innovative technology stakeholders, form a coordinating forum for them, and define and agree on institutional roles.
WSAs: Use the guidelines to engage relevant stakeholders to participate in a coordinating forum.
WSAs: Formally agree on the local institutional framework for new innovative technology uptake, including mandates, responsibilities and accountability.
DWS: Develop an equivalent assessment to the Green Drop for the uptake of sanitation technologies where incentives can be provided for high-achieving WSAs.
DWS: Adopt a technology protocol that will guide technology innovators towards registration on the DWS database.
DWS/NT: Require that appropriate decision-making tools (e.g. WRC SaniSelect) are completed as a prerequisite for funding approval from National Treasury.
DWS/NT: Equip municipalities to write tender specifications that are specific enough to garner technically acceptable solutions while not being too restrictive.
WSAs: Partner with research institutions, independent consultants, or other technology providers in the testing, development, and provision of solutions.
WRC/DWS: Identify current successful reference cases for NSSSs and publicise them.
DWS/WRC: Increase knowledge and awareness of NSSSs at local, provincial and national levels.
DWS/WRC: Make outcomes of pilot/demonstration projects accessible to decision-makers.

13.5 Economic opportunities in the sanitation service chain

Can alternative and improved sanitation drive economic growth?

Can DWS facilitate collaboration between the public and private sectors to stimulate sanitation economic opportunities? Are there case studies of local and international successes and failures?

What is the sanitation economy?

The SE is a market-based approach based on innovative business models and strategic collaborations to provide customer-centric and sustainable sanitation products and services to everyone, everywhere. A thriving SE can be described as one where sanitation, hygiene and menstrual health systems, products and services are provided in a smart, equitable, participatory, sustainable, innovative, cost-saving and revenue-generating manner. In many countries, the SE is a promising, but largely untapped, marketplace of sanitation, hygiene and menstrual health and hygiene products, services, and renewable resource flows. Focused efforts to grow the SE in any country can create a new monetised sanitation provision economy where products and services, biological resources, data and information, to name a few, create a new, innovative and robust marketplace to provide benefits and transform households, communities, cities and businesses. **The SE links three marketplaces, some already existing and others still emerging: the toilet marketplace, circular sanitation marketplace, and smart sanitation marketplace** (see Figure 13-3).

Photo: Toilet Board Coalition

Sanitation market service chain SWOT analysis

A strengths-weaknesses-opportunities-threats (SWOT) analysis was developed for each of the three SE marketplaces.

Based on the SWOT results, DWS developed a roadmap that:

- Leverages current strengths and amplifies opportunities
- Addresses the major threats and weaknesses in the sector
- Transforms the sanitation market with a 'pro-poor' focus
- Addresses gaps and amplifies opportunities
- Maintains current sanitation markets to improve livelihoods
- Ensures the sustainability of natural resources (i.e. protection of water resources and land)
- Considers best practices, including game changers and roadmaps
- Addresses gaps and weaknesses in the existing sanitation market
- Amplifies opportunities and sector strengths
- Addresses current and future challenges (e.g. climate change, water security)

Photo: Creative Commons

Section 13.5 provides a summary of data and findings from the **Roadmap to Stimulate Sanitation Economic Opportunities** report.

For access to the full report, scan the QR code above.

FIGURE 13-3: INTERCONNECTION OF FIVE KEY SANITATION ECONOMY TRENDS (TBC, 2024)

13.5.1 Sanitation economic growth roadmap

How to grow and expand to a thriving sanitation economy

Enabling sanitation business solutions can create significant and rapid positive impact. This process needs to be accelerated and the SE grown.

To achieve a successful, thriving SE, South Africa needs to:

- **Innovate SE value chains** – New and innovative SE value chains need to be explored and encouraged, along with innovative means of sustaining and growing existing value chains.
- **Diversify SE value chain, from inputs to upstream products** – The industry must work with other industries to build local capabilities to produce SE materials and manufacturing inputs. The sector must also work with upstream and downstream value chain partners to expand the product and service that they provide, i.e. infrastructure, sanitary and hygiene products, menstrual products, services, etc.
- **Support economic transformation** – At the core of economic transformation is a structural transformation of the SE, which may be defined as a change, over time, in the sectoral composition of output (or GDP) and in the sectoral pattern of the employment of labour as an economy develops. SE transformation requires an unprecedented level of leadership – rejecting a 'business as usual' mindset and acknowledging that business can achieve transformation only if it sees itself as part of a larger whole.
- **Support social transformation** – In South Africa, transformation has an additional meaning, defined in the Broad-Based Black Economic Empowerment Act (2003) (BBBEE Act) and amendments in 2013, as the empowerment of African, Indian and Coloured people, as well as women, workers, youth, people with disabilities, and people living in rural areas, through: increasing the number of black people who manage, own and control enterprises and productive assets; facilitating the ownership and management of enterprises and productive assets by communities, workers, cooperatives and other collective enterprises; developing human resources and skills; achieving equitable representation in all occupational categories and levels in the workforce; conducting preferential procurement; and investing in enterprises that are owned or managed by black people.
- **Achieve environmental sustainability** – The SE value chain needs to strengthen and develop biomanufacturing products, the use of renewable biobased feedstock and the minimising of natural resource inputs. Products of the sanitation value change need to be focused on addressing the 7 R's (i.e., rethink, refuse, reduce, reuse, repair, regift, and recycle), particularly on recovery, reuse and recycling of these resource within the SE itself or into other sectors of the economy.

The country also needs to ensure an enabling environment of cooperation and collaboration in efforts to develop and grow the SE.

The roadmap for growth and expansion of a thriving SE and value chain in South Africa considers five core pillars. These pillars are necessary to achieve a smart, equitable, participatory, sustainable, innovative, cost-saving and revenue-generating SE.

FIGURE 13-4: FIVE CORE PILLARS OF THE ROADMAP FOR GROWTH AND EXPANSION OF A THRIVING SANITATION ECONOMY AND VALUE CHAIN IN SOUTH AFRICA

13.5.2 Unpacking the roadmap

What 'new normal' is required to take South Africa's sanitation economy into the future?

Five core pillars and associated key actions are necessary to achieve a smart, equitable, participatory, sustainable, innovative, cost-saving and revenue-generating SE.

TABLE 13-3: FIVE CORE PILLARS AND ASSOCIATED KEY ACTIONS TO STIMULATE SANITATION ECONOMY IN SOUTH AFRICA

1. An enabling environment is in place for the SE to grow and thrive.
The regulatory framework at national and local level supports, guides and accelerates the SE.
The necessary skills and the capacity to implement the SE efficiently are in place.
The necessary advocacy and awareness initiatives, structures and plans are in place and are used to raise awareness, share data, and promote the SE.
National and regional private–public collaboration and partnerships are thriving and driving the SE.
Norms, standards and certifications enable the implementation and growth of the SE.
Monitoring and evaluation enable the implementation and growth of the SE.
2. The SE is supported by transformed public- and private-sector financial systems.
Public finance instruments are available to assist in the adoption of the SE approach to the delivery of sanitation products and services.
Financial policy has been reformed to encourage and support research, development, socialisation and deployment of SE products and services.
Local government has adopted innovative financial policy to support growth and accelerate the SE.
The SE is supported by a financially skilled workforce.
The growth of the SE is being driven by active private-sector investment.
3. Innovation and evolutionary thinking inform, build and drive a thriving sanitation economy.
There is a thriving business environment for SMART, innovative, disruptive SE products and services, where sanitation resources (including wastewater and sewage) are used, reused and upcycled efficiently and safely into renewable resources such as energy, power, nutrients, proteins and high-value chemicals.
Consumer demand is actively driving the growth and expansion of SE products and services.
The SE drives the implementation of new, innovative and disruptive business models, process, procedures and frameworks.
4. The private sector is active and thriving and drives the SE in South Africa.
By 2030, the SE value chain will support an increase in the economic goods and services that are produced and consumed.
By 2030, the SE value chain will maintain long-term fiscal strength and stability.
By 2030, the SE value chain will attract and retain businesses that are beneficial to the value chain.
By 2030, the SE value chain will be socially transformed.
Influencers, accelerators and incubators actively support the growth of the SE.
5. Pro-poor value chains and active local participation drive the SE.
Local communities, especially the poor, underpin the growth and development of the SE.
The SE has maximised the participation of the community in existing and new sanitation service chains.
The SE drives equitable and inclusive employment creation at local and national level.

13.6 Climate change impact on sanitation

Are the sanitation systems climate-resilient?

Strengthening climate awareness, improving planning and implementation, and changing behaviours along the sanitation service chain can improve overall community resilience and lessen the impact of climate change.

Climate change-related impacts on sanitation systems include (WHO, 2019):

- **Flooding and increasing precipitation** – public health risk caused by the spread of faecal matter from flooded septic tanks and pits; potential damage to WWTWs
- **Drought and drier conditions** – water shortages restricting sewer system functionality; corrosion of sewers; wastewaters with higher pollution concentrations; reduction in the dilution capacity of receiving waterbodies
- **Sea-level rise** – damage to WWTWs by inundation, flooding, storm surge, erosion and saltwater intrusion, resulting in lower treatment efficiency, higher risk of bypasses and damage to treatment processes from salinity
- **Higher temperatures** – potentially improve wastewater treatment processes (warmer temperatures can accelerate biological treatment); but could increase corrosion of sewers, lead to increased evaporation or fermentation in FS treatment, affecting performance or creating offensive odours
- **Intensity or frequency of storms could increase** – damaging sanitation infrastructure and/or power supplies

Consequently, it is important that WSAs develop adaptive and sustainable responses to the risks and impacts of climate change on sanitation systems.

Instilling these processes requires capacity development to help WSAs think and act differently, and the breaking of silos between sectors, spheres of government, the state, and urban citizens.

Infrastructure choices and investments should be affordable, flexible, and scalable to respond to local needs and changing (and often unpredictable) conditions. WSAs need to meet infrastructure backlogs and address future growth, while simultaneously growing climate resilience. This is a complex challenge, and there currently appears to be limited emphasis on addressing climate change impacts on sanitation systems. It is essential that WSAs understand and assess the challenges they face in relation to climate change (and disaster risk reduction). To drive progressive improvement, it is suggested that peer-to-peer exchanges be initiated where WSAs can learn and share 'best practices' (e.g. learning from other WSAs that have already made some progress in addressing climate change-related impacts).

Finally, it is important to note that alternative and innovative sanitation solutions can contribute to solving these complex problems and help lead to improved climate resilience (e.g. the use of low-flush toilets helps save limited water resources).

Selected climate-resilient sanitation case studies (global) (GWP and UNICEF, 2022)**:**

- Collection, transport, treatment and reuse: Resilient, container-based sanitation in Kenya
  - Excreta is collected hygienically via sealed, flood-proof toilets, which use minimal water
  - Latrines are safely anchored to the ground (to protect them against storms)
  - Excreta are sold to local agricultural markets
- Flood-resilient containment and capture in Peru
  - Dry ecological systems that integrate composting latrines, rainwater harvesting and greywater treatment and retention
  - Systems are elevated, secure and easy to install and use and rely on affordable, locally available and appropriate materials and technologies
- Biogas collection in Nepal
  - Methane produced through anaerobic digestion processes to provide electricity and heating
  - Reduced greenhouse gas emissions, cleaner environment, reduced disease spread and increased availability of low-cost energy for communities
- Constructed wetlands treat wastewater in Pakistan
  - low-cost option to treat wastewater
  - Encourages water conservation and recycling in water-scarce communities
  - Increases biodiversity and beautifies the environment
- Faecal sludge treatment plant produces renewable energy and nutrient-rich soil for agriculture in India
  - Omni processor technology kills pathogens and generates renewable electricity, distilled water and nutrient-rich soil

13.6.1 Climate-resilient development

What is needed to build climate-resilient sanitation systems?

Do municipal plans seriously consider potential climate change impacts (e.g. flooding, drought)? Efforts are needed to ensure that infrastructure choices do not lock us into unsustainable development pathways.

Climate-resilient sanitation refers to sanitation systems (both non-sewered and sewered), services and behaviours that can survive, function or quickly recover in the face of a range of climate-related shocks, chronic stresses and seasonal variabilities, ensuring that faecal matter is safely contained throughout the sanitation service chain and does not contaminate the environment, emit excessive greenhouse gasses or cause risk to public health. Ideally, climate-resilient sanitation both adapts to climate change and mitigates contributions to climate change simultaneously (GWP and UNICEF, 2022).

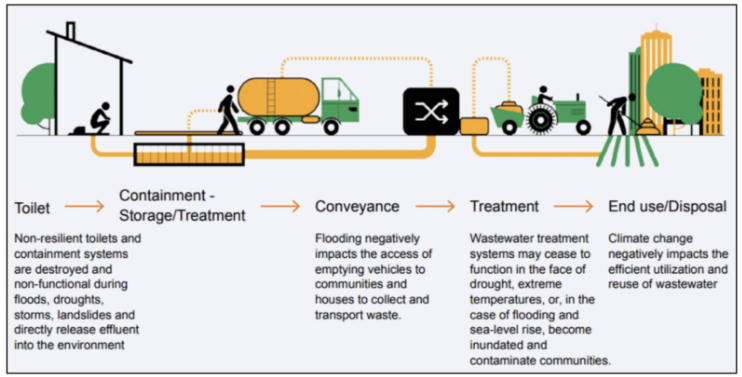


FIGURE 13-6: IMPACT OF CLIMATE CHANGE ALONG THE SANITATION SERVICE CHAIN (KSG, 2024)

FIGURE 13-5: STRATEGIC FRAMEWORK FOR WASH-CLIMATE-RESILIENT DEVELOPMENT (GWP AND UNICEF, 2022)

13.7 Sanitation challenges

What lessons have been learnt? What can be done to fix it?

Despite a mature regulatory framework and appropriate institutional arrangements, the performance of sanitation provision has been sub-optimal and the sector's response to the challenges experienced has room for improvement. The challenges experienced are multifaceted and can be grouped into the following categories:

Resource challenges

- Lack of financial resources
- Lack of human resources
- Poor commitment and engagement of stakeholders
- Poor community awareness of the importance of good hygiene and sanitation management
- Lack of ownership by communities
- Time constraints (bottom-up approach takes longer than top-down municipal-led planning)

Technical challenges

- Poor infrastructure development and maintenance resulting in environmental pollution
- Ineffective systems and procedures for operation and management of sewage and sludge management infrastructure
- Poor monitoring and evaluation = poor data and information = poor decision-making = poor investments

Capacity challenges

- Technical and expert skills not available
- Loss or transfer of trained staff
- No understanding of, and inability to use, available sanitation planning tools
- No community organisation that allows effective engagement in project planning
- Sanitation often not part of the traditional engineering curricula

Institutional challenges

- Poor institutional stability
- Enabling environment with structured, comprehensive, and inclusive planning is lacking
- Poor integrated planning, coordination and cooperation
- Inability to adopt or adapt good and best practices
- Confusion resulting from the existence of many similar sanitation tools for the same purpose

Leadership challenges

- Political will of elected officials to prioritise sanitation and its planning processes is necessary
- Strong leadership to ensure that joint decisions are followed by action

Climate change is likely to further exacerbate these challenges.

What could help to change?

- Strengthening legislative and institutional frameworks?
- Mainstreaming alternative innovative sanitation technologies?
- Focused investment?
- Capacity building?
- Private-sector involvement?

13.7.1 Challenges affecting sanitation service delivery

Multifaceted nature of challenges in sanitation service delivery

Although some success has been observed, this success is not universal, and weaknesses exist as a result of municipal-wide or government- wide challenges in water services. The key issues in sanitation delivery include the following:

- **Political instability at municipalities**: attributed to intra-party disagreements, inter-party disagreements, politicisation and political control of the bureaucracy through patronage; factionalism and patronage negatively affect the ruling party's ability to perform its functions
- **Insufficient revenue collection and generation**: poor revenue collection; unwillingness to pay; inability to pay; insufficient revenue sources; reliance on grants; low- or non-cost reflective tariffs
- **Insufficient skills, tools or equipment and number of staff**: poor spending practices; cadre employment; political meddling; overreliance on outsourcing of engineering staff and contractors; lack of qualified engineering staff
- **Lack of coordination**: government departments operating in silos; no or poor communication between stakeholders and decision-makers; the duplication of efforts or the ineffective implementation of programmes, which may further result in poor buy-in from the receivers of a service
- **Sanitation services provision**: not all WSAs on track to eradicate backlog by 2030; continued population growth, new informal settlements, and a failure to maintain existing sanitation infrastructure are likely to further increase the backlog and push the expected date of eradication further back; theft and vandalism result in funds earmarked for service provision being redirected to address infrastructure damage
- **Rapid urbanisation and population growth**: lead to overcapacitated sanitation infrastructure; impact hygiene practices in places where sanitation facilities are shared; insufficient space available to provide pit latrines
- **Climate change preparedness**: meeting demands of growing population and economic needs; water scarcity; sporadic rainfall; increased temperature, flooding, drought
- **Infrastructure maintenance and investment**: incentives and a willingness to provide new infrastructure, rather than maintain existing infrastructure; perform maintenance under emergency conditions – i.e. not preventative maintenance; lack of strategic asset management; no reliable asset baseline information; poor maintenance; lack of repairs

Overcoming challenges

South Africa has achieved significant success in working towards meeting the target of improved sanitation for all. There remain significant backlogs, however, and at the current rate of delivery, the target of achieving safe sanitation for all by 2030 will not be met. There are various underlying barriers, as detailed in this plan, that need to be overcome as these have been shown to manifest themselves in sanitation service delivery. These barriers are cross-cutting and affect sanitation in all settlement types, albeit disproportionately. Actions to overcome these barriers need to be implemented in those WSAs that are unlikely to meet the 2030 goal for sanitation for all.

13.7.2 Challenges affecting sanitation innovation adoption

Why are sanitation innovations not being implemented? What barriers exist?

Although alternative sanitation technologies are available, they are not readily implemented following piloting. Learning from reflections by the eThekwini Metropolitan Municipality in KwaZulu-Natal, a local and global leader in piloting and implementing alternative and innovative sanitation solutions, can help drive necessary changes.

To enable an effective sanitation market, demand needs to grow, and municipalities and the government need to adopt and roll out new innovations. Challenges have been identified in the adoption process and in moving from testing and demonstration to scale:

Institutional challenges

- Leadership and organisational culture (promoting innovation vs being risk averse)

Skills challenges

- Lack of capacity to assess, understand, and implement new technologies
- Inability to think outside the box, and tendency to stick to tried and tested approaches
- Negative perceptions of NSS due to negative experience with package plants
- Lack of awareness of technology options
- Only happy with incremental changes (e.g. pit toilets to urine diversion toilet)
- Still see sanitation as linear design

Community challenges

- Lack of user acceptance
- Perception that anything besides full waterborne sanitation is for the poor
- Many innovative solutions are equated with a bucket solution
- Unwillingness to pay

Political challenges

- Political instability and coalition governments leading to inaction
- Politicians often force officials to use technology service providers without skills or experience

Procurement challenges

- Systems that rely on specialist maintenance systems are excluded
- Tenders and expressions of interest are often evaluated by staff who are not qualified or have no relevant experience
- Tenders are evaluated mainly based on price and BEE levels rather than functionality and capability
- Significant delays in setting up service level agreements (SLAs) (>12 months); challenging to secure longer-term SLA
- Lack of skills to develop the appropriate specifications
- Manipulation of the bid adjudication process
- Innovators don't fit service provider profiles; also unwilling to give up intellectual property
- Technology evaluation criteria too broad
- Tender specifications are unrealistic or too specific

Policy and budget challenges

- Policy still favours sewers, with very little policy at local level focused on NSS (besides pit toilet options)
- Conflict at municipal level between pressure to provide services and use of innovation to solve problems
- Move to scale is hampered by inability to provide upfront funding

13.7.3 Essential elements for effective sanitation services

What is required? Is it in place?

Are all the building blocks in place to ensure sustainable sanitation services in the long term?

There is no silver bullet to ensure sustainable sanitation. Each province, municipality, city, town or village in South Africa has unique conditions and circumstances that drive its sanitation needs, practices and behaviours. The most appropriate sanitation solution needs to allow for this whilst addressing current challenges and needs.

Importantly, the sanitation sector will continue to struggle if the following essential elements are not in place.

Essential elements for effective sanitation services:

- Enabling policy
- Innovation (product, process, business model, management, social)
- Political support and buy-in
- Competent technical management
- Competent financial management
- Competent technical staff
- Engaged communities (users)
- Trust
- Cooperation
- Coordination
- Communication

Are these elements in place and working effectively?

What needs to be improved?

What needs to change?

What can be learnt from other countries?

Many countries are in a similar position as South Africa. Some countries are developing and implementing innovative approaches to ensure sustainable sanitation provision. South Africa can learn from their experiences and adopt or adapt these approaches to meet its specific circumstances. This can help the country fast-track its sanitation journey.

- A strong institutional setup, including clearly defined roles of stakeholders, helps to facilitate sanitation services delivery.
- Using management instruments and sharing data accelerate learning and increase productivity.
- Building expenditure frameworks that are linked to predefined objectives aids efficiency and reduces costs and losses.
- Projects are more effective when governments and partners involve members of the local community from the outset.
- Innovative financing is vital to support the government's dwindling resources.
- Establish an adequate regulatory and institutional framework.
- Implement a transparent funding framework based on well-defined and achievable objectives.
- Mobilise sustainable funding mechanisms.
- Provide relevant members of staff with capacity-building support.

14 Action plan

What needs to be done?

14.1 Activating the NSIP

How to track the implementation of NSIP commitments

Sustainable sanitation management in South Africa is complex, requiring inputs from many stakeholders. Foundational actions are required in the short term to enable ongoing key actions. If the foundation is not strong, it might fail!

The NSIP promotes the monitoring of key outcome indicators related to high-level goals, together with monitoring outputs associated with the progress toward meeting strategic objectives. This allows the ongoing measurement of progress towards achieving sustainable sanitation by 2030.

To change the current status quo, there is a need to first improve:

- Collaboration
- Coordination
- Communication

These represent foundational actions that need to be prioritised immediately if further key actions are to be implemented.

Foundational actions relate to what needs to happen within 1 to 3 years, and in general relate to providing a platform for holistic collaboration on sanitation management, as well as providing the resources and financing for action and innovation. These foundational actions will also lead to improved performance monitoring by other sector stakeholders, including DBE, DoH and DHS. Training and awareness campaigns will be necessary throughout and prior to the implementation of required actions. The DWS monitoring and evaluation system will need to be operational to ensure the adequate tracking of required performance indicators and achievement of set targets.

As foundational actions are implemented, resources will be available for the effective implementation of the key local-level actions as defined in the municipal-level action plans (or other departmental or provincial plans). The WSAs will implement municipal-level action plans that are aligned to other municipal planning processes (e.g. the Water Services Development Plan (WSDP) and Integrated Development Plan (IDP)).

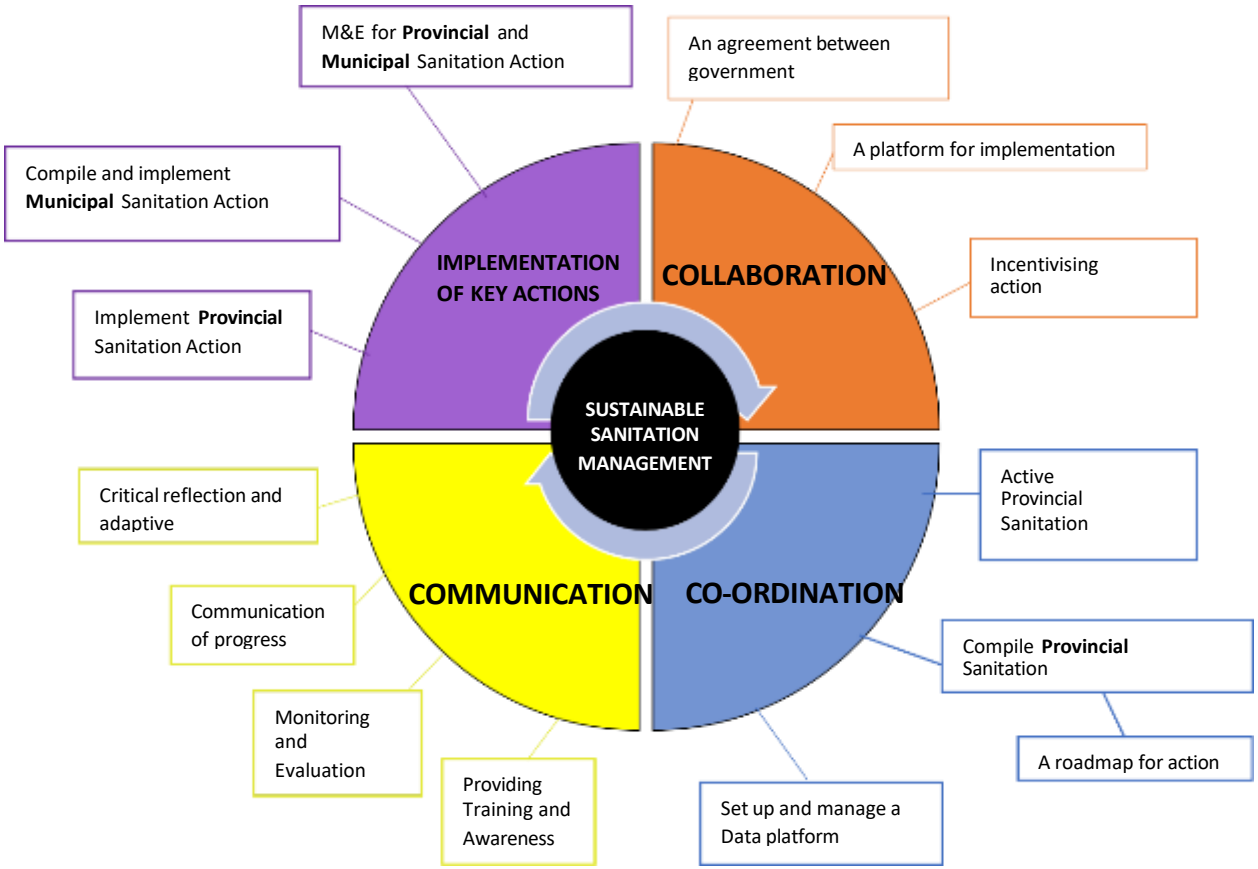


FIGURE 14-1: ACTIVATING THE NSIP

NSIP progress will be monitored via, for example, the National Sanitation Task Team, the provincial sanitation task teams, the DWS Green Drop Certification programme, National Treasury, and Municipal Finance Management Act (MFMA) Circular 88 processes.

14.2 NSIP implementation roadmap

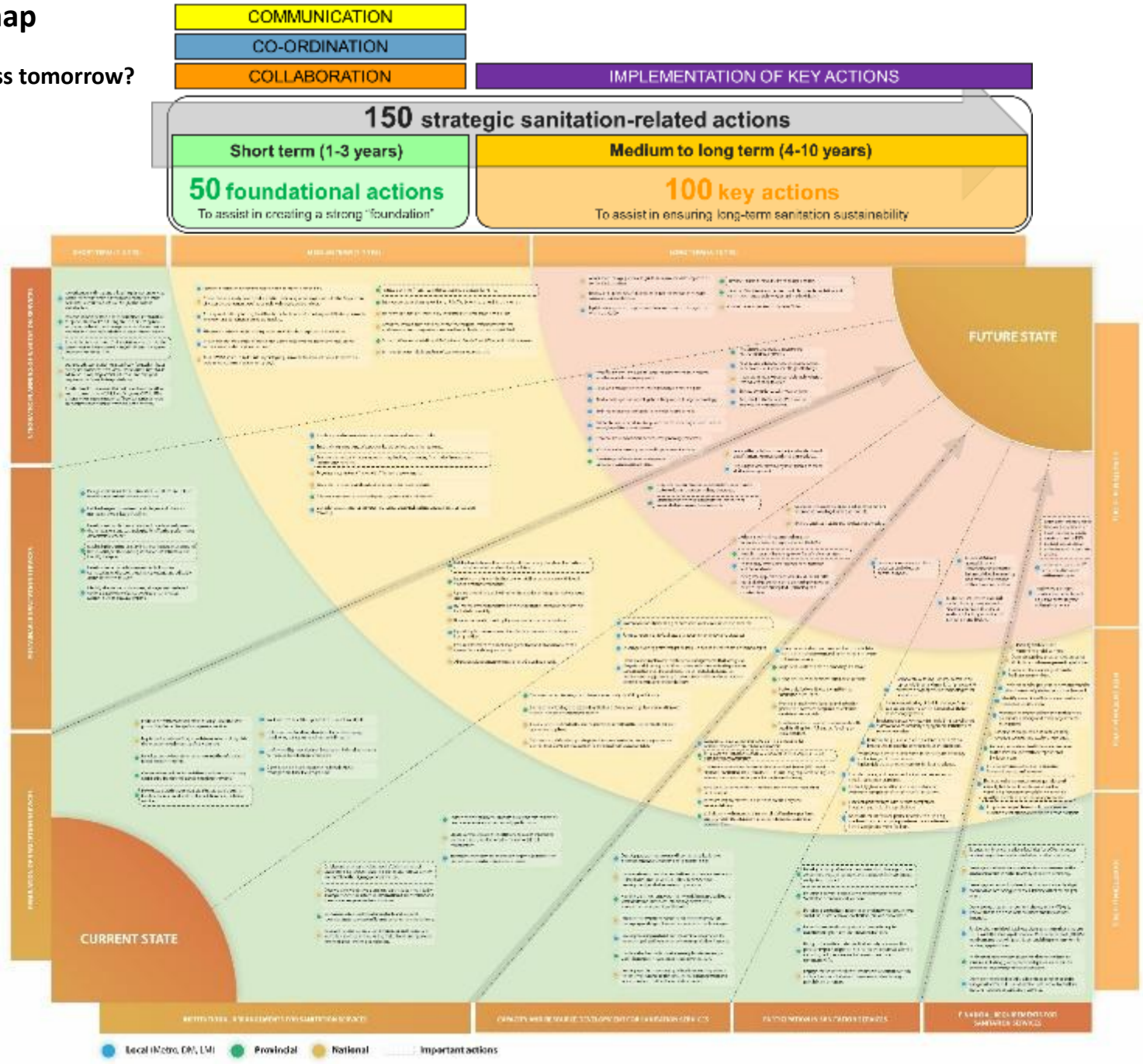
What needs to be done today to ensure success tomorrow?

A consolidated list of actions has been developed through feedback obtained via stakeholder consultation workshops and sector engagements and through a review sanitation-related policies, strategies and plans.

This process has resulted in the identification of some 150 strategic sanitation-related actions (50 foundational actions and 100 key actions) that need to be completed within the next 10 years. DWS will review and update these actions at least once a year to ensure that they remain relevant and yield the required results.

Foundational actions focus on activities required in years 1 to 3. These actions aim to create a 'foundation' to achieve the long-term goals of the NSIP. Thereafter, in years 4 to 10, further prioritised key actions will help to consolidate progress and help ensure long-term sanitation sustainability. The implementation of these actions will follow the traditional 'plan-do-check-act' cycle to monitor progress and track whether implemented actions have the expected impacts.

The implementation of both foundational and key actions is required to drive improved sanitation in South Africa. There is substantial work to be done, and everyone will need to play their part.



14.3 Successful NSIP implementation requires commitment and action by all

A chain is only as strong as its weakest link

It is essential that all stakeholders contribute to improving sanitation in our country, necessitating coordinated efforts at the local, provincial, and national levels.

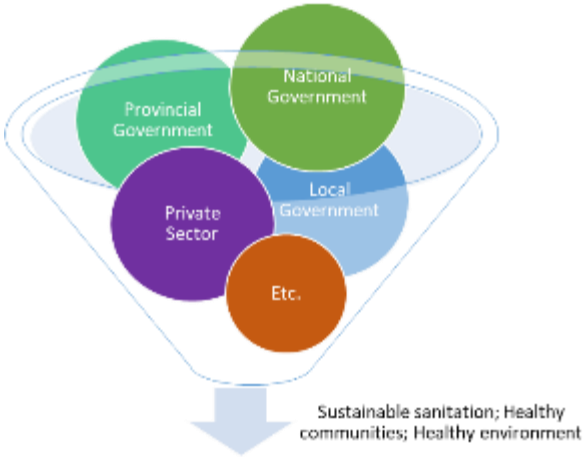


TABLE 14-1: RESPONSIBILITIES OF LOCAL, PROVINCIAL AND NATIONAL STAKEHOLDERS

Local (Metro, DM, LM)	Provincial	National
Develop and implement Municipal Sanitation Action Plan using template and 'shopping list' of potential operational actions Implement local level strategic actions Participate in/provide feedback to Provincial Sanitation Task Team (PSTT)	Implement provincial level strategic actions PSTT track provincial progress with focus on: ■ Provincial foundational actions and key actions, and ■ Local (i.e. municipal) actions Provide feedback to National Sanitation Task Team	Implement national level strategic actions National Sanitation Task Team track overall progress with key focus on national foundational actions and key actions

14.4 Pillar 1: Integrated planning of sanitation services

Lack of integration and coordination amongst the various institutions involved in the provision of sanitation services has resulted in fragmented provision of services. To overcome this, integrated planning is required for the successful provision of sanitation services within both households and public amenities. Top priority actions are as follows:

Short term

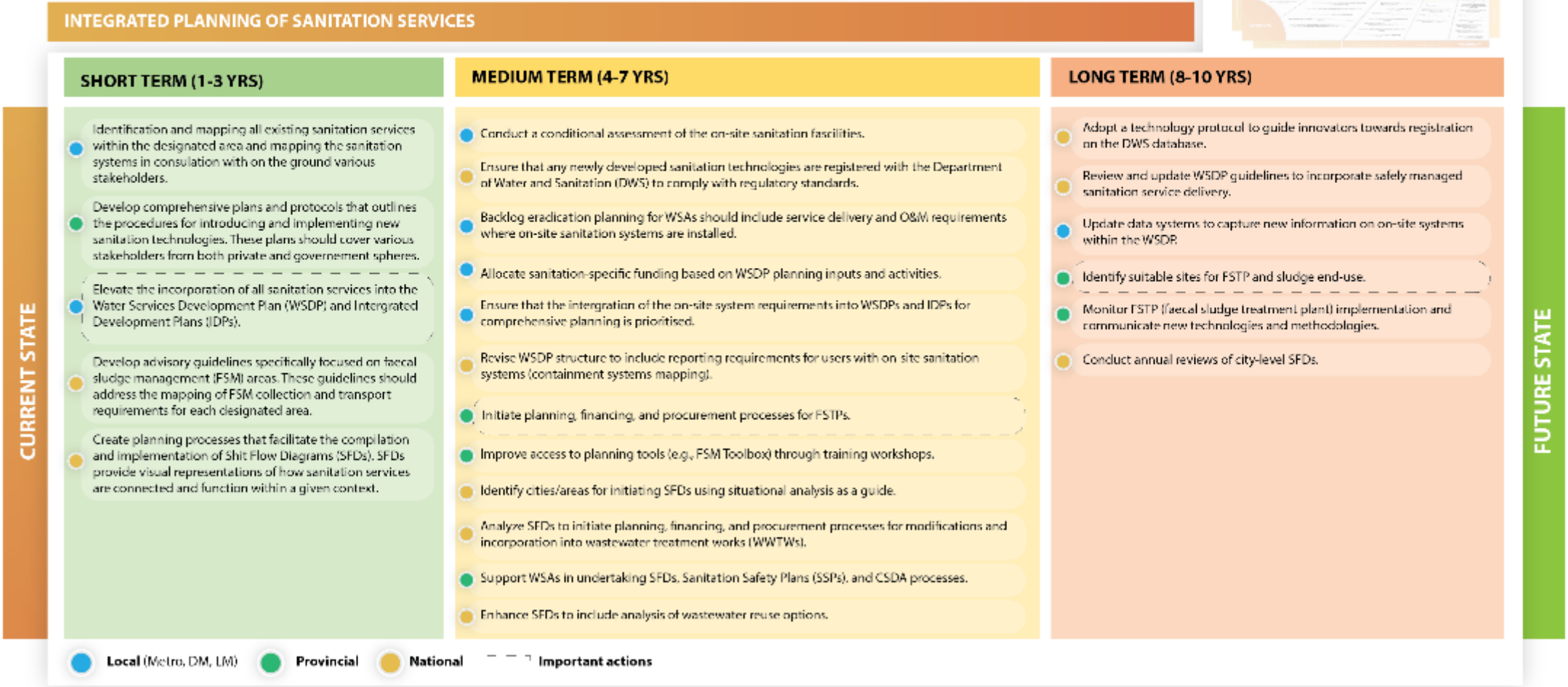
- Elevate the incorporation of all sanitation services into the WSDP and IDPs.

Medium term

- Initiate planning, financing, and procurement processes for FSTPs.

Long term

- Identify suitable sites for FSTP and sludge end-use.



14.5 Pillar 2: Institutional arrangements for sanitation services

The emphasis of the actions for this pillar is on strengthening and improving institutional arrangements for ensuring access; planning and regulating the provision of sanitation are addressed by the responsible entities. Top priority actions are as follows:

Short term

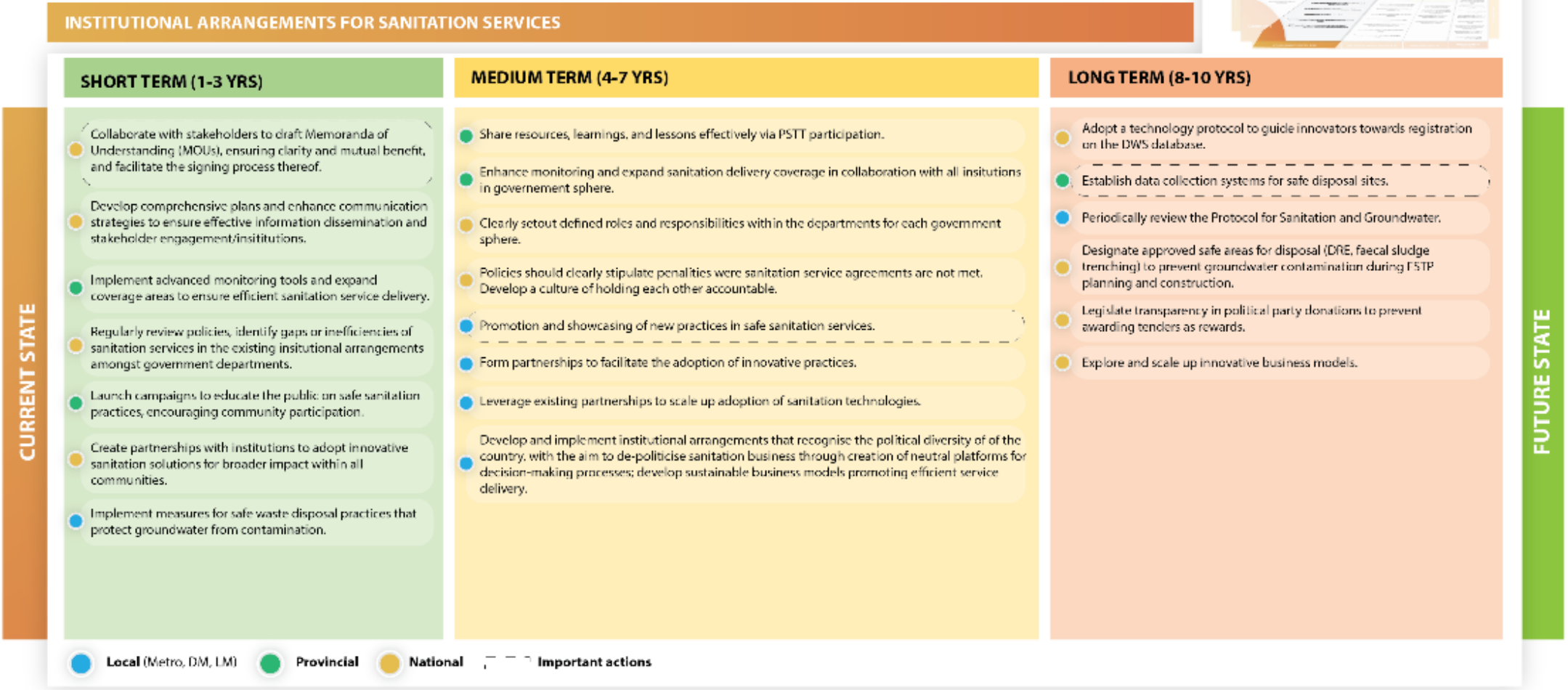
- Collaborate with stakeholders to draft memoranda of understanding and facilitate the signing process thereof.

Medium term

- Promote and showcase new practices in safe sanitation services.

Long term

- Establish data collection systems for safe disposal sites.



14.6 Pillar 3: Sustainable sanitation services

This pillar's actions' emphasis is on various sanitation systems for different settlement types. The binary engineering sanitation paradigm, providing full flush toilets in urban areas and dry sanitation in rural areas, presents challenges in infrastructure asset management that result in unsustainable sanitation and sanitation services. Top priority actions are as follows:

Short term

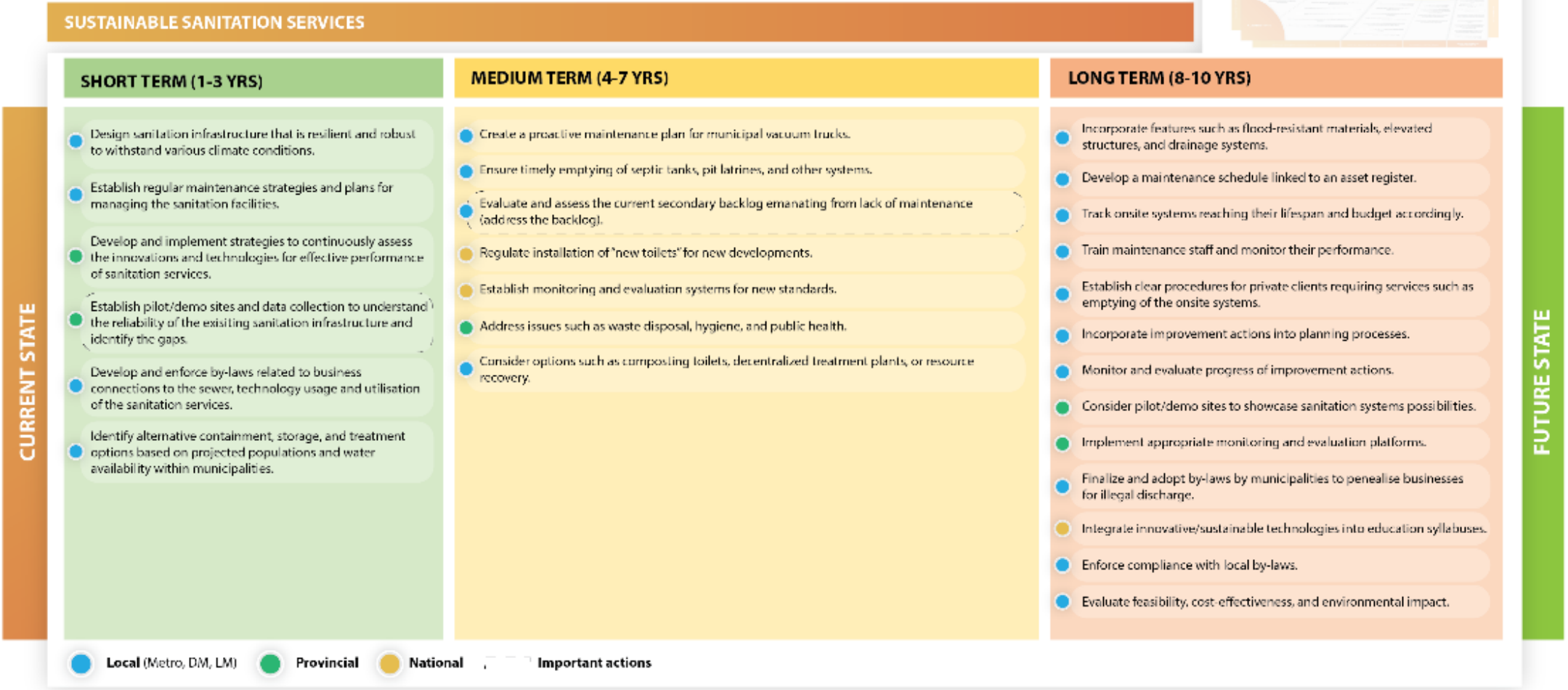
- Establish pilot/demo sites and data collection to understand the reliability of the existing sanitation infrastructure and identify the gaps.

Medium term

- Evaluate and assess the current secondary backlog emanating from lack of maintenance (address the backlog).

Long term

- Integrate innovative/sustainable technologies into education syllabuses.



14.7 Pillar 4: Regulation of sanitation services

The emphasis of the actions for this pillar is on ensuring that the regulation of sanitation services supports transformation from its current state to a more sustainable state of provision. Top priority actions are as follows:

Short term

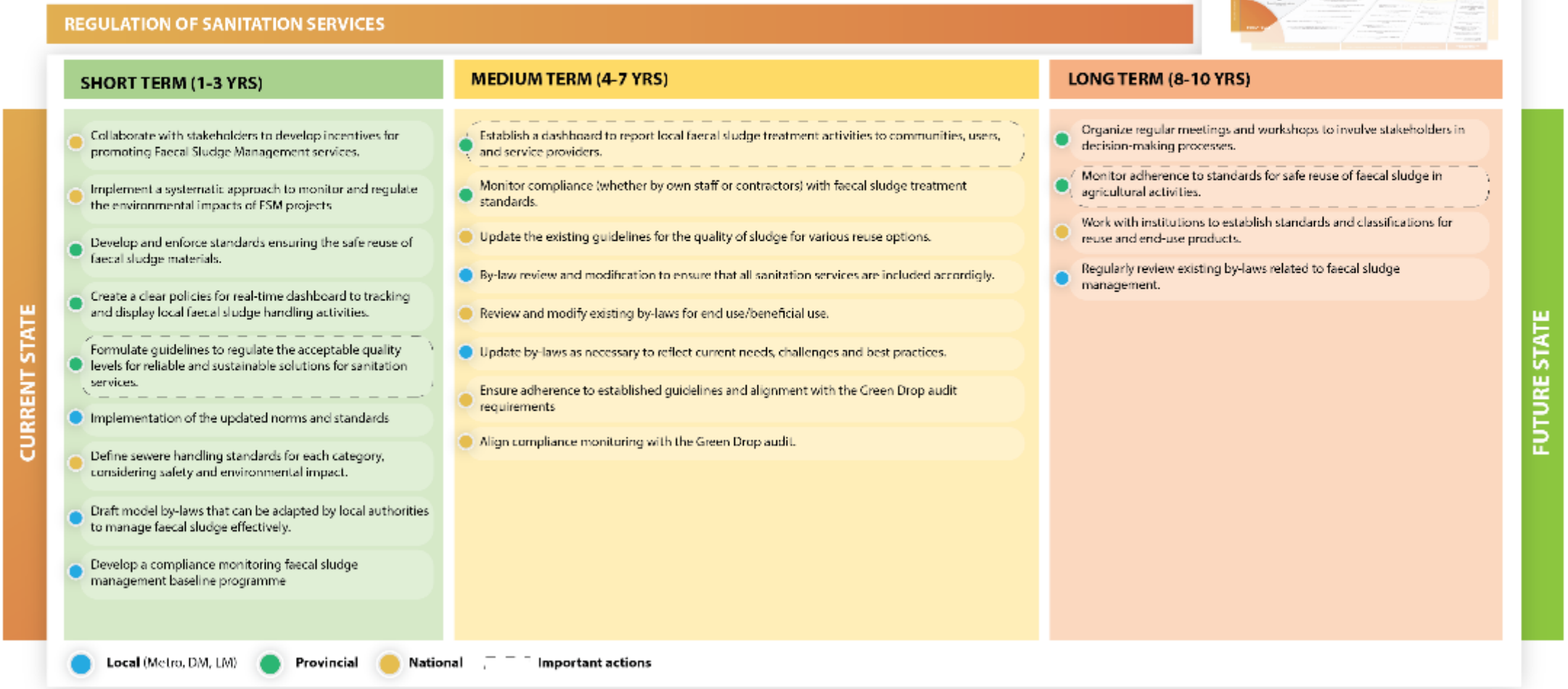
- Formulate guidelines to regulate acceptable quality levels for reliable and sustainable solutions for sanitation services.

Medium term

- Evaluate and assess the current secondary backlog emanating from lack of maintenance (address the backlog).

Long term

- Integrate innovative/sustainable technologies into education syllabuses.



14.8 Pillar 5: Participation in sanitation services

The emphasis of the actions for this pillar is on strengthening and emphasising the importance of health and hygiene through education and awareness programmes. Top priority actions are as follows:

Short term

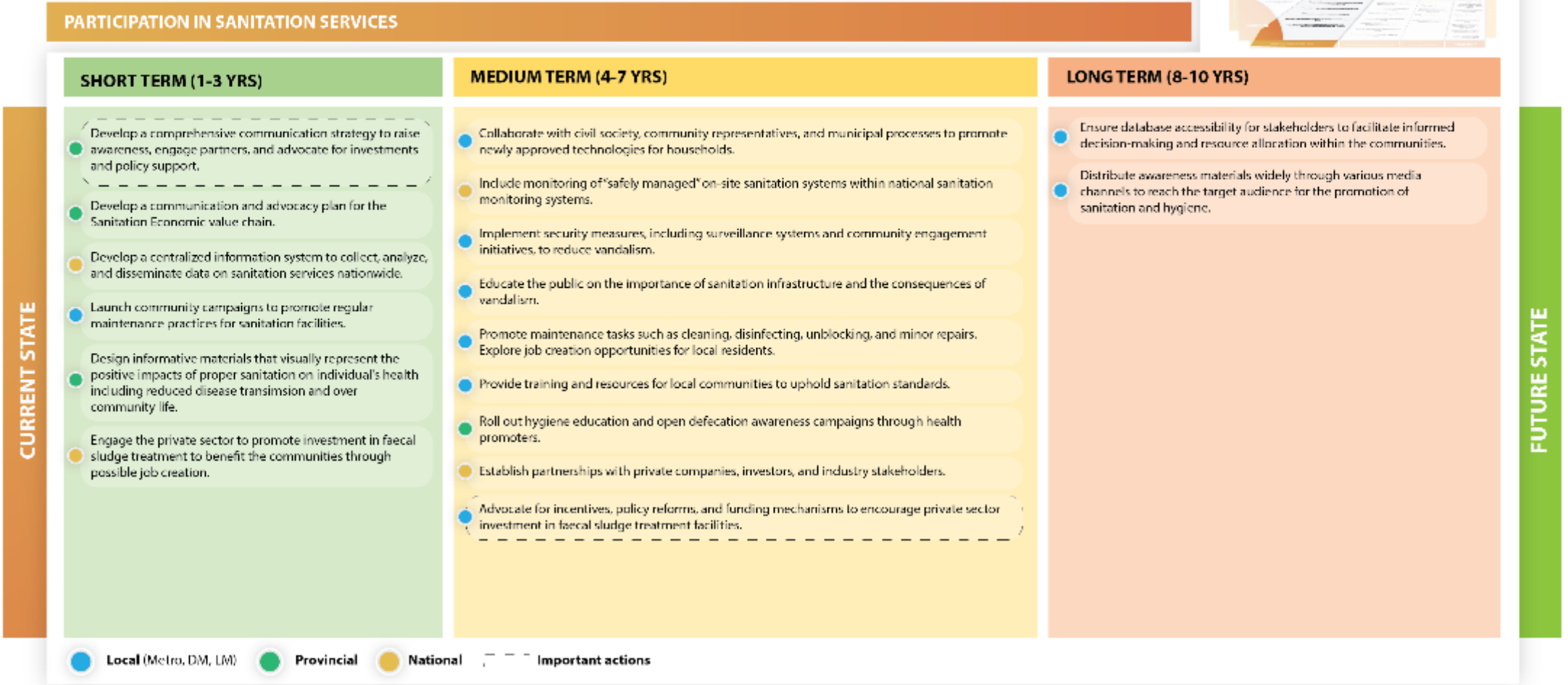
- Develop a comprehensive communication strategy to raise awareness, engage partners, and advocate for investments and policy support.

Medium term

- Advocate for incentives, policy reforms, and funding mechanisms to encourage private sector investment in FS treatment facilities.

Long term

- Distribute awareness materials widely through various media channels to reach the target audience for the promotion of sanitation and hygiene.



14.9 Pillar 6: Capacity and resource development

The actions are designed to meet the aims of the NSP (2016) through the development and implementation of capacity and training activities to close the skills and capacity gap. Top priority actions are as follows:

Short term

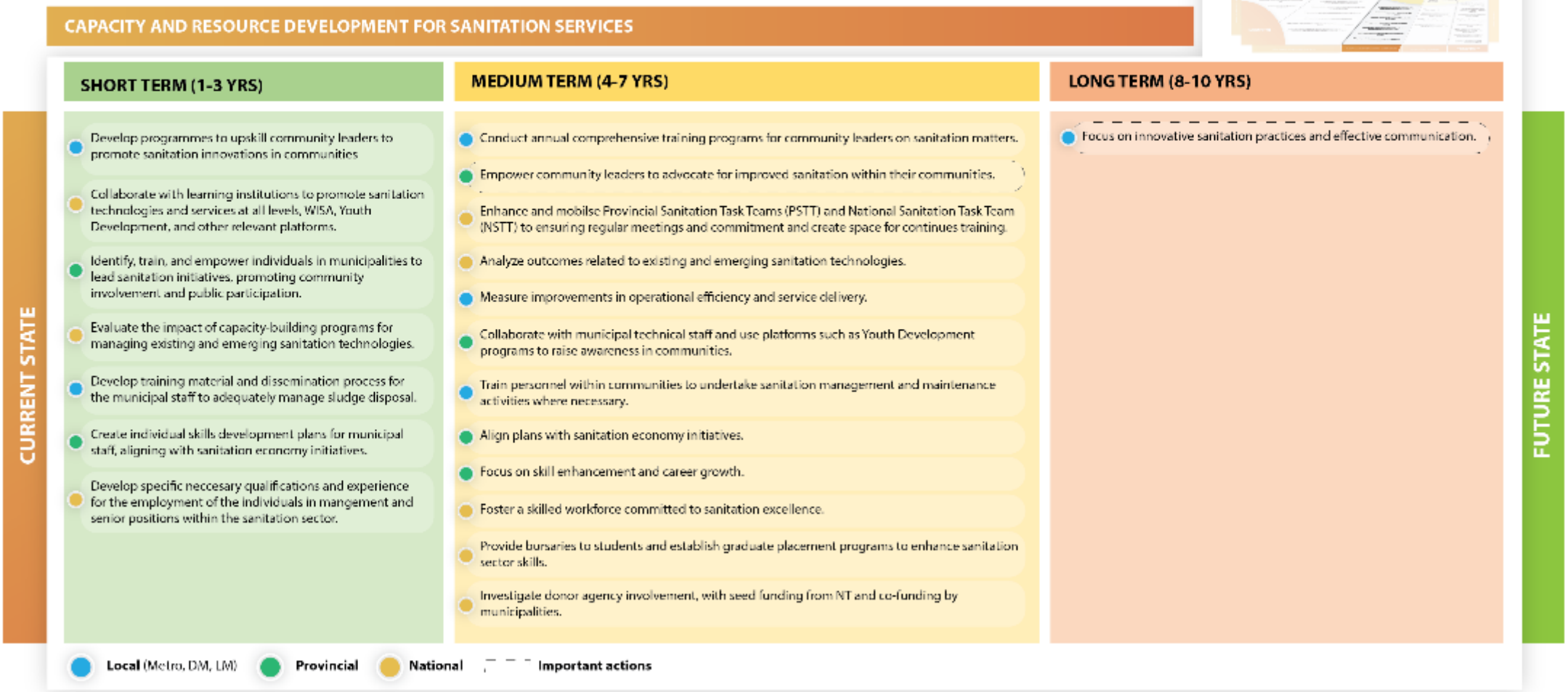
- Collaborate with learning institutions to promote sanitation technologies and services at all levels, WISA, Youth Development, and other relevant platforms.

Medium term

- Empower community leaders to advocate for improved sanitation within their communities.

Long term

- Focus on innovative sanitation practices and effective communication.



14.10 Pillar 7: Financial requirements for sanitation services

These actions are designed to address financial mechanisms/options and review financial policies to strengthen the sanitation service delivery as well as to create platforms for partnerships and collaboration with the private sector in the sanitation arena. Top priority actions are as follows:

Short term

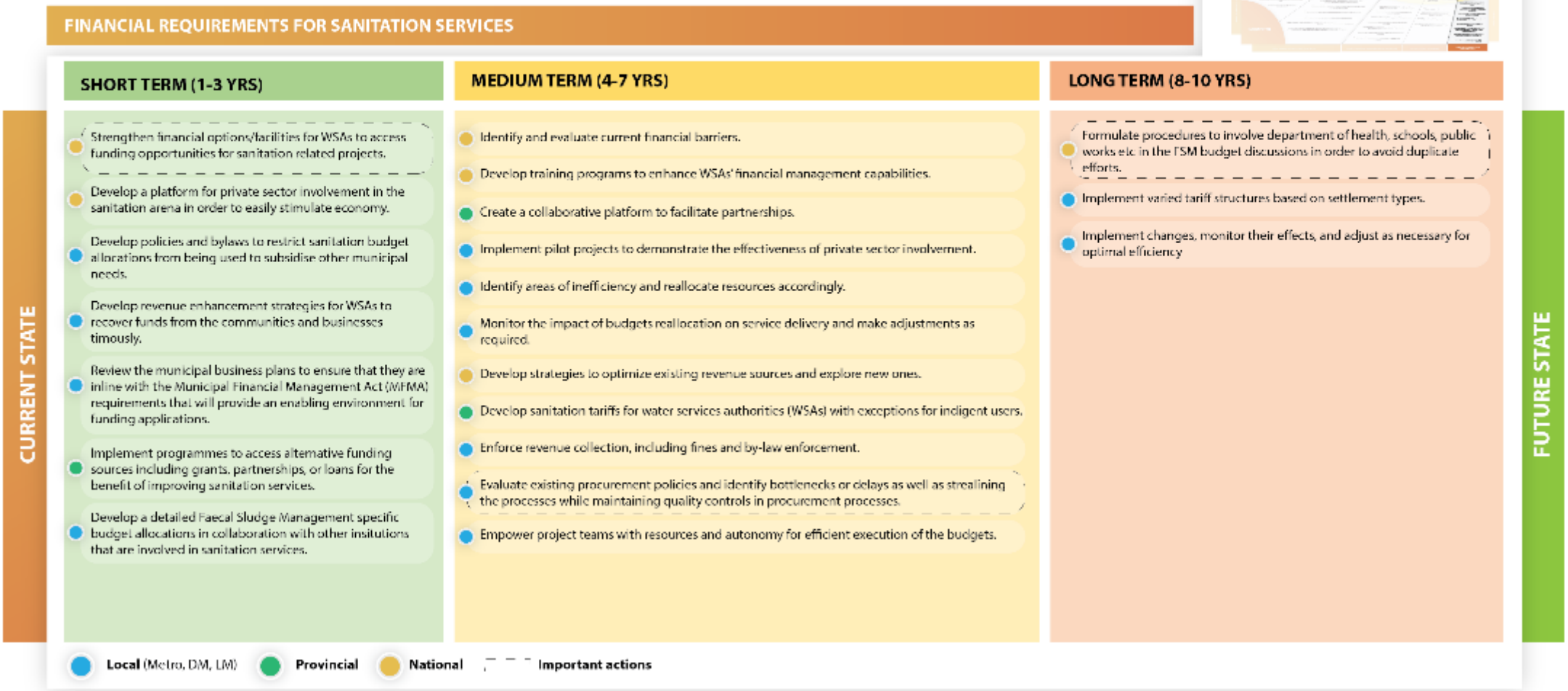
- Strengthen financial options/facilities for WSAs to access funding opportunities for sanitation-related projects.

Medium term

- Evaluate existing procurement policies, identify bottlenecks or delays, streamline the processes, and maintain quality controls in procurement processes.

Long term

- Formulate procedures to involve DoH, schools, public works etc. in the FSM budget discussions in order to prevent the duplication of effort.



15 Funding considerations

Where will the money come from?

15.1 Financial and funding considerations

The complexity of implementing sanitation solutions: beyond simple implementation

There are technologies available to help solve sanitation challenges, but it is not always easy to implement them. What needs to change?

To achieve the SDG 6 targets, there is a need to increase investment in financing sanitation services. Existing funding under government schemes is unlikely to meet investment requirements to achieve universal sanitation. Additionally, financing is needed to support the implementation of innovations from research and development, capacity-building, and programmes to promote user education and awareness.

The large public financing gap and the lack of capacity are evidence that the government needs assistance in addressing difficulties related to the provision, development and maintenance of water infrastructure in South Africa. An estimated R33 billion per annum is required to close the water and sanitation infrastructure funding gap in South Africa over the next 10 years (DWS, 2018).

A possible alternative to chemical toilets?

Sanitation systems are both a social and a technical system, and their success depends as much on ongoing management, maintenance and governance arrangements as it does on the installation of toilets and pipes.

Simplified sewerage systems (SSSs) have been recognised as an affordable way to provide good quality urban sanitation (Yap et al., 2023). These systems use smaller diameter pipes and are laid at a shallower depth and flatter gradient than conventional sewers, which means lower costs and a more flexible design. Importantly, household toilets are usually part of the installation. SSSs have been successfully implemented in Brazil and Pakistan, with significant impacts on the health outcomes of connected households, as well as lower costs. There are challenges (e.g. pipes become blocked if insufficient water is used, so topography must be considered) and ownership by and close cooperation with the community are essential.

Are limited funds being used effectively? How do the costs of chemical toilets compare to those of a sewered system?

A simple calculation (ignoring inflation) was performed to check when the cumulative costs of renting a chemical toilet become greater than the cumulative costs of installing and maintaining a sewer system. The graph below indicates this period to be between 10 and 11 years.

Anecdotal accounts by the Department of Human Settlements indicates that it currently takes between 5 and 7 years for an informal settlement to be upgraded. The graph shows that after 7 years, approximately 75% of the cumulative costs of installing and maintaining a sewer system could already have been spent on renting chemical toilets.

Something needs to be done to speed up the process of formalising informal settlements and/or introduce alternatives to chemical toilets that are more cost-effective.

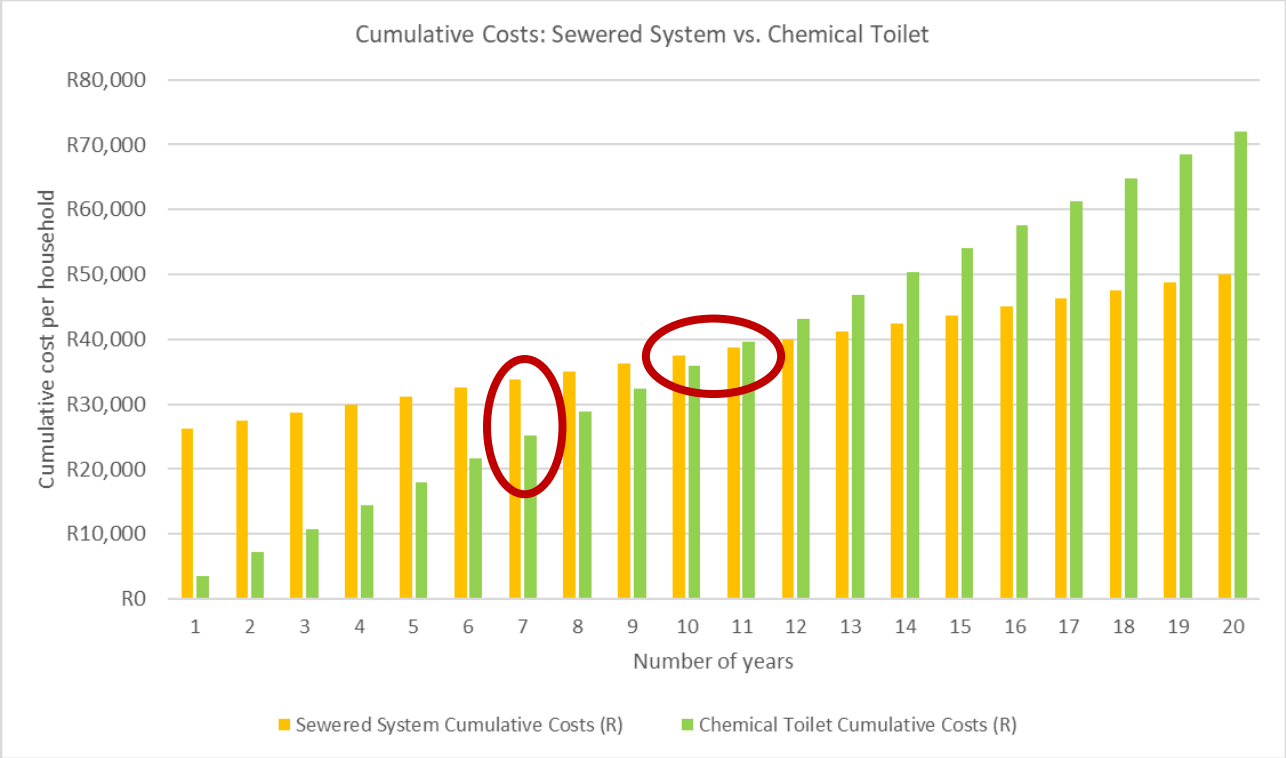


FIGURE 15-1: CUMULATIVE COST COMPARISON OF A SEWERED SYSTEM AND A CHEMICAL TOILET OVER 20 YEARS

15.2 Alternative approaches to financing sanitation initiatives

The public funding gap is growing, a rapid turnaround in sanitation services is needed. What can be done?

Innovative financing is vital to support the government's dwindling resources.

As the public funding gap in South Africa is likely to grow, innovative deal structures and government support will become even more important. New delivery models are required to close the funding gap and alleviate the increasing demands on sanitation infrastructure. It is essential to explore innovative approaches to financing sanitation initiatives, such as the examples noted below.

Public–private partnerships, or PPPs, are sometimes used in developing countries to, amongst other things, combat inefficient and expensive infrastructure development and maintenance. To date, few municipalities have contracted out services because of the complex process and the legislated consultation requirements. Both DWS and National Treasury recognise the value of supporting the contracting out of services. DWS is in the process of establishing a national centre of excellence to champion and support PPPs and other forms of contracting in the water sector. They have entered into an agreement with the Development Bank of Southern Africa (DBSA) to establish the Water Partnership Office (WPO). A key objective of the WPO is to support effective long-term contracting with the private sector, with a view to harnessing private-sector skills and commercial and blended finance to improve water and sanitation services outcomes.

Crowdfunding is a vehicle to source funds from individuals or organisations to fund different causes ranging from business ideas to charity initiatives. Crowdfunding campaigns have the potential to be a powerful marketing tool and can be used to test products, market uptake and customer engagement. Often sanitation entrepreneurs are not funded by traditional banks, and alternative funding options, like crowdfunding, help them raise capital.

Although crowdfunding is not yet mainstream in South Africa, the impacts of COVID-19 resulted in a significant increase in interest in it. Crowdfunding is legal in South Africa, but there are no laws to regulate crowdfunding, and each crowdfunding platform currently sets its own requirements. Types include (SMESA, 2022):

- Donation-based (e.g. raising funds for charities or a personal cause)
- Reward-based (offered a reward/incentive to contribute; no transfer of ownership)
- Investment-based (equity – percentage ownership in the company; lending – fixed rate of interest; royalty – percentage of revenue)
- Hybrid approaches – where two or more of the above are combined

There are three broad categories of funders: individuals, businesses, and institutions.

Crowdfunding normally follows a five-step process:

1 Design campaign
2 Identify funders
3 Identify partners
4 Design and roll out campaign
5 Implement on-the-ground activities

Potential sanitation projects for crowdfunding campaigns include:

- Building toilets for households
- Building toilets at schools
- Constructing treatment facilities to treat household waste

Some private enterprises are investing in schools' sanitation - an investment in the customers of tomorrow.

What opportunities are out there and how can we nurture them and help them grow?

Impact investments are made with the intention to generate positive, measurable social and environmental impact alongside a financial return (GIIN, 2023). Impact investors seek not only financial returns but also a measurable, positive social and environmental impact. Typical barriers to successful impact investments include lack of lifecycle support, the possibility of political interference, and low financial return expectations. Experience has shown that government subsidisation in rural areas should be considered to decrease the complexity of deal structuring in impact investing in infrastructure and the low financial return expectations. Such subsidisation could counter the low water tariff recovery rates, paving the way for more investment opportunities. Government could also ensure agreements with small and medium-sized social enterprises for the future selling or purchasing of resources that could mitigate some of the financial risks that private-sector investors face.

15.3 Water Partnership Office

Increasing private-sector participation in municipal water services

Municipalities are constrained in terms of finance and expertise to address many of the challenges they face. Private-sector involvement in municipal water and sanitation services is very low in South Africa. How can this be changed?

Banks and pension funds are eager to increase the proportion of their portfolios invested in public infrastructure, specifically water and sanitation infrastructure. Private-sector investment in public infrastructure is feasible where a sustainable revenue stream is associated with the investment, so that the private sector can get a reasonable return on its investment (i.e. the project must be bankable). It is therefore necessary to bring to the market properly packaged projects that adequately consider aspects such as risk allocation, financing model, and clearly defined scopes of work and performance measurements, payment models and contractual arrangements.

In partnership with SALGA and DBSA, DWS has established the National Water Partnerships Programme and Water Partnership Office (WPO) in the DBSA. Roles of the WPO are (WPO, 2023):

- To develop standardised national programmes for private-sector participation in municipal water and sanitation services to make it easier, quicker and cheaper for municipalities and water boards to enter into partnerships without having to reinvent the wheel for each partnership
- To support municipalities and water boards to participate in the programmes – where municipalities lack the required expertise to undertake feasibility studies and financial structuring
- Where appropriate, to facilitate blended financing, including participation by Development Finance Institutions Standardised programmes for partnerships include:
  - **Wastewater treatment** (help municipalities upgrade, refurbish and rehabilitate wastewater treatment facilities)
  - **Management contracts** (private-sector provides management support to W&S function in municipality, both engineering and non-engineering functions)
  - **Non-revenue water** (comprehensive water conservation, water demand management and cost recovery programme focused on reducing losses and over-consumption and improving cost recovery)
  - **Seawater desalination** (independent production of potable water through seawater desalination in coastal cities)
  - **Water reuse** (further treatment of municipal wastewater to enable it to be resold for other purposes, e.g. potable, industrial, or agricultural)
  - **NSS** (co-create and operationalise the fast-tracking and large-scale adoption of NSS solutions in South Africa)

DWS perspective on water reuse

- Water 'reuse' means using treated or untreated wastewater for a process other than the one that generated it. It involves a change in user, e.g. the reuse of municipal wastewater for agricultural irrigation (DWS, 2023c).
- Position 26 of the NSP (2016) emphasises the need to 'reduce, reuse, recycle, recover and reclaim in the sanitation sector'.
- The National Strategy for Water Reuse, the National Water Resources Strategy II and National Water and Sanitation Master Plan all support reuse.
- The reuse of effluent from WWTWs requires authorisation by DWS. The water use licensee must apply to DWS for authorisation before implementing water reuse activities in WWTWs.
- DWS may amend water use licences to include conditions for water reuse.
- Long-term partnerships with the private sector are encouraged as critical enablers of water reuse.

FIGURE 15-2: SUPPORT PROVIDED BY THE WATER PARTNERSHIP OFFICE (WPO, 2023)

16 Monitoring and evaluation framework

Section 16 provides a summary of data and findings from the **Monitoring Framework and Guide** report.

For access to the full report, scan, the QR code above.

How will we measure our success and impact?

16.1 Monitoring and evaluation

Building appropriate systems to monitor performance

Achieving sustainable sanitation throughout South Africa is impossible without robust data systems that inform decision-making. The monitoring and evaluation (M&E) tool helps identify issues of concern for prioritised action.

Sanitation is a complex integrated system that involves various aspects and requires cooperation and coordination between many stakeholders. To effectively plan, implement, monitor and manage such a system requires reliable and comprehensive data. The NSIP situation analysis has revealed, however, that sanitation data is often incomplete and inaccurate, and that data collection and management for NSS is significantly worse than for sewered sanitation. This hinders evidence-based decision-making and appropriate resource allocation. Furthermore, appropriate sanitation data governance requires collaboration, coordination and standardisation among various stakeholders and institutions working in the sector.

To bridge current data gaps in the sanitation sector, DWS is developing an appropriate **support and monitoring framework** and accompanying **sanitation monitoring and evaluation tool** to help identify performance gaps and drive progressive improvement.

The tool will also be used to monitor sector progress and the implementation of the foundational actions and key actions identified through the NSIP process.

As part of the process, it is crucial to address data systems at the local service level, ensuring their integration with regulatory and national frameworks. The processes will help support the integrity and reliability of national sanitation datasets and enable effective decision-making. This will also support more accurate reporting to required global monitoring processes and systems.

The M&E framework will support:

- Data-based decision-making
- Resource planning and management
- Policy formulation and implementation
- Progress tracking and reporting
- Foster transparency and accountability
- Foster participation of different actors and beneficiaries
- Contribute to monitoring achievement of the SDGs and other national and international commitments

Photo: technofaq.org

16.2 Monitoring and evaluation tool

How will DWS ensure that the NSIP works?

DWS will use the monitoring and evaluation (M&E) tool to track both sanitation sector performance and NSIP action implementation.

As part of the NSIP, a spreadsheet-based tool has been developed to help monitor and track:

- Sanitation performance at a WSA and provincial level
  - This component considers sanitation management principles and baseline data gathered through the NSIP situational assessment process. Performance assessment criteria can be reviewed and amended as improvements in M&E are noted through the sector. Refer to Appendix B of the Monitoring Framework and Guide for the defined scoring criteria.
- Implementation of NSIP actions
  - This component considers the 'foundational actions' and 'key actions' arising from the NSIP. Without adequate implementation of these actions, the sanitation performance is unlikely to change.

The tool supports status reporting with a database that can be updated with inputs from key stakeholders, including municipalities and other sector departments. The tool also assists in action and improvement planning and is supported by a list of possible actions for consideration. The tool will help:

- Municipalities prioritise key actions and tasks and will allow for the allocation of roles and responsibilities, timelines for task completion and associated budgeting of the planned tasks
- Sector stakeholders monitor the status of required foundational actions and key actions

The tool will function as a monitoring tool that tracks the implementation of required tasks and progress towards developed targets. The tool measures progress in the implementation of sanitation initiatives and can be used to provide a regular update to the sanitation situational analysis.

In the future, the M&E tool will be web-enabled, thus providing the broader sanitation sector with easy access to data.

As part of this process, it will be important to improve and strengthen data governance, institutions, and staff involved in collecting data for this tool. This will require appropriate capacity development and system training.

Improving sanitation data can strengthen global systems and enable the national reporting and benchmarking of progress towards SDGs and other international targets.

Photo: Henry & Co. on Unsplash

17 Conclusion

Let’s all work together and get it done.

All South Africans need to recognise the urgency of the current situation. The sanitation sector needs a shared vision that enables a successful transition to sustainable sanitation management. To make this a reality, everyone needs to work together – individuals, government, businesses, and industry – and embrace the required sector changes. The sanitation challenges everyone faces are not an excuse for inaction. Although there is still much work to be done, there is existing experience and momentum to build on. The success of the NSIP lies in having a coherent and sustained approach, and in creating an enabling and empowering environment that supports the necessary change at scale. This is an ideal opportunity for everyone to mobilise actions to drive the required changes to the South African sanitation sector.

Additional reading

A growing library of national and international sanitation literature is available

Guidelines, tools and case studies of good practice are available through various local and international websites.

- Some material presented in this document is derived from other NSIP outputs (available on request)
  - Provincial situational assessments
  - Provincial action plans
  - Sanitation delivery model
  - Addressing open defecation in cities
  - Improving implementation of sanitation innovations
  - Regulatory indicators for NSS services
  - Unlocking economic opportunities in the sanitation service chain
- International guidance
  - WHO sanitation (https://www.who.int)
  - IWA FSM Handbook (Systems Approach for Implementation and Operation) (https://www.iwapublishing.com/books)
  - EAWAG Compendium of Sanitation Systems and Technologies (https://www.eawag.ch)
  - SFDs (https://sfd.susana.org/)
  - FSM Toolbox (https://www.fsmtoolbox.com/)
  - Toilet Board Coalition (https://www.toiletboard.org/)
- Local guidance
  - The WRC has a sizeable repository related to sanitation, including SaniSelect, W_2RAP, wastewater treatment plant assessment, and school sanitation. Knowledge materials can easily be accessed at www.wrc.org.za

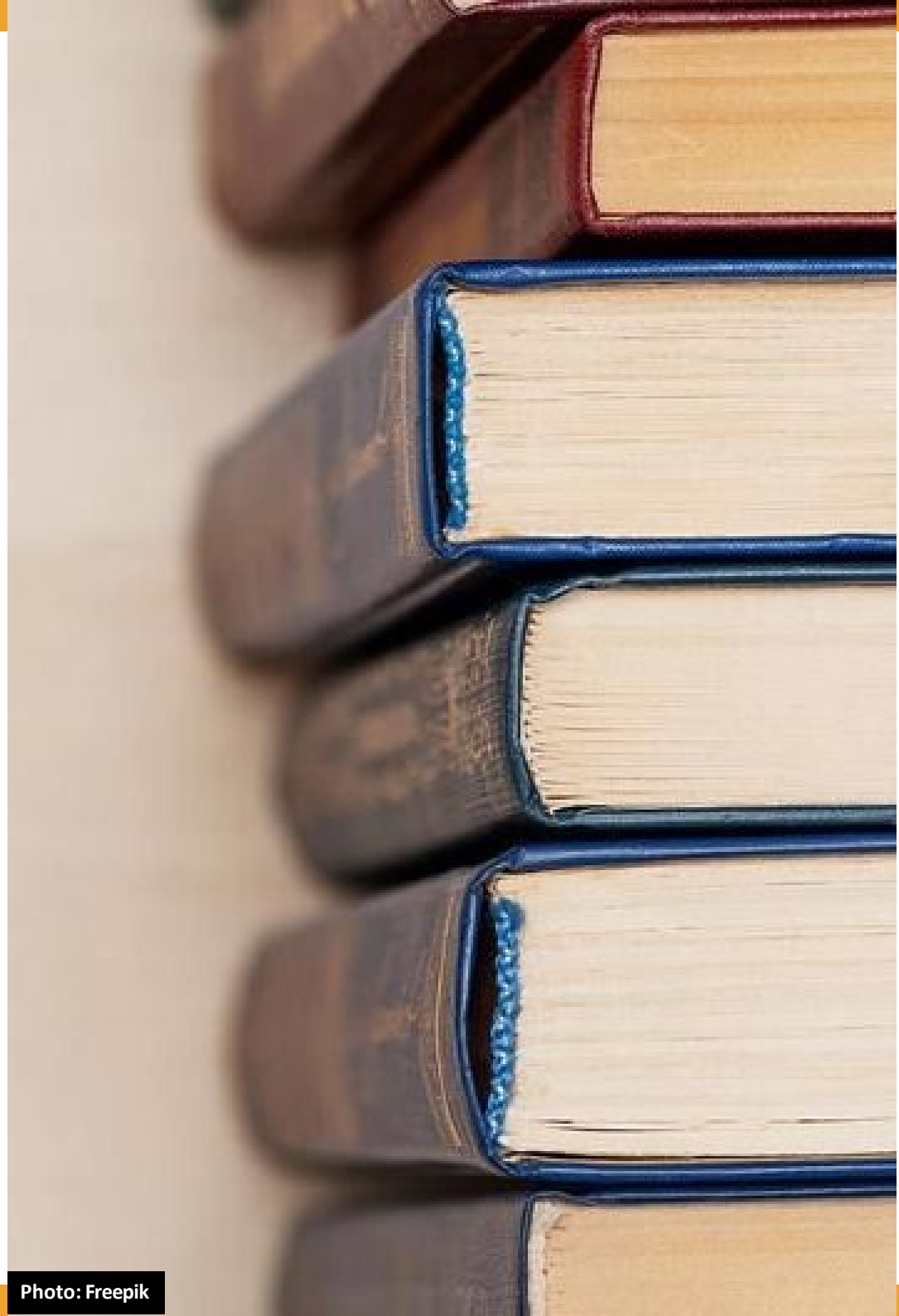


Photo: Freepik

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Notes

Annexures

A1: NSIP purpose and methodology

Why and how was the NSIP developed?

Photos: Philip de Souza

The main goal of the NSIP is to assist the sanitation sector in providing adequate and innovative sanitation services and solutions to enable long-term sustainable management of sanitation services in South Africa. The NSIP will help prioritise sanitation provision aligned to commitments of the National Development Plan (NDP) 2030, National Water and Sanitation Master Plan (NWSMP), and Sustainable Development Goals (SDGs).

The NSIP was developed over a 3-year period with comprehensive stakeholder engagement to ensure an appropriate and accurate plan.

During that period, the following key tasks were performed:

- Stakeholder identification and consultation
- Situation analysis (refer to Section 3)
- Action plan development (refer to Section 6)
- Monitoring framework (refer to Section 8)

In addition, the following pressing sanitation sector questions were addressed (refer to Section 5):

- What options are available to address open defecation in cities?
- Does DWS need to consider a new sanitation delivery model per settlement type?
- What regulatory framework is appropriate for non-sewered sanitation services?
- How does DWS ensure adequate uptake of appropriate sanitation technologies?
- How does DWS stimulate sanitation economic opportunities?

In the development of the NSIP, skills transfer to, and capacity development of, key officials and stakeholders were achieved.

As a result, the NSIP provides a 10-year roadmap for eradicating open defecation, ensuring access to adequate sanitation services per province, providing innovative solutions, and creating a pathway to generate economic opportunities.

Implementing the NSIP actions will lower disease burden, improve citizens' quality of life and dignity, provide a healthier living environment for future generations, and provide many other socio-economic opportunities.

A2: Stakeholder engagements

The NSIP in numbers

Stakeholder engagements are critical in understanding different needs and perspectives and obtaining NSIP agreement and buy-in. Stakeholder engagements are also an ideal opportunity to share knowledge.

- Almost 40 stakeholder consultation sessions held nationally
- Engagements with more than 1,000 stakeholders, including representatives from:
  - Water services authorities (municipalities)
  - Department of Water and Sanitation (DWS) national and regional offices
  - Department of Cooperative Governance and Traditional Affairs (CoGTA)
  - Municipal Infrastructure Support Agency (MISA)
  - Department of Basic Education (DBE)
  - Department of Forestry, Fisheries and the Environment (DFFE)
  - Department of Health (DoH)
  - Department of Human Settlements (DHS)
  - Department of Public Works and Infrastructure (DPWI)
  - Private sector
  - Civil society
- Three training sessions, including site visits

A3: Sanitation action plan framework

Putting the National Sanitation Policy into action

Owing to the National Sanitation Policy (NSP) (2016), which provides policy positions to address identified sanitation policy gaps and challenges and aims to address the country's national and international development imperatives, goals and strategic objectives identified in the NSIP align to NSP principles and requirements.

Sanitation service provision in South Africa is based on the following principles:

- The right to access to basic sanitation
- Prioritising hygiene and end-user education in sanitation service provision
- Prioritising basic sanitation services to vulnerable people and unserved households
- People-centred and demand-driven sanitation service provision
- Polluter pays principle
- User pays principle
- Sanitation has economic value
- Integrated development
- Equitable regional allocation of development resources
- Prioritising operation and maintenance
- Integrated waste management

NSP 7 pillars of sanitation services

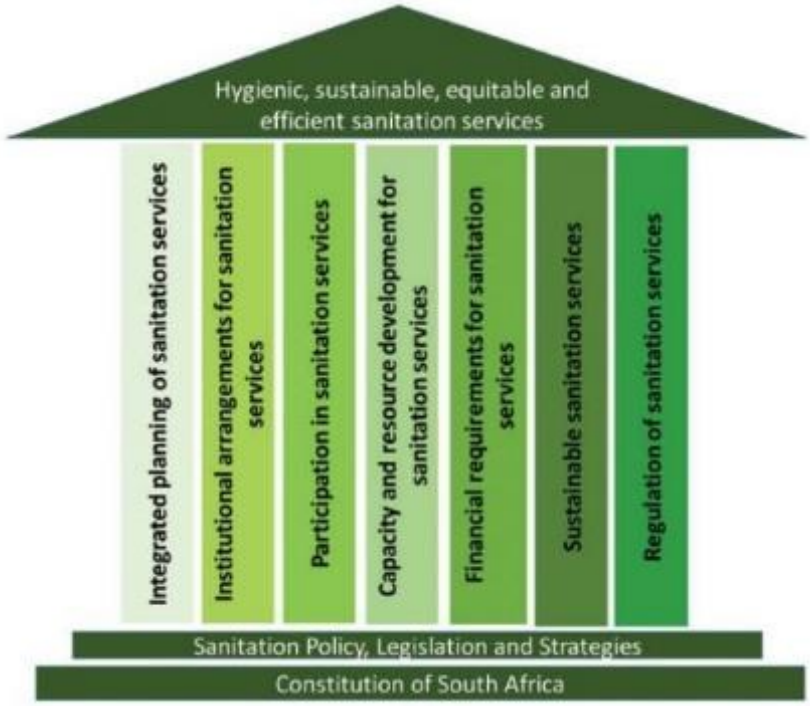
1. Integrated planning
2. Institutional arrangements
3. Participation
4. Capacity and resource development
5. Financial requirements
6. Sustainability
7. Regulation of sanitation services

What needs to be prioritised?

- Governance and legislation
- Financing
- Capacity development
- Innovation
- Data and information
- Awareness and behaviour change

What will drive the required changes?

- Appropriate solutions
- Skills development
- Funding
- Research and innovation
- Regulation and policy enablers
- Climate change



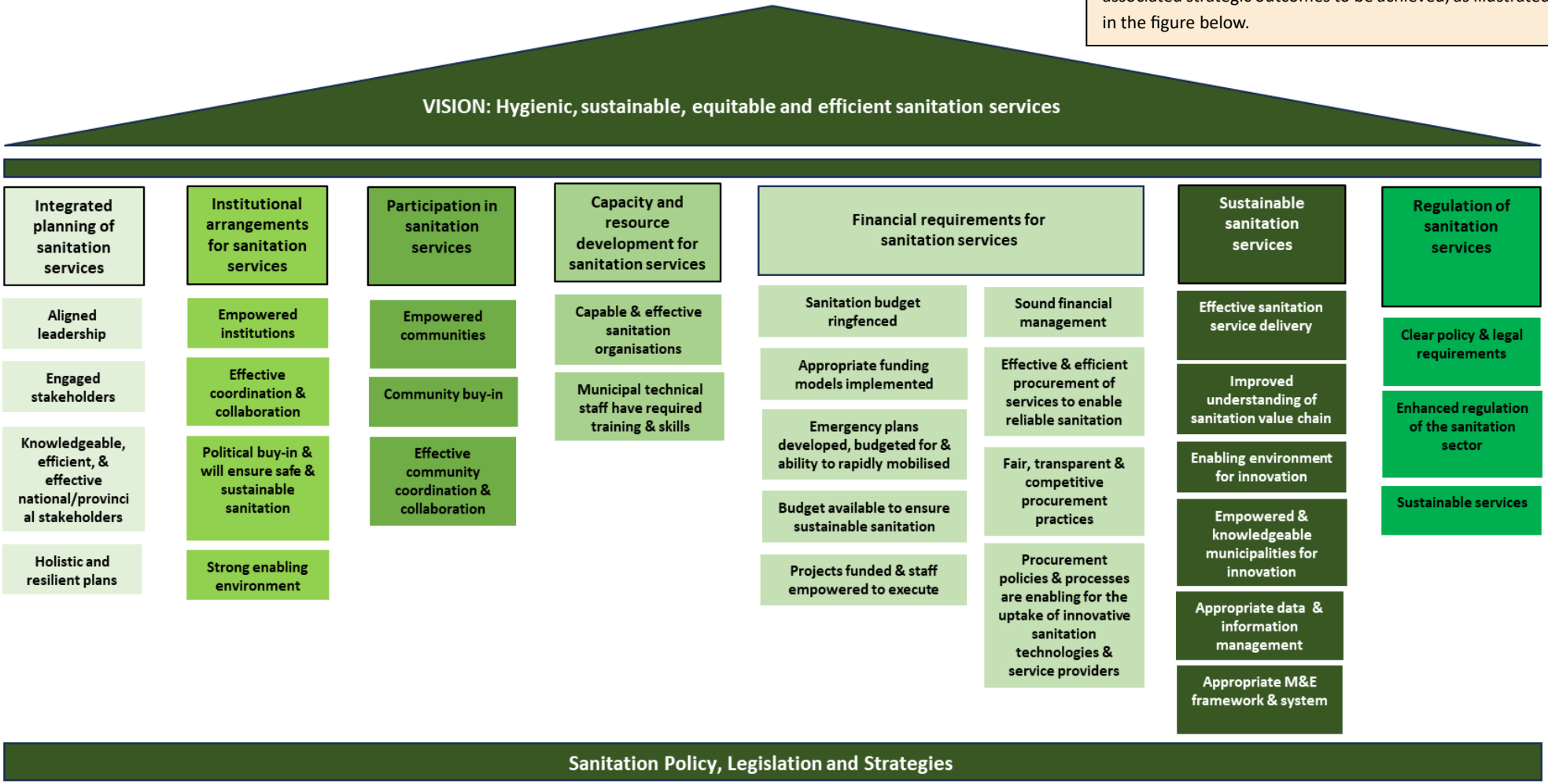
A4: Key goals of the NSIP

What high-level goals is DWS aiming to achieve?

Engagements with key stakeholders have assisted in identifying the root causes of key sanitation challenges. Further engagements were useful in developing strategic objectives that, if achieved, should lead to improved sanitation in South Africa.

The NSIP is informed by the National Sanitation Policy (NSP) (2016) vision of 'hygienic, sustainable, equitable and efficient sanitation services'.

To achieve the vision, the NSIP considers the seven pillars of the sanitation policy as the seven keys goals and the associated strategic outcomes to be achieved, as illustrated in the figure below.



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