

NATIONAL FAECAL SLUDGE MANAGEMENT STRATEGY 2023



WATER IS LIFE - SANITATION IS DIGNITY

SOUTH AFRICA IS A WATER SCARCE COUNTRY



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA





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PREAMBLE

South Africa has progressed to address universal access to sanitation since the approval of the White Paper on Water Supply and Sanitation Policy (1994) which focused on the provision of a basic level of water supply and sanitation services. The National Sanitation Policy (2016) has presented a paradigm shift from the provision of universal access to sanitation to advancing policy positions advocating for the entire sanitation service chain and include the safe management of human excreta from capture, containment, emptying, transportation, treatment, safe disposal and or beneficial use.

The National Faecal Sludge Management Strategy for On-site Sanitation is giving effect to the implementation of the National Sanitation Policy (2016), the National Development Plan (NDP) and the Sustainable Development Goals (SDGs).

The National Faecal Sludge Management Strategy guides the sector on the safe management of faecal sludge to enhance operations and maintenance of on-site sanitation systems, to prevent groundwater contamination, safeguard public health and protects the environment from pollution throughout the sanitation service chain.

The implementation of the sanitation service chain is complex and involves a number of stakeholders and institutions. The National Faecal Sludge Management Strategy will establish the sustainable management and regulatory frameworks for faecal sludge management in South Africa.

The strategy acknowledges the economic value of sanitation by promoting the beneficial use of faecal sludge as a resource with secondary spin-offs in the form of creating jobs and economic opportunities.

FOREWORD

MINISTER OF WATER AND SANITATION

Access to safe and hygienic sanitation is a human right as enshrined in the Constitution of the Republic of South Africa and contributes to improved public health, dignity, and a clean environment (Section 24) of the Constitution of South Africa (Act 108 of 1996). In an endeavour to execute the Constitutional mandate, 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 the Sustainable Development Goal Target 6.2 on Sanitation and Hygiene which states that “By 2030, 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 situation”.



South Africa has made significant progress in ensuring universal access to improved sanitation. Households with access to improved sanitation has increased from 61.7% in 2002 to 84.1% in 2021. There is an urgent need to focus on sustaining the sanitation infrastructure that has been provided since the dawn of our democracy so as to prolong its lifespan so that the infrastructure remains in an operational, safe and hygienic condition whilst investing in new infrastructure to respond to rapid urbanisation.

The provision of sanitation services has to be responsive and adaptive taking into cognisance that South Africa is a water scarce country coupled with prolonged droughts in recent years which limit water availability in certain locations and is a real challenge to meet all water demands. Sanitation services in South Africa varies from off-site to on-site sanitation systems depending on settlement conditions. While we acknowledge that currently the predominant form of sanitation in South Africa is a waterborne system (61%) which has clear management and regulatory processes in place to ensure the discharge of effluent into the water sources meet the required standards, we must now pay more attention to the management processes of on-site sanitation

The national and international commitments as alluded to earlier have been the drivers of safely managed sanitation which triggered the development of the National Faecal Sludge Management Strategy (FSM) which its primary focus is to improve the management of on-site sanitation systems. We need to acknowledge that sanitation services are not only about infrastructure but also the integration of institutional, governance and financial management systems to sustain the service.

The National FSM strategy introduces a paradigm shift of safely managing sanitation along the sanitation service chain so as to ensure access to hygienic sanitation. Our goal is to mainstream faecal sludge management as an integral part of sustainable sanitation services that will ensure that people live in an environment that is not harmful to health or wellbeing.

Achieving the Sustainable Development Goal 6.2 will require cross-sectoral partnerships and collaboration between government, private sector, academic institutions, research institutions, civil society organisations, communities and other sector partners at all levels. The National Sanitation Framework that has been approved by Cabinet will assist Government to provide equitable and safe sanitation in all settlement types.

With only seven years left until 2030 and approximately 2.8 million households without appropriate sanitation, I implore the Water Services Authorities in collaboration with all 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’ irrespective of where communities stay.

A handwritten signature in black ink, appearing to read 'S. Mchunu', written in a cursive style.

MR SENZO MCHUNU (MP)
MINISTER OF WATER AND SANITATION

PREFACE

DEPUTY MINISTER MAHLOBO

The Sustainable Development Goal 6.2 target on Sanitation and Hygiene has significantly changed the approach of managing sanitation, from access to a household sanitation facility as previously prioritized under the Millennium Development Goals, to ensuring safe management of human excreta along the sanitation service chain.

Over the past years the operation and maintenance of on-site sanitation systems have not been given much attention when compared to off-site sanitation systems. This resulted in challenges of full pits or containments which poses risks of households reverting to using unsafe makeshift pit latrines or even practice open defaecation.

This strategy presents a paradigm shift of managing sanitation services. Of importance is the need to recover, re-use and recycle faecal sludge and wastewater sludge as guided by the National Sanitation Policy (2016). The sector has embraced the reality that sanitation has an economic value, therefore there is a need to explore approaches of creating economic and job opportunities along the sanitation service chain by transitioning from a sanitation linear to circular economy and converting faecal and wastewater sludge into various by-products to other sectors. We will therefore encourage the private sector to take advantage of the reuse and resource recovery opportunities.

It has been globally accepted that the historic approach of providing conventional sewerage and centralised wastewater treatment as the only solution for urban sanitation is no longer sustainable and realistic to achieve universal access to safely managed sanitation. Considering that South Africa is a water stressed country and has a projected 17% deficit in water availability and demand by 2030, we urgently need to embrace alternative water efficient sanitation solutions that minimises the use of water resources. We can no longer afford to flush portable water while there are still communities that do not have access to drinking water. We believe on-site sanitation systems reduce water demands and can result to water security in the country.

We envisage that the implementation of this strategy will result in local economic development and improve environmental health in communities.



M D MAHLOBO (MP)
DEPUTY MINISTER OF WATER AND SANITATION



PREFACE

DEPUTY MINISTER TSHABALALA

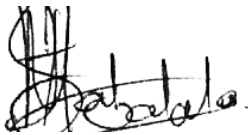
The Sustainable Development Goal 6.2 target emphasises the need to pay special attention to the needs of women and girls, and those in vulnerable situations when providing sanitation services. Women and girls are affected by poor sanitation in various ways, such as safety to use the sanitation facility, dignity, menstrual hygiene facilities and high levels of school absenteeism of girls during such cycles. Proactive maintenance, usable and hygienic sanitation facilities would go a long way in addressing the needs of women and girls.

Since faecal sludge management is a fairly new concept in South Africa, a comprehensive stakeholders' analysis was undertaken to identify all their roles on each stage of the sanitation service chain. The Strategy was subsequently developed through an intensive consultative process which ultimately stimulated cross-sector collaboration and buy-in from the onset.

Access to improved sanitation is not sufficient to ensure the safe management of human excreta from containment to disposal or reuse. We need to intensify hygiene and user education to encourage behavioural change to prevent outbreaks of diseases, eliminate disposal of solid waste and foreign objects in sanitation infrastructure and protect workers involved faecal sludge management.

This paradigm shift of managing sanitation would require a change of mind-set at all levels of decision making. We need to build capacity and raise awareness in the sector to enable successful implementation of this strategy, improve our knowledge, understanding, and skills on all processes to safely manage each stage of the sanitation service chain. Academic and training institutions would play a major role in taking us through this paradigm shift.

We trust that by developing this Strategy, we have been able to address faecal sludge management challenges that were encountered by the Water Services Authorities and various stakeholders appropriately. Our path is now to embrace it and seize the opportunity.



MS J-N TSHABALALA (MP)
DEPUTY MINISTER OF WATER AND SANITATION



PREFACE

DIRECTOR-GENERAL

After two decades of progressing in the provision of universal access to sanitation services, South Africa is advancing with sustainable faecal sludge management so as to improve functionality and reliability of on-site sanitation systems where provided. While there are still households without access to improved sanitation services, mostly in rural areas, we need to pay particular attention to the maintenance of existing sanitation infrastructure. If operations and maintenance are not prioritised, we will be going in circles as the lifespan of old and new infrastructure will be reduced.

The country is experiencing a serious challenge of full pits or containments from on-site sanitation systems, a lack of plans to provide emptying services, long travel distances to hazardous landfill sites which are also few in the country, a lack of appropriate places to dispose of faecal sludge, illegal dumping of untreated faecal sludge into the environment, and stockpiling of sludge around existing Wastewater Treatment Works. The Waste-water Treatment Works that accept faecal sludge are poorly performing as they were not designed to treat faecal sludge.

The National Faecal Sludge Management Strategy will guide the sector on the safe management of faecal sludge throughout the sanitation service chain. Our vision is to establish sustainable management and regulatory frameworks for faecal sludge management in South Africa for an improved sanitation service.

Research has proven that wastewater and faecal sludge should be treated differently due to their different characteristics. Our vision is the construction of various types of Faecal Sludge Treatment Plants that can treat faecal sludge and recover resources where viable.

Due to the water resource constraints aggravated by drought and the impact of climate change, we are working with research and relevant institutions to test emerging and innovative non-sewered sanitation systems that are off-grid and use less or no water as indicated in the National Water and Sanitation Master Plan. Fundamental to these solutions are that they provide safety and convenience to the user and prevent environmental pollution.

The Strategy distinguishes the immediate, medium, and long-term actions on each stage of the sanitation service chain in line with the six pillars of National Sanitation Policy (2016), namely: (1) Policy, Legislation and Enforcement; (2) Institutional Arrangement; (3) Planning; (4) Financing; (5) Capacity building, technical assistance and appropriate sanitation technologies; and (6) User promotion an engagement.

Various programmes will be initiated in collaboration with stakeholders to support the sector to implement the Strategy. Planning of on-site sanitation services should now focus on the sanitation services chain, rather than only on the sanitation facilities. We are also gearing up to regulate on-site sanitation systems in the entire sanitation value chain.

We are reaffirming the socio-economic value of sanitation and encourage the sector to acknowledge sanitation as a resource rather than waste. We believe this Strategy will turnaround the provision of sanitation services in South Africa and in so doing strive towards achieving the Sustainable Development Goal target for Sanitation and Hygiene.



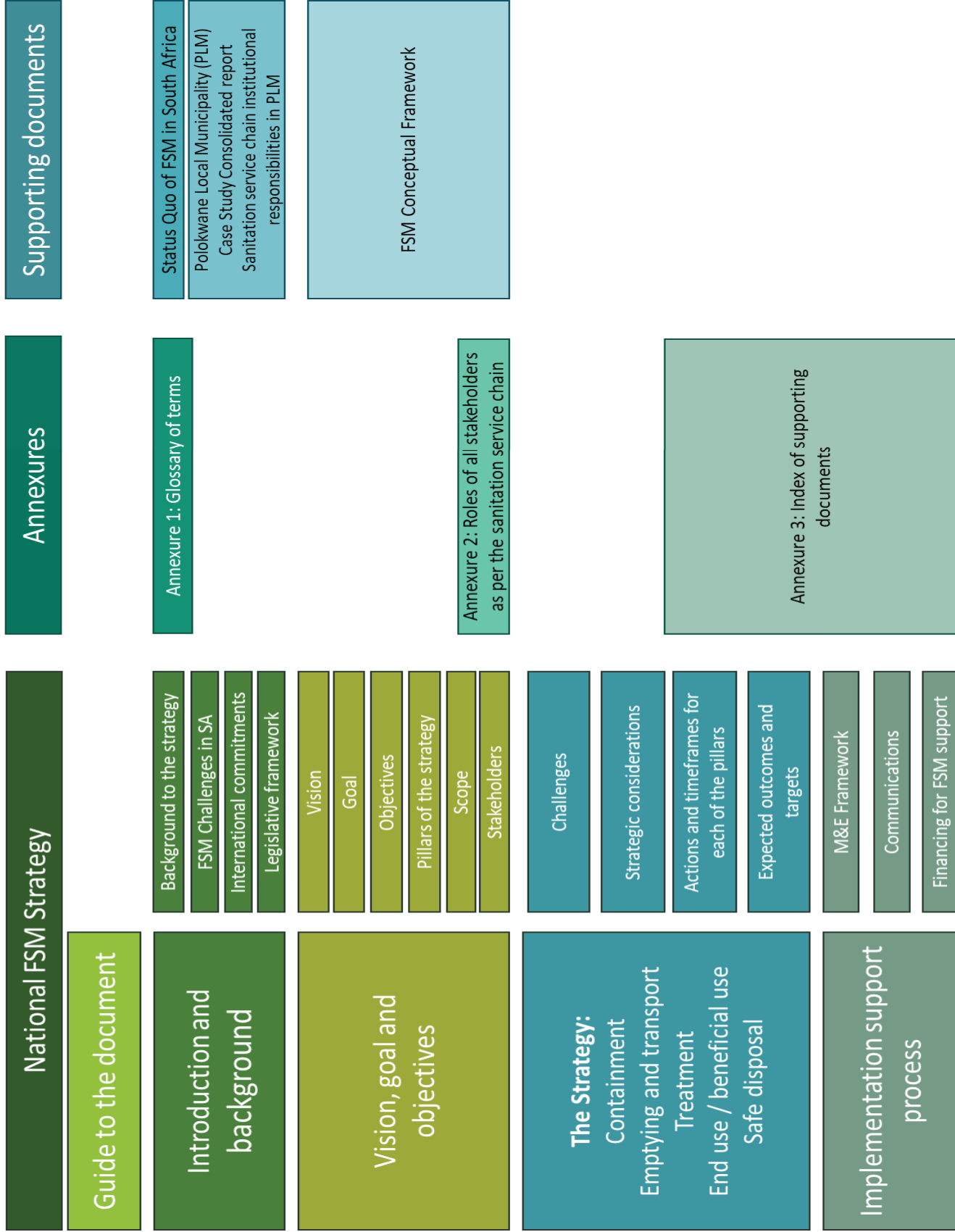
DR SD PHILLIPS
DIRECTOR-GENERAL



LIST OF ACRONYMS

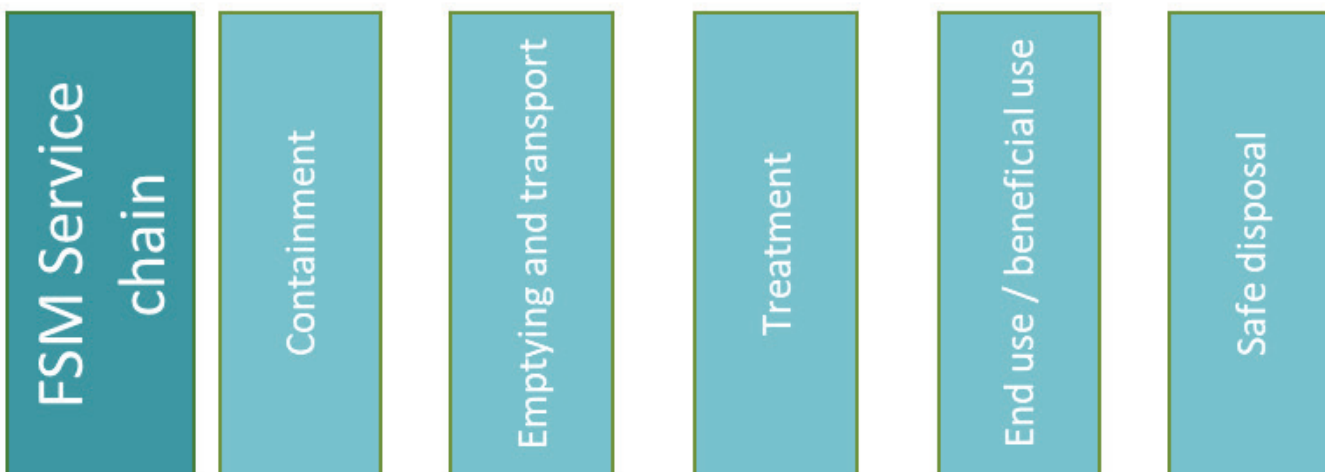
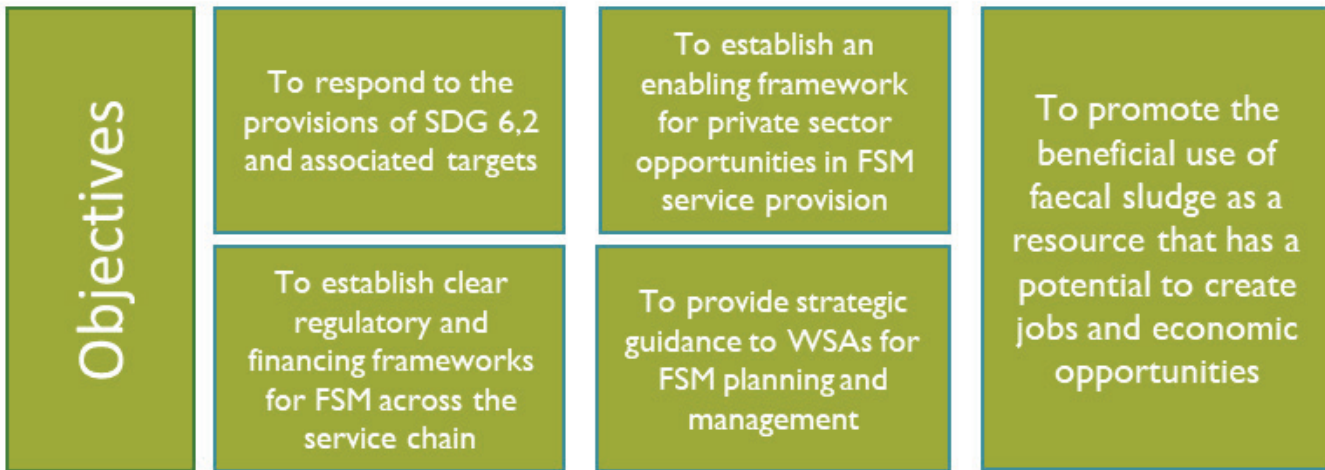
CoGTA	Cooperative Governance and Traditional Affairs
CSDA	City Service Delivery Assessment
CWIS	Citywide Inclusive Sanitation
DALRRD	Department of Agriculture, Land Reform and Rural Development
DFFE	Department of Forestry, Fisheries and the Environment
DBE	Department of Basic Education
DHS	Department of Human Settlements
DPW	Department of Public Works
DoH	Department of Health
DoT	Department of Transport
DRE	Deep Row Entrenchment
DSI	Department of Science and Innovation
DWS	Department of Water and Sanitation
DEWATS	Decentralised Wastewater Treatment System
FSTP	Faecal Sludge Treatment Plant
FSM	Faecal Sludge Management
MIG	Municipal Infrastructure Grant
MISA	Municipal Infrastructure Support Agency
NHBRC	National Home Builders Registration Council
RWP	Resilient Waters Program
SALGA	South African Local Government Association
SANS	South African National Standards
SEDA	Small Enterprise Development Agency
USAID	United States Agency for International Development
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organisation
WRC	Water Research Commission
WSA	Water Services Authority
SABS	South African Bureau of Standards
SASTEP	South African Sanitation Technology Enterprise Programme
SDGs	Sustainable Development Goals
SFD	Faecal Waste Flow Diagram
VIP	Ventilated Pit Latrine

GUIDE TO THE DOCUMENT



VISION
To establish sustainable management and regulatory frameworks for FSM in South Africa

GOAL
To mainstream faecal sludge management as part of sanitation services in South Africa



1 Introduction

1.1 Background

The National Sanitation Policy (2016) recognises **on-site sanitation as acceptable long-term and decent sanitation service**.¹ Implementing this policy results in the accumulation of faecal sludge, which must be safely managed for health and environmental reasons. Faecal sludge contains biological organisms (pathogens) that are a risk to public health and is therefore regarded as a hazardous waste. Faecal sludge needs to be managed differently from wastewater (Box 1) received from sewerage services because of its composition, hence the need for this Faecal Sludge Management (FSM) Strategy.

The FSM Strategy sets out a 10-year roadmap to safely manage faecal sludge along the sanitation service chain (Box 2) which will be reviewed in 10 years or accordingly (Figure 1). The strategy distinguishes immediate, medium- and long-term actions for six pillars: Policy, legislation, regulation and enforcement; institutional arrangements; planning; financing; capacity building, technical assistance and technology; user promotion and engagement. It concludes with a proposed implementation plan for the Strategy for FSM in South Africa.

An on-site sanitation system requires the management of faecal sludge in households and public institutions. The on-site sanitation system requires regulation of activities (such as containing waste; and transporting waste to treatment sites, treatment of waste and safe disposal or reuse). Several laws regulate these activities resulting in complexity of the strategy.

Box 2: Service chain vs. value chain

The terms **service chain** and **value chain** are sometimes used interchangeably. Service chain specifically relates to the steps required for FSM management, i.e., containment, emptying, transport, treatment, and disposal/beneficial use. When the service chain results in a product which can be used or sold, then the term value chain may be used.

Implementing FSM has additional benefits (as evidenced by recent research). It contributes to a city-wide inclusive sanitation (CWIS) approach (Box 3), “[contributing to] increases in property value and tax revenue, livelihoods, health, and economic development”.² In South Africa, the CWIS approach has been adjusted to be relevant to urban, peri-urban and rural areas in the Water Services Authority (WSA) jurisdictions.

Box 1: Faecal sludge vs. wastewater

Faecal sludge: Human excreta (faeces and urine), water, anal cleansing materials, menstrual hygiene products, and sometimes solid waste (liquid and solid contents) that accumulates in container-based vaults, pit-latrines, septic tanks, community toilets, or mobile toilets. It is **not transported** through a sewer network but is (called on-site or non-sewered sanitation.)

Wastewater: Also known as “sewage” is human excreta (faeces and urine) and flushing water, **transported directly** through a piped sewer network (sewerage) to a wastewater treatment works (WWTW).

A sewer system is also called off-site or sewerage sanitation.

1 Republic of South Africa. 2016. National Sanitation Policy. Government Gazette Vol. 39688. No. R70. Pretoria. South Africa: Government Printer.

2 Robbins, D; Ram, KES and Renzhi, N. 2019. Asian Development Bank Institute Development Case Study No. 2019-1 (July): Quantifying the Economic Spillover Effect for Citywide Faecal Sludge Management Programs [Online]. Available at: [Quantifying the Economic Spillover Effect for Citywide Faecal Sludge Management Programs \(adb.org\)](#). Accessed: 04/04/2022

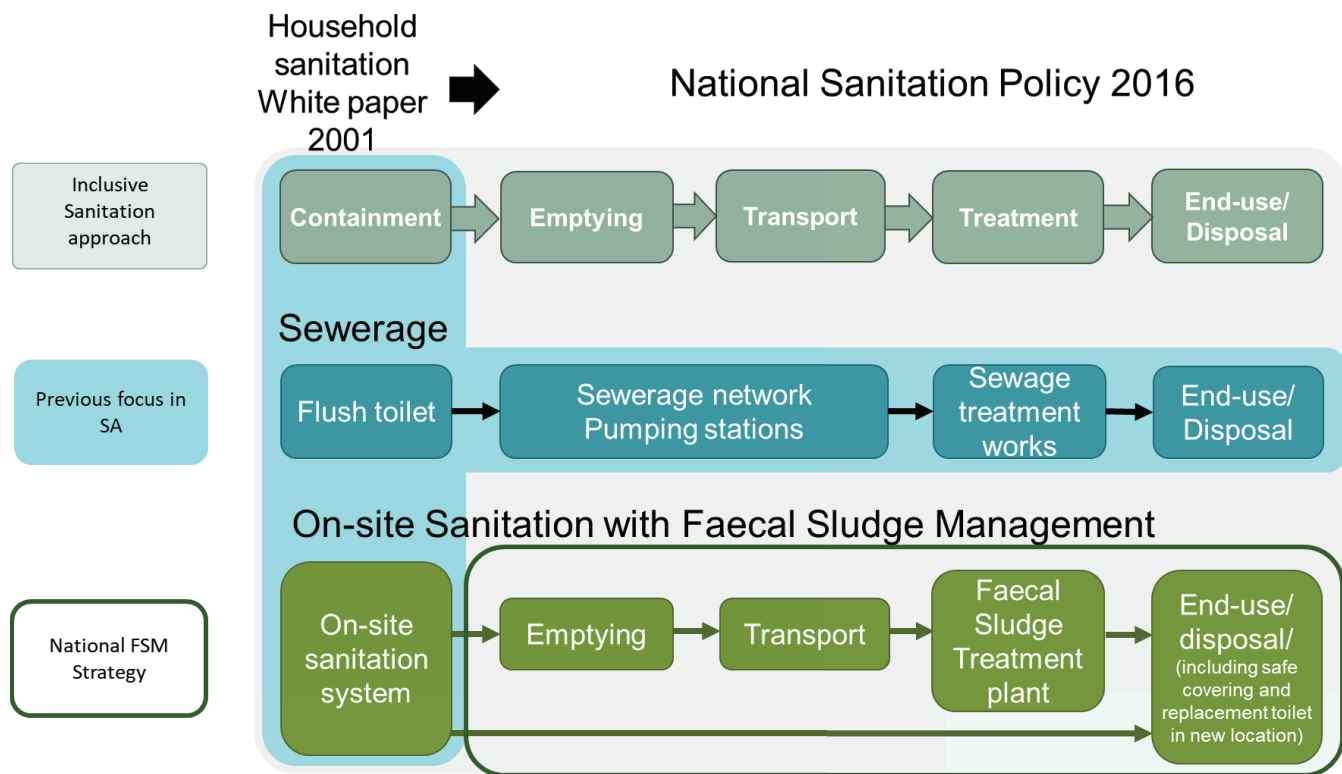
The National Development Plan for 2030 states that “by 2030, all South Africans will have affordable, reliable access to sufficient, safe water and hygienic sanitation.”³South Africa is committed to the achievement of the Sustainable Development Goals (SDGs). This is a key trigger for the National FSM strategy in the context of the “leave no one behind” 2030 Agenda, which is the basis for the SDGs.

The National Sanitation Policy of 2016 states that “sanitation services in South Africa contribute significantly to public health and are hygienic, equitable, sustainable and efficient for all people.” Faecal sludge management terminology is shown in Figure 2. A full Glossary of Terms is in Annexure 1.

Box 3: Citywide inclusive sanitation

Citywide Inclusive Sanitation (CWIS) is a public service approach to planning and implementing urban sanitation systems to achieve outcomes summarised in SDG 6.2: safe, equitable and sustainable sanitation for all by 2030, irrespective of where people live within a city or what technologies are used to serve them.

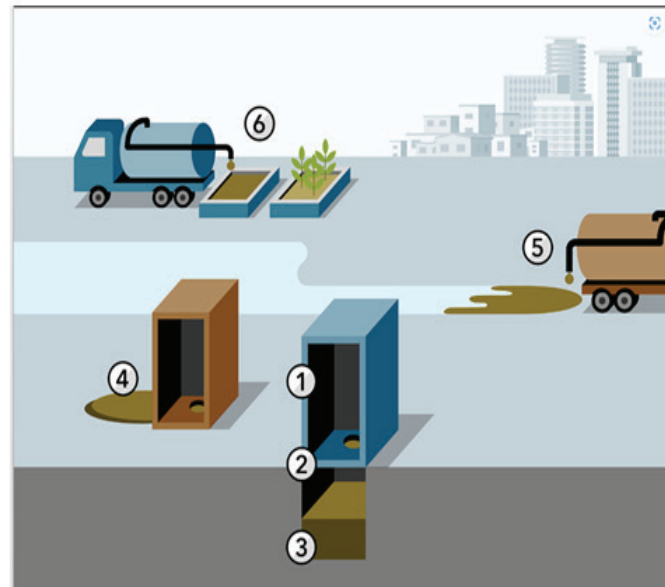
Figure 1: The sanitation service chain in South Africa



3 South Africa (Republic). August 2012. National Development Plan 2030 [Online]. Available at: [National Development Plan 2030: Our future - make it work \(www.gov.za\)](https://www.gov.za/news/press-releases/2012/08/20120820-natdev-plan-2030). Accessed: 20 July 2021. Pp 178.

Figure 2: Faecal sludge management terminology across the sanitation service chain

- Total excreta produced (1)
- faecal sludge production (2)
- faecal sludge accumulation (3)
- faecal sludge emptied directly into the environment without collection (4).
- faecal sludge collected and dumped in the environment (5)
- Faecal sludge collected and delivered to treatment (6)



[Methods to reliably estimate faecal sludge quantities and qualities for the design of treatment technologies and management solutions](#)
 Linda Strande · Lars Schoebitz, Fabian Bischoff Daniel Ddiba, Francis Okello, Miriam Englund, Barbara J.Ward, Charles B.Niwagaba
[Journal of Environmental Management, Volume 223](#), 1 October 2018, Pages 898-90

A key action of the National Water and Sanitation Master Plan is to “develop new policies and strategies on matters not previously addressed, in consultation with all stakeholders, to facilitate the sustainability of various water sector programmes” by 2025.⁴ The National FSM Strategy is a response to the Status Quo Assessment of FSM in South Africa (Supporting Document 1). It follows practical lessons from the direct use of FSM planning tools in Polokwane Local Municipality (PLM) (Box 4). The vision, goals and objectives of the FSM strategy are based on the FSM Conceptual Framework (Supporting Document 3), which incorporated lessons from South Africa and around the world.

Box 4: The Polokwane Local Municipality Case Study: Piloting FSM planning tools in Polokwane Local Municipality

Background

The mainstreaming of FSM is new in South Africa. A case study, applying globally recognised FSM tools was used to inform the National FSM Strategy and identify the current FSM status, opportunities for investment in reuse, and data to understand the implementation challenges. Polokwane Local Municipality (PLM) was selected for the case study to represent many typical South African municipalities. It includes urban, peri-urban, and rural areas that are vulnerable to climate change and has many indigent residents that qualify for free basic services.

Outcomes and lessons learned

- Current WSA planning is focussed more on sewered sanitation
- There is limited implementation of regulation by the WSA on private emptying and transport service providers
- FSM planning data collection is weak, e.g., in areas where on-site sanitation solutions are not mapped, on-site containment solutions and safe emptying services are not monitored
- On-site sanitation services are inadequately financed through the entire sanitation service chain
- Municipal bylaws do not include provisions for regulating FSM solutions or services
- The range of FSM stakeholders is not well understood, and communication structures are not well implemented

While several reuse options have been tested in South Africa, the three most viable options in PLM are co-treatment at wastewater treatment works (WWTW), deep row entrenchment (DRE), and co-composting (see Supporting Document 2: Polokwane Local Municipality (PLM) Case Study Consolidated Report)

There are weak linkages between stakeholders responsible for water security and those responsible for sanitation implementation

Incorporation into this strategy

The strategy incorporates the learnings from the PLM case study as follows:

- Communication mechanisms between primary and enabling stakeholders
- Guidance for the use of appropriate technologies
- Establishment of viable treatment and reuse options
- Development of new financing models and mechanisms
- Revision of WSA institutional structures
- Improvement of planning mechanisms
- Integration of private sector service providers

It is recognised that the National FSM strategy was developed during a time of great stress in the South African economy. The country is recovering from the COVID-19 pandemic, and resources are thinly stretched to address national and local government issues. However, the cost of not addressing FSM is high in terms of the following factors:

Morbidity and mortality: Diarrhoea and other diseases of poor sanitation have a negative economic impact on households, and society and an immense emotional cost.

Productivity: Productive time is lost both by those who become ill from exposure to pathogens in human excreta and by those who have to care for them.

Healthcare costs: People ill from sanitation-related diseases often seek help from state-sponsored healthcare, using scarce resources required for other health services.

Municipal data for planning on-site sanitation services are lacking, and at least 10% of pits were full according to StatsSA in 2018. This, coupled with the limited availability of FSM services to indigent households, can lead to a return to open defecation. South Africa has access to new, tested appropriate low-cost sanitation technologies; more are being tested through the WRC's South African Sanitation Technology Enterprise Programme (SASTEP).¹¹ However, there is a need for more guidance for WSAs on how to promote, use and deploy those technologies, and there is currently no standardised validation process.

Capacity for FSM is lacking, especially in terms of:

- Management staff for FSM at all levels of government.
- Understanding the range of appropriate on-site sanitation technologies across the sanitation service chain.
- Appropriate design of on-site solutions at the household level aligned with building norms and standards.
- Development of FSM-specific training and qualifications from local academic institutions.
- Developing adequate FSM monitoring systems, regulating on-site sanitation solutions and enforcing FSM standards throughout the service chain.

Budget allocations to water and sanitation services are heavily skewed towards water supply. The financing for sanitation services focuses more on sewerage systems than the whole service chain. Budgets are inadequate to meet both infrastructure and maintenance. Revenue from user tariffs varies from place to place, but it is rarely adequate for operation and maintenance costs. There are limited mechanisms to encourage, facilitate and sustain private sector involvement and investment in FSM services.

3 International Commitments

In 2015 the United Nations, including South Africa, adopted 17 Sustainable Developmental Goals (SDGs), each of which has several targets. SDG Target 6.2 Sanitation and Hygiene states “By 2030, 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 a vulnerable situation”. SDG Target 6.2 is tracked by the Joint Monitoring Programme, a combined WHO/UNICEF initiative. Indicator 6.2.1 is defined as the proportion of the population using improved facilities that are not shared with other households and where excreta are safely disposed of in situ or removed and treated off-site.

In addition to the SDG Sanitation and Hygiene Target 6.2, there are also global gender targets and climate change commitments that South Africa includes in its policies for implementation.

While gender equality is captured as a stand-alone goal (SDG 5), gender must be integrated across all the SDGs, and gender considerations must be included in all sustainable development work and climate action. SDG 5 aims to achieve gender equality and empower all women and girls to reach their full potential. South Africa's National Sanitation Policy (2016) highlights sanitation as a basic necessity and “*an essential pre-requisite for success in the fight against poverty, hunger, child deaths, gender inequality and empowerment.*” The policy, aligned to the Constitution (1996) and the Department's Water and Sanitation Gender Policy (1996), notes that the specific needs of women and the vulnerable must be considered in sanitation provision and recognises that sanitation interventions that are designed and managed with the full participation of women are more likely to be sustainable and effective. It also recommends that:

- Partnerships between local government, local women's groups and the private sector should be forged to overcome technical and financial barriers to women accessing urban sanitation.
- Gender mainstreaming approaches should be used in sanitation plans and sanitation services provision.
- Women should be integrated into the existing sanitation development process by targeting their needs.

¹¹ [Home - SASTEP](#). Also see Supporting Document 3: FSM Conceptual Framework.

South Africa is a signatory to the Paris Climate Accords, an international treaty on climate change. The international treaty, adopted in 2015, aims to help countries adapt to climate change effects. Under the Paris Climate Accords, each signatory country must determine, plan, and regularly report on its contributions. The Department of Fisheries, Forestry and the Environment (DFFE) is responsible for such climate change reporting for South Africa, and any impact of greenhouse gas emissions potentially mitigated as a result of FSM would need to be reported. National climate change governance in South Africa has received attention over the last 20 years, including the development of policies, strategies, regulations and institutions. The 2004 National Climate Change Response Strategy, followed by the National Climate Change Response White Paper approved in 2011, forms the foundation of national climate policy. In 2012 climate change became a key element of the National Development Plan,¹² the overarching plan for South African development. South Africa's Climate Response Policy, 2011 and the National Development Plan present a vision for an effective response to climate change. The policy is guided by the Constitution, Bill of Rights, National Environmental Management Act, Millennium Declaration and the UN Framework Convention on Climate Change.

4 Policy and legislative framework

Section 24 of The Constitution of the Republic of South Africa (Act 108 of 1996) provides that “everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected for the benefit of present and future generations”.

The Water Services Act (Act 108 of 1997) states that every Water Services Authority has a duty to all consumers or potential consumers in its jurisdiction to progressively ensure efficient, affordable, economical and sustainable access to water services. The Act recognises that on-site sanitation is an acceptable level of service.

The overarching vision of South Africa's National Sanitation Policy (2016) is that “sanitation services in South Africa contribute significantly to public health and are hygienic, equitable, sustainable and efficient for all people”. Sanitation services are clearly defined in the policy and include specific reference to “the collection, removal, treatment and/or disposal of human excreta”, which is a definition aligned to the sanitation service chain (Figure 1).

Section 146 of the Constitution provides the mandate of the national government to develop national norms and standards, frameworks and policies that provide uniformity across the country as a whole for functional areas that fall under Schedule 4. Section 9 of the Water Services Act (Act 108 of 1997) states that the Minister may prescribe compulsory National Standards relating to water services, and sanitation services.

Regarding sanitation services, the Department of Water and Sanitation is responsible to perform the function of the national regulator in conjunction with relevant stakeholders including the citizens.

Local government has the power and function to provide water and sanitation services. Municipalities designated Water Services Authorities have a constitutional duty to ensure service delivery and promote a safe and healthy environment. The Water Services Authority has several functional areas to which they must attend to including the legislative function (making by-laws and policies and setting tariffs); planning; developing infrastructure and deciding how to deliver services. These obligations are regulated by the Water Services Act (108 of 1997) and the local government legislation including the Municipal Structures Act (117 of 1998), Systems Act (32 of 2000) and Municipal Finance Management Act (56 of 2003).

South Africa intends to take progressive steps to ensure at least a basic level of sanitation for all individuals. The National Sanitation Policy (2016) policy position states that government should ensure universal access to sustainable sanitation services in all human settlements. It further states that all individuals are obligated to ensure that provision is feasible and that hygienic and sanitary practices are maintained.

¹² National Planning Commission. 2011. National Development Plan: Our future – Make it work [Online]. Available at: [National Development Plan 2030: Our future - make it work \(www.gov.za\)](https://www.gov.za/development-plan-2030-our-future-make-it-work). Accessed 27 March 2023.

In South Africa, faecal sludge management systems would complement the wastewater conveyance and treatment systems regulated by the Department of Water and Sanitation (DWS). Faecal sludge management is complex, and, in addition to DWS, various national departments including the Department of Health (DoH), the National Department of Transport (NDoT) and DFFE regulate different aspects of it.

4.1.1 Capture and Containment

The provision of a latrine facility is the first component in the sanitation service chain where faecal sludge is captured and contained. With the use of a sanitation facility, the faecal sludge accumulates over the years. Ultimately the facility must be emptied, moved or replaced. Sound design, construction and maintenance is needed to ensure the safe management of faecal sludge accumulated in the toilet.

The water services sector has to date been relying on various guidelines and strategic frameworks such as the technical guidelines for the Development of Water and Sanitation infrastructure¹³, Guidelines for Human Settlement.

Planning and Design¹⁴ (The “Red Book”), SABS 4001 for construction work, SANS 30500 for Non-Sewered Sanitation Systems and the Strategic Framework for Water Services. As the sector leader, the DWS is finalising the development of Compulsory National Standards for water supply and sanitation services.

4.1.2 Emptying and Transport

The National Environmental Management Act (Act 26 of 2014) defines hazardous waste as any waste that contains organic or inorganic elements or compounds that, due to their inherent physical, chemical, or toxicological characteristics, have a detrimental impact on health and the environment. Faecal sludge contains pathogens and is accordingly classified as hazardous waste. Waste Classification and Management Regulations in terms of National Environmental Management: Waste Act 59 of 2008 (NEMWA) requires that waste generators classify their waste under SANS 10234. The principles used in waste classification in SANS 10234 are similar to the classification method used in the Waste Management Series published by the Department of Water Affairs and Forestry, which established a reference framework standard for waste management in South Africa in terms of section 20 of the Environmental Conservation Act 73 of 1989¹⁵. The Waste Management Series details measures that must be taken for the handling, classifying, and disposing of hazardous waste.

Faecal sludge accumulates in the containment structure. After a certain period, it becomes necessary to empty the sludge. Dry on-site sanitation facilities are usually but not always emptied manually, and wet on-site sanitation facilities are usually emptied mechanically. Sanitation workers risk exposure to faecal waste when emptying facilities, whether manually or mechanically. This working environment requires compliance with the Occupational Health and Safety Act 85 of 1993. The Occupational Health and Safety Act provides for the health and safety of persons at work and the health and safety of persons in connection with the use of plant and machinery. It also deals with other people’s health and safety hazards arising out of or in connection with activities of persons at work. For example, the work area may be contaminated with faeces or soiled items taken out of the pit during emptying. Measures must be taken to clean and disinfect the work area, so it is left in a safe condition.

13 Department of Water and Sanitation (then Department of Water Affairs and Forestry. 2004. Technical Guidelines for the Development of Water and Sanitation Infrastructure. Department of Water and Sanitation. Pretoria

14 Department of Human Settlements. Revised 2018. The Neighbourhood Planning and Design Guide: The Red Book. Department of Human Settlements. Pretoria. Available at: www.dhs.gov.za

15 Costley, Dr. S. 2013. Waste Classification and Management Regulations and Supporting Norms & Standards [Online]. Presentation at the 2013 Waste Khoro. Available at: [Microsoft PowerPoint - SHAUNA WCMS Regs and Stds - Waste Khoro 4 October 2013.pptx \(dffe.gov.za\)](#). Accessed: 27 March 2023.

The transportation of hazardous waste is regulated under the National Road Traffic Act 93 of 1996, which provides for the safe transportation of hazardous waste through effective management systems and processes. The Act states that it is the waste generator's responsibility to ensure waste is packaged, transported, treated and disposed of in terms of legal requirements and that there is an auditable record of the steps involved in storing, collection and transportation. The Act incorporates several South African National Standards (SANS) codes of practice law that are relevant in transporting hazardous waste. The regulations administered by the Department of Transport and the associated SANS codes set standards for classification, labelling, vehicles and licensing and detail requirements for loading, route planning, operator agreements, emergency response, reporting of incidents and compatibility of loads.

Transporting can be done by the municipality and, or by private sector transporters permitted by the municipality in terms of its by-laws and provided they also meet the requirements of the National Road Traffic Act and the Occupational Health and Safety Act. Drivers must also be properly licensed and permitted (requiring the relevant category Professional Driver Permit (PrDP)). Transporting of faecal sludge can be provided by the municipality directly – if it has the capacity and the equipment required to deliver the service in compliance with the relevant SANS codes. Alternatively, service providers can be registered by the municipality and authorised to empty and transport faecal sludge from households at a prescribed tariff to be collected directly from the household requesting the service or from the municipality in the case of subsidised services to the indigent. The service providers would fund their equipment and be incentivized to provide the service if the tariff is high enough.

4.1.3 Treatment

Under some circumstances, burial of faecal waste on-site is an option for a household. *The Neighbourhood Planning and Design Guide* (the "Red Book"), Section K¹⁶ states that faecal sludge from pit toilets can be disposed of by burial in trenches and references a WHO diagram showing how to do that.

Other options are for a municipality to practice Deep Row Entrenchment (DRE), to process the waste at an existing wastewater treatment plant (provided they have the required licences from DWS to allow for co-treatment), or, if available, to process the waste at a dedicated Faecal Sludge Treatment Plant (FSTP).

The WRC has published *Guidelines for Deep Row Entrenchment of Faecal Sludge and Secondary Wastewater Sludge*¹⁷. However, DRE at scale requires licensing by both DFFE (through the Environmental Impact Assessment process) and DWS (through the Water Use Licensing process).

If the facility is available, faecal sludge may be received for treatment at a FSTP. The National Environmental Management: Waste Act (Act 59 of 2008) defines treatment as any method, technique or process that is designed to:

- a) change the physical, biological or chemical character or composition of waste or
- b) remove, separate, concentrate or recover a hazardous or toxic component of waste or
- c) destroy or reduce the toxicity of a waste.

Treatment should minimise the impact of waste on the environment before further use or disposal.

¹⁶ Department of Human Settlements. Revised 2018. *The Neighbourhood Planning and Design Guide: The Red Book*, Section K: Sanitation. Pretoria. Available at: www.dhs.gov.za

¹⁷ Partners in Development. May 2022. *Guidelines for Deep Row Entrenchment of Faecal Sludge and Secondary Wastewater Sludge*. Water Research Commission: TT 880. Pretoria

Treatment of waste is listed in Schedule 1: Category A of the National Environmental Management: Waste Act. The Act states that no person may commence, undertake or conduct a waste management activity without a Waste Management licence. This means establishing an FSTP may require a waste licence application before its operation. The listed activity in Schedule 1: Category A is equivalent to those activities that require a basic assessment process as stipulated in the environmental impact assessment regulations in section 24 (5) of the National Environmental Management Act (Act No. 101 of 1998). The effluent from an FSTP may have to be disposed of or discharged into a water resource. In terms of section 21 of the National Water Act (Act No. 36 of 1998), waste disposals and discharges are water uses that require a water use license unless it is listed in Schedule 1, is existing lawful use, is permissible under the general authorisation or if a responsible authority waives the need for a licence.

The National Sanitation Policy (2016) states that WSAs have the responsibility to develop an asset management strategy, maintenance and rehabilitation plan and a register of sanitation services assets and must put in place a system to manage and maintain those assets.

4.1.4 ReUse

The National Sanitation Policy (2016) recognises the economic and social value of sanitation and further encourages the reuse of the products of sanitation services. It states that where it is economically viable, the liquid, solid and gaseous constituents of wastewater and excreta end products should be used, reused and recycled for further environmental benefits, particularly energy generation.

From 2006 to 2009 the Department of Water Affairs and Forestry published guidelines for the utilisation and disposal of wastewater sludge to encourage the responsible use of wastewater sludge in agriculture. Certain management, technical and legislative aspects associated with the agricultural application of sludge (Box 6) are relevant to faecal sludge utilisation and disposal. The National Sanitation Policy (2016) states that WSAs must manage sludge in accordance with the Waste Management Series of minimum requirements (2008).

The disposal and beneficial use of sludge are addressed in the five volumes of the *Guidelines for the Utilisation and Disposal of Wastewater Sludge* published by the DWS in 2006-2009. These, in turn, draw on and interpret earlier guidelines and legislation to encourage the beneficial use of sludge. These include the National Water Act (Act 36 of 1998), the National Environmental Management Act (Act 107 of 1998), the Minimum Requirements for the Handling, Classification, and Disposal of Hazardous Waste (1998), and *A Protocol to Manage the Potential of Groundwater Contamination from On-Site Sanitation* (2003), the Waste Act (2008) and the Environmental Impact Assessment Regulation (2010), among others.

Individuals who wish to use treated effluent for agricultural purposes must have authorisation for that water use, such as a General Authorisation or a Water Use Licence in the National Water Act (Act 36 of 1998). The sludge producers must have a contract to supply liquid sludge to the user, and the sludge user applying dewatered sludge at the agronomic rate for crop production must comply with Guidelines for the Utilisation and Disposal of Wastewater Sludge Volume 2. The Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947) states that a fertiliser can only be classified as an organic fertiliser if it contains less than 20% Ash and 40% water. Treated sludge does not comply with these criteria and cannot be classified as organic fertiliser. But it will improve the soil's organic status and is referred to as a soil conditioner.

Box 6: Reuse of sludge for agriculture

Agricultural use of safely stabilised sludge includes:

- As a nutrient source or soil conditioner. An appropriate application rate can supply a crop's nitrogen needs while minimising the risk of nutrient leaching. Commercial or small-scale subsistence farmers can use the safely treated sludge.
- High-quality compost, which meets national standards, is "a saleable" product for the general public for gardening and agribusinesses.
- Treated sludge, provided it is pathogen free, can also be used by municipalities for landscaping and the improvement of soil in their parks and gardens.

Section 17 of National Environmental Management: Waste Act (Act 59 of 2008) states that any person who undertakes any activity involving the reduction, reuse, recycling or recovery of waste must, before undertaking that activity, ensure that it uses fewer natural resources compared to disposal of such waste. It further states that it should be less harmful to the environment than the disposal of such waste.

The Conservation of Agricultural Resources Act No. 43 of 1983 and compliance with the Agricultural Products Standards Act No. 119 of 1990 must also be considered. These apply where there is an interface between faecal sludge and agricultural activity, which the Department of Agriculture, Land Reform and Rural Development (DALRRD) will regulate.

5 Vision of the National FSM Strategy

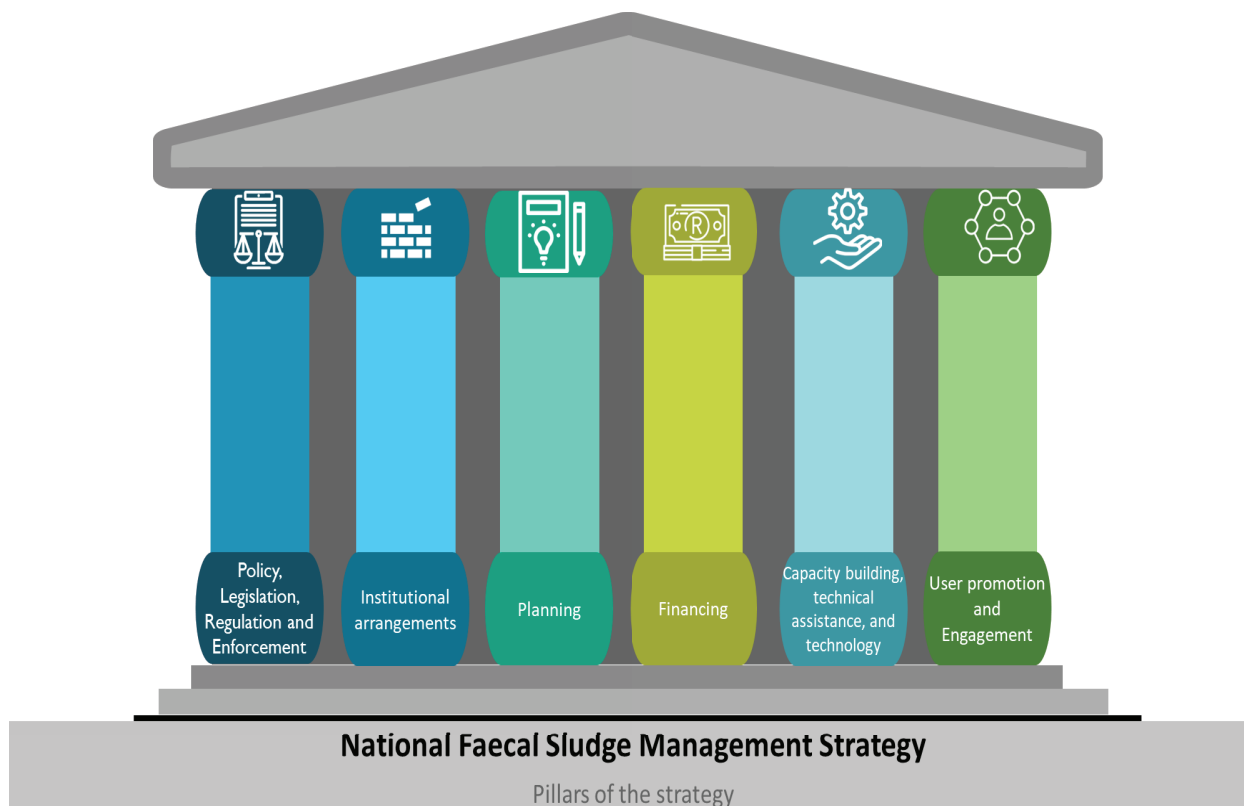
Vision of the National FSM Strategy

To establish sustainable management and regulatory frameworks for FSM in South Africa.

The National FSM Strategy is built on the six pillars (Figure 3) as follows:

- Policy, Legislation, Regulation and Enforcement
- Institutional arrangements
- Planning
- Financing
- Capacity building, technical assistance and technology
- User promotion and engagement

Figure 3: Pillars of the National FSM strategy



5 Scope of the National FSM Strategy

The National FSM Strategy is aligned with the National Sanitation Policy (2016) and focuses on achieving the full sanitation service chain for non-sewered sanitation.

5.1.1 The South African Context

The formal, planned settlements of South Africa's cities and towns are mostly sewerred. Sewered and non-sewerred sanitation services in informal urban settlements vary widely from city to city and within cities. The sanitation services used in South Africa's informal settlements include Community Ablution Blocks (flush toilets connected to sewers); VIP latrines; VIPs with conservancy tanks (i.e., non-draining pits); container-based toilets; and chemical toilets.

In addition to the 63.4% of South African households connected to sewers, 3,9% of rural and urban households, who can afford to do so, use flush toilets connected to septic tanks or conservancy tanks. A total of 19,3% households use VIP latrines and 13,4% use unimproved pit latrines¹⁸. These unimproved pit latrines vary widely in quality, safety and serviceability.

South Africa has a free basic sanitation policy, which mandates that local government provides basic sanitation to all households who cannot afford to build their toilets. The Free Basic Sanitation policy also requires that local governments service the free basic facilities by providing faecal sludge management. However, most municipalities are only starting to grapple with the implications of this policy. For more than 10 years, most government-built VIPs have been of a precast design which not only lends itself to large-scale toilet-building programs but is also meant to allow for the future dismantling and moving of the toilet when the pit is full. Many of those precast toilets have reached their end of lifespan and were due for relocation, but so far, no WSA has initiated a major toilet 'moving and rebuilding' project to ensure reliable on-site sanitation services to households.

Some toilet typologies are not designed for relocation, whereas some sites do not provide space for relocation. In these cases, there is no alternative to emptying, transport, treatment and disposal or beneficial use of faecal sludge. In this situation the faecal sludge needs to be safely buried on site in accordance with Table 1.

5.1.2 The FSM Conceptual Framework

The sanitation service chain guides the scope of the FSM strategy. The Conceptual Framework for addressing FSM in South Africa is illustrated in Figure 4 (see Supporting Document 3).

The Conceptual Framework for FSM in South Africa was based on an assessment of each of the six pillars of the strategy to identify preliminary basic, intermediate and consolidating actions to establish sustainable management and regulatory frameworks for FSM in South Africa over the next 10 years. Critical to successful implementation is a collaboration between a range of stakeholders at each stage of the sanitation service chain.

The National FSM strategy focus is to identify and prioritise short, medium and long-term strategic interventions and actions to be undertaken by stakeholders: DWS, WSAs, users (including households, schools, clinics, employers etc.), relevant departments, civil society and private service providers, such that the objectives of the strategy are achieved.

¹⁸ These figures are derived from the Department of Water and Sanitation's Water Services Knowledge System (wks) which is built up from information supplied by municipalities and then further aligned with information provided by StatsSA.

The Conceptual Framework identified sector challenges that should be addressed by interventions for each aspect of the service chain, and informs the FSM Strategy, the Status quo of FSM in South Africa, the outcomes of FSM Planning tools used in Polokwane Municipality, and the outcomes of a stakeholder consultation process on the Preliminary FSM Strategy and was further modified by the outcomes of the stakeholder consultation process for the Draft FSM strategy. The process is illustrated in Figure 5.

Figure 4: Conceptual framework for FSM in South Africa over the next ten years

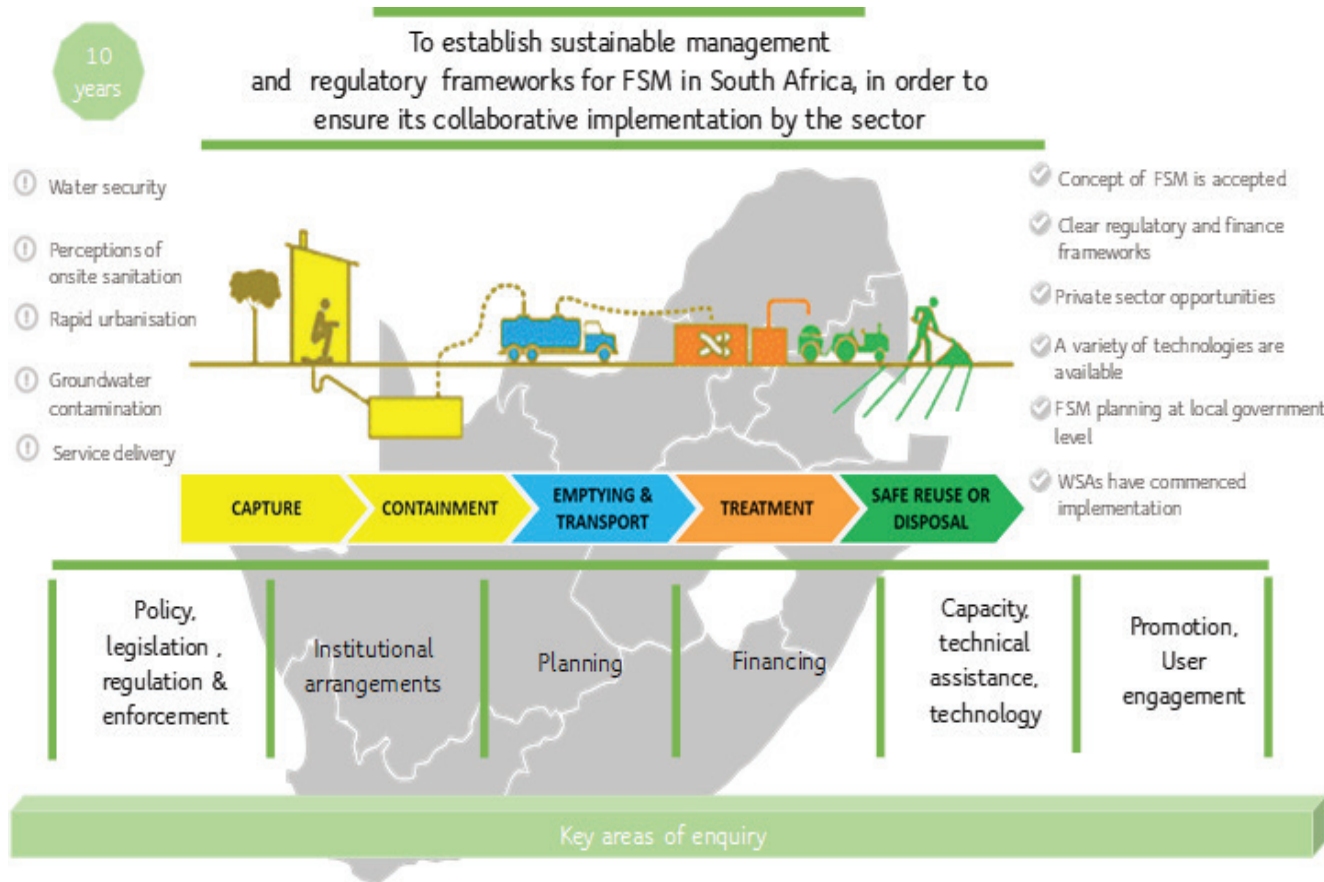


Figure 5: Development process of the National FSM Strategy for on-site sanitation systems



5.2 The Objectives

As guided by the provisions of SDG 6.2, the overall objective of the strategy is to mainstream faecal sludge management as part of sanitation services in South Africa.

Further objectives include:

- 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 WSAs concerning the management of on-site sanitation.
- To promote the beneficial use of faecal sludge as a resource, with the potential to create jobs and economic opportunities, through the sanitation circular economy.

5.3 Description of FSM in urban, peri-urban and rural areas

This strategy supports the implementation of on-site sanitation and faecal sludge management in non-sewered urban, peri-urban and rural areas. Existing service delivery models differ broadly according to location and settlement type (Box 7). Recommended service delivery models depend on the context, which differs within and across urban, peri-urban and rural areas in different geographical settings. It is recommended that local government is aware of and plans for activity that addresses the whole service chain, depending on the context and respective roles and responsibilities. A detailed assessment of existing non-sewered sanitation services by settlement type is set out in Supporting Document 1: The status quo of FSM in South Africa.

5.3.1 Urban Areas

Approximately 60% of households in towns and cities are served with piped water and sewers, but exceptions exist. These include affluent suburbs on the fringes of the cities. For example, parts of Sandton in Johannesburg, the outer western suburbs of Durban, and the informal settlements scattered throughout South Africa's cities and towns are unsewered. In some remote affluent areas, sewage is disposed of in septic and conservancy tanks. Sanitation arrangements in informal settlements vary from city to city and within cities. They include chemical toilets, pit latrines and portable toilets. FSM services do exist but are currently unreliable and inconsistent. Considerations for the development of FSM services to be applied in urban areas is presented in Table 1.

5.3.2 Peri-urban areas

Peri-urban areas are often in transition and urbanizing from rural to urban. Households may or may not be served with electricity and piped water. Roads are often unsurfaced, and there are unlikely to be sewers. Unlike the informal settlements within towns and cities, peri-urban settlements tend to be low-density. People use ventilated pit latrines (VIPs) or septic tanks according to what they can afford. In many such areas, the WSA has provided VIP toilets to most homes. The eThekweni Municipality has double-vault urine diversion toilets.

In denser, unsewered peri-urban areas, WSAs need to support the development of FSM emptying services. In supporting the service, WSA's should explore the construction of new faecal sludge treatment and disposal sites where the nearest faecal sludge treatment plants are too far away. Considerations for the development of FSM services for all unsewered peri-urban areas are presented in Table 1.

5.3.3 Rural areas

South Africa's rural areas include farmland, dispersed low density settlements and small towns. Some small towns are partially served with waterborne sanitation and are included in Section 5.1. The more affluent households use septic tanks and others use pit latrines. Owner-built pit toilets tend to be low-quality, unsanitary and unsafe. When the pit is too full to use, the maintenance approach is usually to dig a new pit and relocate the toilet top structure on the new pit. By 2021 2.7 million homes in rural areas had been provided with VIP latrines in the drive to universal access to sanitation, and most of these have been built in the last 15 years. These VIPs have been filling up, but few WSAs have sanitation policies, maintenance plans, and budgets for FSM management.¹⁹

WSAs must determine the balance based on existing service levels, geography and topology, the viability of treatment plants and faecal sludge haulage distances, annual recurring costs and the support of qualified private sector or NGO service providers where necessary. Considerations for the development of rural FSM services are presented in Table 1.

Table 1: Considerations for the development of FSM services in urban, peri-urban and rural areas

		Urban	Peri-urban	Rural
FSM services approach		FSM required in areas with septic tanks and other on-site sanitation e.g., informal settlements. Where necessary, sanitation to be progressively upgraded to more appropriate technologies.	Plots will be served by a mix of septic tanks, VIPs and unimproved pits. FSM strategy will include upgrading substandard sanitation and servicing VIPs, septic tanks and other types of non-sewered sanitation.	FSM strategy will include upgrading substandard sanitation and servicing of VIPs, septic tanks and other types of non-sewered sanitation. Where space permits, toilets may be relocated, the old pits left in place and covered with soil and a (fruit) tree planted over the old pit.
Technologies and services models		New appropriate on-site sanitation technologies should be installed in all new developments, with the necessary FSM services models for those technologies (in line with actions promoted in the National Water and Sanitation Master Plan)		
Containment typologies	Pit latrines	In densely populated areas, Ventilated Pit Latrines should be replaced with improved on-site or sewered sanitation, with the necessary FSM services models or sewerage services.	Pit latrines (including VIPs) should be emptied before they are full, ideally through a planned maintenance program. Faecal sludge should be transported to the nearest treatment facility (FSTP). In low-density areas the pit can be safely covered, and a new pit can be dug elsewhere. Alternatively, the pit can be emptied, and the sludge can be buried in a trench on site.	Pit latrines (including VIPs) should be emptied before they are full, ideally through a planned maintenance program, and the faecal sludge should be transported to a nearby treatment facility (FSTP or DRE). Alternately, space permitting, the toilet can be relocated elsewhere on the site, the old pit can be safely covered, or the pit can be emptied, and the sludge can be buried in a trench on site.
	Septic tanks	Septic tanks should be of appropriate design, well-constructed and desludged regularly, ideally every 1 to 4 years.		
Treatment		Faecal sludge should be taken to a nearby treatment facility that can receive and treat faecal sludge safely.		Faecal sludge should either be transported to a nearby treatment facility, buried in a trench on site, or transported to a centralised DRE site.

¹⁹ Still DA, Foxon K. 2012. Tackling the Challenges of Full Pit Latrines - Volume 1: Understanding sludge accumulation in VIPs and strategies for emptying full pits. Water Research Commission Report No. 1745/1/12, ISBN 978-1-4312-0291-1.

6 Roles and responsibilities for primary and enabling stakeholders

Implementing the FSM strategy and delivering the full sanitation service chain will depend on the FSM sector stakeholders effectively carrying out their roles and responsibilities. Stakeholders are categorised as follows:

- **Primary stakeholders:** Primary stakeholders are consistently involved in FSM and have key roles to play in implementing the components of the on-site sanitation service chain.
- **Enabling stakeholders:** Enabling Stakeholders have a role to play in supporting FSM implementation but are part of the enabling environment for FSM.

Primary Stakeholders are as follows:

DWS has a key role as the sector leader and regulator, guiding all aspects of the service chain.

WSAs have responsibility for ensuring and regulating FSM services in their areas (through by-laws), but they can also be services providers.

Private operators that provide emptying and transport services – and potentially treatment, reuse and disposal services (e.g., management of deep row entrenchment sites).

Users are households and institutions requiring FSM services, such as schools and clinics.

There is a range of **enabling stakeholders** notably sector departments responsible for complimentary laws, policy and regulations around waste management. The enabling stakeholders have various roles along the aspects of the service chain. For example,

- **CoGTA** is responsible for managing the Municipal Infrastructure Grant (MIG) – a potential key financing mechanism for FSTPs.
- **DFFE** is responsible for regulating the treatment component of the sanitation service chain. DFFE must also collaborate with DWS to streamline the approval process for new faecal sludge treatment and reuse options.

Examples of the roles of primary and enabling stakeholders are presented in detail in Annexure 2. Table 2 provides actions for primary and enabling stakeholders under each aspect of the service chain.

Table 2: Example roles and responsibilities of primary and enabling stakeholders across the sanitation service chain

Primary/ Enabling stake- holder	Containment		Emptying and transport		Treatment		End-use/beneficial use		Safe disposal	
	Users (including schools and clinics)	Construct, use and maintain toilets	Request and pay for emptying services	Collect faecal sludge from latrines and septic tanks	Bury waste from on-site emptying if there are no better off- site disposal options	Bury faecal sludge from pit latrines or composting toilets. Plant a tree or trees near the faecal sludge and care for the tree/s	Manage and operate a co- composting business. Make fuel briquettes from sludge	Bury faecal sludge from pit latrines or composting toilets. Plant a tree or trees near the faecal sludge and care for the tree/s	Undertake household scale DRE	Manage and Operate a DRE site
Primary stake- holders	Water service providers (WSPs)	Construct toilets	Request and pay for emptying services	Collect faecal sludge from latrines and septic tanks	Bury waste from on-site emptying if there are no better off- site disposal options	Bury faecal sludge from pit latrines or composting toilets. Plant a tree or trees near the faecal sludge and care for the tree/s	Manage and operate a co- composting business. Make fuel briquettes from sludge	Bury faecal sludge from pit latrines or composting toilets. Plant a tree or trees near the faecal sludge and care for the tree/s	Undertake household scale DRE	Manage and Operate a DRE site
	WSAs	Ensure basic sanitation standards are maintained and support the extension of sanitation to indigent households	Regulate and support emptying and transport service providers	Regulate and support emptying and transport service providers	Build, operate and maintain FSTPs. Modification of WWTWs, where viable, for co- treatment of faecal sludge	Promote and support the beneficial use of faecal sludge products. Regulate the quality of products	Promote and support the beneficial use of faecal sludge products. Regulate the quality of products	Promote and support the beneficial use of faecal sludge products. Regulate the quality of products	Allocate municipal land or enter an agreement with the private sector to allocate land for a DRE site	Allocate municipal land or enter an agreement with the private sector to allocate land for a DRE site
	DWS	Promote appropriate sanitation technologies and provide guidelines to WSAs	Develop model by-laws for safe emptying and transport	Review plans and issue licenses for the construction of FSTPs. Provide guidance for FSTP design	Review plans and issue licenses for the construction of FSTPs. Provide guidance for FSTP design	Promote, support and regulate appropriate technologies for faecal sludge beneficiation	Promote, support and regulate appropriate technologies for faecal sludge beneficiation	Promote, support and regulate appropriate technologies for faecal sludge beneficiation	Issuing of Water Use Licenses for DRE sites	Issuing of Water Use Licenses for DRE sites



Primary/ Enabling stake- holder	Containment		Emptying and transport		Treatment		End-use/beneficial use		Safe disposal	
	DPW	Manage design, construction and maintenance of sanitation at all facilities under DPW care (i.e., schools, hospitals, clinics, prisons, and other government buildings)	DoH	Advise emptying service providers on PPE for their staff	CoGTA	Encourage the use of capital grant funds to create capacity for faecal sludge treatment and co-treatment. Support capacity building for management and maintenance of FSTPs	WRC/ Agricultural Research Council	Guide safe and appropriate use of faecal sludge products in agriculture. Support related research activities	CSIR	Conduct research and develop guidelines
	Civil society	Assist in mobilisation of funds for training of toilet installation contractors	DoT	Work with WSAs to communicate transport regulations for faecal sludge to local emptying and transport service providers	SALGA	Work with WSAs to develop partnerships and facilitate investment in private-sector FSTP construction and operation	DSI	Support and promote the development of an FSTP in a WSA	DFFE/ DALRRD	Issue environmental authorisations for DRE sites/ supporting information dissemination in rural areas



7 Unlocking private sector opportunities in Faecal Sludge Management services

One of the strategy's medium and long-term objectives is to improve the utilisation of faecal sludge as a resource and to promote the beneficial use and the circular economy of faecal sludge, creating the sanitation value chain.

7.1.1 Uses of treated and untreated faecal sludge

This strategy promotes the beneficial use of treated and untreated faecal sludge, for example in agriculture or energy generation (Box 8). Agricultural use of safely stabilised sludge includes:

- **As a nutrient source or soil conditioner.** An appropriate application rate can supply a crop's nitrogen needs while minimising the risk of nutrient leaching. Commercial or small-scale subsistence farmers can safely use properly treated sludge
- **Co-composting²⁰ to produce high-quality organic compost,** which meets national standards, and is a saleable product for the general public for gardening and agribusinesses
- **Treated sludge** can also be used in landscaping, with additional pathogen management strategies if necessary

These options require consideration of the Department of Agriculture, Land Reform and Rural Development (DALRRD) regulatory framework and exploration of areas for collaboration and cooperation, with opportunities in agriculture and in rural development.

Untreated sludge can be used as a source for energy generation. In this process the sludge reaches high temperatures which kill pathogenic bacteria and eliminate potential human health risks.

Box 8: Potential contribution to sustainable development through faecal sludge products

Faecal sludge could contribute to sustainable development through:

- Utilising the calorific energy value of the sludge (generating heat)
- Utilising useful constituents such as carbon and nutrients in agricultural activities
- Extracting useful constituents such as phosphorus for agricultural practices
- Products containing sludge and incinerator ash such as bricks, cement, artificial rocks and artificial aggregates

Charcoal briquettes or pellets and high-strength industrial fuel

Manufacturing processes can ensure that products are pathogen free and free from odour.

²⁰ Co-composting is where faecal waste is combined with other waste streams such as agricultural waste, organic waste, etc., to produce compost.

71.2 Market opportunities for faecal sludge

The development of faecal sludge resource recovery systems will take time and require investment. To get some return on that investment will moreover require further investment in marketing, sales and distribution.

The Polokwane Local Municipality case study recognises that although treatment and reuse options are being tested in South Africa and globally, they are not necessarily cost effective for most municipalities within the next 10 years. While acknowledging that this will change, **the main treatment and reuse options** that are cost effective for many municipalities in South Africa are:

- Deep Row Entrenchment (at municipal and domestic levels)
- Co-treatment of faecal sludge at the Wastewater Treatment Works (WWTW), where this is possible. Box 9 explains the considerations that should be applied to the selection of the option of co-treatment.
- Co-Composting

Table 3 shows the analysis conducted in the Polokwane Local Municipality Case Study of the various reuse options for faecal sludge and their potential for use in the PLM.

Table 3: Criteria analysis of established, augments, and new faecal sludge reuse technologies in PLM

FSM Treatment Technology		Land requirement	Energy requirement	Ground-water level	Capex	Opex	Skill	Discharge standard	Failure Risk (robustness)
Established	Co-treatment at WWTW	***	**	***	*	*	*	***	**
	Re-purpose existing WWTW to a faecal sludge treatment plant	***	**	***	**	*	*	***	**
	Co-composting	*	***	***	***	***	***	***	***
	DRE	*	***	*	***	***	***	***	***
Augmenters	Unplanted drying beds (solar drying)	*	***	**	**	**	**	**	***
	Planted drying beds / constructed wetland	*	***	*	***	***	***	**	***
	Biochar & charcoal briquettes	**	*	***	**	**	**	***	**
	Vermi-composting	***	*	**	**	**	*	*	*
Relatively new	Thermal drying & pelletising (ladepa)	***	*	***	*	*	*	***	*
	Black soldier fly	**	*	***	**	**	***	**	*

Note: *** indicates the most appropriate solution to the context; * is the least appropriate to the context

The potential for beneficial use of faecal sludge should encourage responsible waste management and alleviate resource shortages. However, for faecal sludge reuse to be an at-scale solution, it must be efficiently collected at scale, financially viable and respond to a market need (Box 10).

Box 10: Lessons learned financial viability of resource recovery

In A Review of the Financial Value of Faecal Sludge Reuse in Low-Income Countries (October 2020), Mallory, Holm, & Parke assessed faecal sludge resource recovery from 112 case studies. They found that selected estimates of the potential value of treated sludge were over ten times higher than those prices from operating businesses. The reasons include product pricing against unrealistic competitors; for example, briquette prices were compared to diesel fuel. In addition, the difficulties of sales, marketing, and regulation of products were underestimated.

However, resource recovery can provide an additional income stream to encourage local businesses to enter the market. This means that local and national governments need to step in to assist with creating an enabling environment for improved FSM and faecal sludge reuse, to incentivise organisations and business to start investing in sanitation.

While there is limited data on the true costs and financial viability of faecal sludge reuse available from actual examples, some treatment and reuse options *have* been tested and are outlined in Table 4²¹.

Table 4: Tested options for the beneficial use of faecal sludge

Solid-liquid separation	Dewatering	Stabilisation and further treatment	End products and end use
<ul style="list-style-type: none"> Imhoff tanks Settling/ thickening tanks 	<ul style="list-style-type: none"> Mechanical Unplanted drying beds Planted drying beds 	<ul style="list-style-type: none"> Co-composting DRE Lime/Ammonia addition Sludge incineration Anaerobic digestion Black Soldier Fly larvae (BSF) Vermicomposting Latrine Dehydration and Pasteurization (LaDePa) Thermal drying Solar drying Planted drying beds Co-treatment with wastewater 	<ul style="list-style-type: none"> Soil Conditioner Water for irrigation Proteins Fodder and plants Building material Biofuels Building material (Bricks, cement, artificial rocks, artificial aggregates, marble-like material)

Data source: Strande, L; Ronteltap, M and Brdjanovic, D. 2014. Faecal Sludge Management: Systems Approach for Implementation and Operation. ISBN: 9781780404721. Publisher: IWAP, London

The beneficial use of faecal sludge is a new and developing field. There may be opportunities for cost recovery and for the private sector in treating and beneficial use of faecal sludge.

During the Polokwane case study, the PLM indicated that they have limited capacity for emptying and transport services. The National FSM Strategy advocates for outsourcing these services if the WSA capacity is limited. Lessons learned from international case studies are presented in Box 11.

²¹ Strande, L; Ronteltap, M and Brdjanovic, D. 2014. Faecal Sludge Management: Systems Approach for Implementation and Operation. ISBN: 9781780404721. Publisher: IWAP, London.

Most service providers use honey suckers (or vacuum tankers) where road access is available, and manual or manual-mechanical systems (such as the Gulper, Pitvaq, or Pit Screw Auger) where trucks or tankers cannot access pits. A system should be established so WSAs can manage, record and coordinate the emptying of pits with deliveries arriving at the treatment facility.

Minimising travel distance to disposal sites or WWTWs is an important consideration. Optimisation may require the installation of transfer stations. Private operators may be helpful with the identification of suitable sites for these.

In addition, it is important to establish strong regulatory frameworks to register and formalize FSM businesses and support is needed to facilitate setting up the businesses. Finally, regulatory frameworks and promotion to encourage households to regularly require emptying services will support the business development of services providers.

Box 11: Lessons learned from international emptying and transport case studies

A 2012 study by Chowdry and Kone in nine countries (five in Africa and four in Southeast Asia) indicated that emptying and transporting faecal sludge is “highly profitable”, especially where private operators have more than one truck. However, critical to the enabling environment for profitable operations of emptying services is the establishment of appropriate faecal sludge treatment facilities, the lack of which was reported as “the biggest failure of the FSM value chain”.

Disposal facilities are especially important where manual emptying services are provided. Service providers face other challenges, such as access to financing to increase the size of their fleet, poor supply chains for maintenance of vehicles and, particularly in Africa, high truck operating costs. Almost 50% of operating costs are spent on fuel.

Chowdry and Kone also indicated that in terms of the enabling environment, *“the optimum market structure is where the private businesses are taking the lead in FSM service provision, with the support of the public sector (in areas of regulation and infrastructure such as transfer stations and sludge treatment plants) in a partnership to provide quality and affordable services to all”* (Page 98).

Case Study References:

Chowdhry S and Kone D. 2012. Business Analysis of Faecal Sludge Management: Emptying and Transportation Services in Africa and Asia [Online]. Available at: 2-1662-chowdhury-2012-business.pdf (susana.org)

Trials for the beneficial use of faecal sludge through **DRE** have been conducted in Africa and Asia²². While DRE is used to safely dispose of faecal sludge, beneficial use could be achieved through commercial agroforestry and by using DRE for “green infrastructure” to improve ecosystem resilience. In South Africa, in the Sappi Forests Experiment, faecal sludge buried in trenches between rows of eucalyptus trees resulted in a 30% increase in timber volume at the end of the growth cycle and resulted in increased growth in the subsequent growth cycle²³. In Benin (community of Parakou), DRE has been used to establish artificial forests and provide ecosystem services to the community.

Disposal requires sustainable options that do not harm the environment by using non-renewable resources or leaching pathogenic or accumulative substances into the environment that exceed their assimilative capacity²⁴. Unsustainable management options include disposal practices such as stockpiles, certain landfill sites and dedicated land disposal practices.

22 Netherlands Development Organisation and the Institute for Sustainable Futures. Undated. Case Study 7: Deep Row Entrenchment: Africa and Asia

23 Neethling J et al, Long-term impacts of entrenchment of pit latrine and wastewater sludge, Final Report for WRC Project K5-2899, February 2022

24 Snyman H., Herselman J, 2006. Guidelines for the Utilization and Disposal of Wastewater Sludge, Volume 2: Requirements for the Agricultural Use of Wastewater Sludge. WRC Rep. TT 262/06. Water Research Commission, Pretoria, South Africa.

7.1.3 Financing to support FSM and private sector involvement in FSM markets

The South African government has limited experience in FSM and its funding; therefore, DWS (with the support of other sector players) need to review and/or develop financing mechanisms which support behaviour change and Water And Sanitation Hygiene (WASH) education. These support the use and sustainability of sanitation infrastructure investments and service provision.

In addition, new financing mechanisms and streamlined processes for private sector involvement and investment in FSM at the WSA level should be strengthened. The national Public Private Partnership Framework was reviewed in 2021, and new recommendations are being implemented. Among other issues, the procurement process has been streamlined, a mechanism for unsolicited proposals has been developed, and the involvement of the Municipal Infrastructure Support Agency (MISA) has been increased. These mechanisms present an opportunity – along with improved communications between WSAs and water service providers – for increased private sector involvement and investment in the sanitation value chain. DWS should support WSAs to carry out FSM planning which will, among other things, identify potential partnerships and encourage the adoption of appropriate solutions. In the Water Services Improvement Programme, currently under development²⁵, DWS recognises that WSAs will require a range of support measures in the delivery of services including the establishment of new private public partnerships – based on WSA planning – and guidance for appropriate solutions for the physical context.

In soliciting private sector involvement and harnessing its efficient management of services to the public at large, an incentive framework to support private sector involvement in faecal sludge management services should be established.

Incentives could include the following aspects:

- Registration or certification of approved FSM service providers
- Access to credit for emptying and transport service providers
- Special subsidies for low income (or better, indigent, to fit with legislation) households that use registered or certified FSM service providers
- Capacity building and training courses for community organizations that motivate households to use and maintain facilities properly
- Capacity building and training on new technologies for contractors
- Preferred supplier status for contractors that prove compliance with standards
- Access to training for WSAs on monitoring and enforcement of standards, access to planning grants for WSAs to complete Faecal Waste Flow Diagrams (SFDs) and City Service Delivery Assessments (CSDAs)
- Access to financing for private service provision to indigent households (results-based)
- Awards for schools and healthcare facilities that comply with FSM standards
- Training for private service providers to access public financing.

25 Minister of Water and Sanitation, Mr. Senzo Mchunu. 28 September 2022. Water and Sanitation Services [Online]. Presentation at the WISA Conference 28 – 30 September 2022. Available at: <https://www.dws.gov.za/>. Accessed: 27 March 2023.

Incentives will be aligned with the local context and should be applied depending on the status of the market and the service delivery context, e.g., urban, peri-urban, or rural. This strategy initiates the establishment of a framework for incentives across the sanitation value chain and develop the implementation processes.

Working with the Small Enterprise Development Agency (SEDA), DWS can establish streamlined processes for FSM service providers to access finance to enable the requirements for registration with WSAs. SEDA should also support the establishment of businesses that market and manufacture appropriate solutions in their areas, improving safe service delivery operations.

Evaluation of new financing mechanisms and drawing on existing mechanisms such as Results Based Finance (RBF) (Box 12), should be undertaken to develop a financing framework for FSM (as per the finance pillar interventions).

Box 12: Results-based financing

“Results-based funding is a form of funding for project implementation or service provision, where the principal, who provides the funding, pays the agent, who implements the project or provides the service, upon achieving predefined results” (Grittner, AM. 2013. Results-based financing: Evidence from performance-based financing in the health sector. Bonn. ISBN 978-3-88985-628-9. P. 5)

An IRC-WASH study in 2015 ([irc-wash_summary_report_january_2015.pdf](#)), indicated that RBF works ONLY if the following conditions are met:

- Governments subsidies are in place to support the desired results
- Payments are made based on measurable results
- The results (outputs) must be converted to desired impacts (i.e., RBF projects should be under a larger program designed to have the desired impact e.g., improved FSM in South Africa
- Payments should be designed to motivate delivery from service providers with the relevant capacity to do so

In addition, the report shows that the market must be in place – i.e., customers want the goods or services. Moreover, the rationale for RBF is strongest when the private sector is the service provider, unless higher levels of government wish to influence policy at local government level. An example is available from Indonesia, where the national government introduced an RBF mechanism that could be accessed by municipalities wishing to expand their services. Other conditions include bridge financing mechanisms with appropriate consideration of their risks and complexities, and the economic status of the country relative to government capacity to implement these mechanisms. Finally, the study indicates that it is not clear whether RBF is a viable mechanism at the community sanitation level.

In South Africa, an example of an RBF-type mechanism is the relatively new Impact Bond Innovation Fund ([ICRFAC – Financing Early Childhood Development: The Impact Bond Innovation Fund, South Africa - ICFRAC](#)) established by various partners to finance early child development.

8 The National FSM Strategy

For each component (step) of the sanitation service chain, the following is identified:

- Specific challenges for the component of the service chain
- Strategies that inform the action plan
- Proposed interventions and timeframes under this component over the next ten years
- The expected outcomes and targets of the strategic action plan for the component of the service chain

8.1 Containment



The overall aim of the strategy for containment (Box 13) is to accelerate the provision of appropriate sanitation solutions including the development, demonstration and validation of alternative waterless and off-grid sanitation solutions.

8.1.1 Current challenges

- Poor understanding of technical aspects, e.g., containment design, pit or tank construction and volume, quality of pit lining, access hole for emptying, and location
- Limited WSA capacity to provide guidance or to monitor and enforce building standards according to norms and standards for on-site sanitation
- Limited on-site and non-sewered sanitation options
- Makeshift pit toilets that do not meet the norms and standards/specifications.

8.1.2 Containment Strategy

- The provision, operation and maintenance of on-site sanitation facilities is a **private household's responsibility unless indigent**. On-site sanitation facilities must comply with local government by-laws as well as relevant norms and standards.
- Despite the above, the Free Basic Sanitation Policy commits the government to the provision of basic sanitation facilities to indigent households **and the ongoing operation and maintenance** of those facilities.

Proposed actions and timeframes are set out in Table 5. These interventions only refer to containment. The primary stakeholder with the responsibility to implement these actions is indicated, i.e., DWS, WSAs, households, Department of Education (schools), Department of Health (health care facilities such as clinics) etc.

8.1.3 Expected outcomes

- Building norms and standards include specifications for on-site solutions (new and existing).
- Recommended on-site sanitation options should be considered by local government, and included, in the by-laws, for local adaptation, implementation and enforcement by all WSAs.
- All WSAs map households using on-site sanitation and plans for FSM service delivery are included in their WSDP and IDPs.
- New financing mechanisms (Box 14), e.g., Results Based Finance (RBF) for local entrepreneurs and innovators developing, manufacturing and selling on-site sanitation systems, have been designed and are being tested.
- Capacity to monitor and enforce compliance in the provision of sanitation services is in place.
- Accelerate the development and uptake of innovative on-site and non-sewered sanitation solutions.

8.1.4 Targets

- A 100% of WSAs on-site sanitation solutions are compliant with norms and standards.
- All WSAs report on the on-site sanitation solutions installed in households.
- All pit latrines in densely populated urban areas have been phased out and replaced with an appropriate mix of technologies (including new technologies).

Box 14: Financing sanitation innovation

Respondents in all consultation workshops indicated that there are programs or private companies that finance innovation in their area, but many respondents indicated that they do not know of any. This highlights the need for communication between the WSA and private businesses. The need for integration between national programs, green financing, and particularly the Department of Science and innovation to promote local businesses providing containment services at the level of the household.

WSAs in all provinces indicated during the national consultation workshops that many users who can pay for services, do not. Respondents provided numerous proposals for how to improve payment from non-indigent households. This highlights the need for communication between DWS and WSAs on what is often a sensitive issue, and the need for the promotion of safe operations and maintenance of sanitation facilities at the household level.

8.1.5 Containment Strategy Actions and timeframes



Table 5: Containment – Proposed actions and timeframes per strategic pillar

	Short-term (Year 1 to 3)	Medium-term (Year 4 to 7)	Long-term (Year 8 to 10)
Policy, legislation, regulation and enforcement	<p>DWS: Review and establish or improve model by-laws addressing on-site systems and FSM services.</p> <p>DWS: Development of guidelines and standards for the selection and construction of on-site sanitation 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.</p>	<p>DWS: Incorporate FSM Key Performance Indicators (KPIs) into the Green Drop Assessment or create a dedicated FSM monitoring tool.</p> <p>DWS: Complete development of norms and standards for construction and operation of on-site facilities. Also develop, the related public health and environmental standards.</p> <p>DWS: Develop a monitoring and evaluation system for new standards.</p> <p>WSAs: Enforce compliance with local by-laws.</p> <p>DWS: Review the regulatory framework incentivise WSAs to service on-site sanitation systems and provide services to poor households.</p> <p>DWS: Work with enabling stakeholders to develop incentives¹ (and disincentives) and promotion of FSM services.</p>	<p>DWS: Design a programme to equip, train and motivate environmental health staff to enforce containment standards in households, schools and clinics.</p>
	<p>DWS: Review Model By-laws to include FSM in the entire sanitation service chain.</p> <p>WSAs: Review by-laws to incorporate new sanitation guidelines and systems.</p>	<p>DWS: Incorporate monitoring for the WSA by-laws review process in the Green Drop FSM evaluation.</p> <p>WSAs: Establish monitoring and evaluation systems for enforcement of by-laws.</p>	<p>WSAs: Enforce compliance with water and sanitation services standards through municipal by-laws etc.</p>
Institutional arrangements	<p>DWS: Develop stakeholder engagement guidelines for WSAs to identify all FSM stakeholders, form a coordinating forum for FSM, and define and agree on institutional roles.</p> <p>WSAs: Use the guidelines to engage relevant stakeholders to participate in a coordinating FSM forum.</p> <p>WSAs: Formally agree on the local institutional framework for FSM, including mandates, responsibilities and accountability.</p>	<p>DWS: Include monitoring for stakeholder engagement in Green Drop FSM evaluation.</p> <p>WSAs: Establish consistent reporting to the coordinating forum and budget for its operation.</p>	<p>DWS: Develop incentives for stakeholder participation in the coordinating forum, e.g., training contractors that consistently report to the forum and promoting FSM businesses with residents.</p> <p>WSAs: Establish regular communications with the coordinating forum and provide funds for meetings.</p>

	Short-term (Year 1 to 3)	Medium-term (Year 4 to 7)	Long-term (Year 8 to 10)
Planning	<p>WSAs: Location and monitoring and mapping of existing on-site sanitation systems in the WSA area.</p> <p>WSAs: Collect data on all on-site sanitation facilities used in the WSA area including condition of facilities and level of sludge accumulation in containments.</p> <p>DWS: Adopt a technology protocol that will guide technology innovators towards registration on the DWS database. WSAs: Backlog eradication planning to include service delivery and O&M requirements where on-site sanitation systems are installed.</p>	<p>DWS: Support WSAs in undertaking SFD, Sanitation Safety Plans (SSPs and CSDA processes).</p> <p>WSAs: Evaluate existing systems and plan new systems based on the technology framework.</p>	<p>Users: Update on new or installed on-site sanitation systems so that WSAs can include them in the planning.</p> <p>WSAs: Budgeting for installation of new and regulation of existing on-site sanitation facilities.</p>
	<p>DWS: Revise the WSDP structure to include reporting requirements for users with on-site sanitation systems (containment systems mapping).</p> <p>WSAs: Collect data on all on-site sanitation facilities used in the WSA area.</p> <p>DoH: Collect data on on-site sanitation facilities used in healthcare institutions.</p> <p>DBE: Collect data on all on-site sanitation facilities used in schools.</p>	<p>WSAs: Integrate on-site systems requirements into WSDPs and IDPs.</p> <p>DoH: Review data collected for healthcare institutions (e.g., clinics) and develop a plan for upgrading on-site systems and required services for them.</p> <p>DBE: Review data collected for schools and develop a plan for upgrading on-site systems and services to maintain them.</p>	<p>DWS: Revise the data systems for capturing new information on on-site systems in the WSDP.</p> <p>WSAs: Report to DWS on the details of on-site sanitation.</p> <p>DoH: Report to DWS on compliance with standards of on-site sanitation facilities in healthcare facilities.</p> <p>DBE: Report to DWS on compliance with standards of on-site sanitation facilities in schools.</p>
Financing	<p>DWS: Work with national and local governments to develop and apply subsidies for operations and maintenance of on-site systems servicing indigent households.</p> <p>DWS and WSAs: Work with private companies to promote the financing of sanitation innovations at the household level.</p>	<p>WSAs: Work with SEDA to support local businesses in manufacturing, selling, installing and constructing safe, quality on-site sanitation technologies.</p> <p>DoH: Budgets for managing and maintaining.</p> <p>DBE: Budget for managing and maintaining on-site sanitation systems in schools.</p>	<p>DWS: Establish ways of prioritising funding and new financing mechanisms for faecal sludge management for indigent households (beyond subsidies).</p> <p>DoH: Implement new FSM budgets in all healthcare facilities.</p> <p>DBE: Implement new FSM budgets in all schools.</p>

	Short-term (Year 1 to 3)	Medium-term (Year 4 to 7)	Long-term (Year 8 to 10)
Capacity building, technical assistance, and technology	<p>DWS: Develop and implement training for WSA technical teams on the on-site sanitation systems' approval, inspection, and monitoring.</p> <p>DWS, SETAs and Institutions of Higher Learning develop Capacity Building Programmes to manage emerging sanitation technologies.</p> <p>DWS, SETAs and institutions for higher learning develop capacity-building programmes for SFDs, Sanitation Safety Plans (SSPs) and other emerging needs.</p> <p>DWS and WSAs: Promote certified on-site/non-sewered sanitation technologies.</p>	<p>DWS, SETAs, Institutions of Higher Learning and WSAs implement Capacity Building Programmes to manage emerging and existing sanitation technologies. DWS, SETAs and institutions for higher learning implement capacity-building programmes for SFDs, Sanitation Safety Plans (SSPs) and other emerging needs.</p>	<p>DWS monitor and evaluate the impact of capacity building programmes to manage emerging and existing sanitation technologies.</p> <p>DWS monitor the impact of the capacity-building programmes for SFDs, Sanitation Safety Plans (SSPs) and other emerging needs.</p> <p>DWS and WSAs: monitor and evaluate the effectiveness of certified on-site sanitation/non-sewered technologies.</p>
User promotion and engagement	<p>DWS: Develop and publicise a decision support tool for the On-site Technology Options (for WSAs).</p> <p>DWS: Develop guidance and marketing materials for WSAs and users on selecting appropriate technologies.</p>	<p>DWS: Develop a Technology Options Framework: i.e., easy-to-read advice on the selection, installation, operation and maintenance, and management of sanitation systems (for users).</p> <p>WSAs: Promote the integration of Local Economic Development in FSM.</p> <p>WSAs: Apply Section 217 of the Constitution to ensure a transparent and competitive bid on the uptake of alternative sanitation technologies.</p> <p>DWS: Develop communications documents guiding the FSM service chain in South Africa: Households (direct and indirect), WSAs and, Service Providers.</p>	<p>DWS: Include monitoring of "safely managed"²⁷ on-site sanitation systems in national sanitation monitoring systems.</p> <p>WSAs: Implement monitoring systems for "safely managed" on-site sanitation systems in the WSA area.</p>

27 The WHO definition of safely-managed sanitation is as follows: Population using an improved sanitation facility that is not shared with other households and where excreta are safely disposed of in situ or treated off-site.
[Population using safely managed sanitation services \(%\) \(who.int\)](https://www.who.int/)

	Short-term (Year 1 to 3)	Medium-term (Year 4 to 7)	Long-term (Year 8 to 10)
	<p>DWS: Work with other government agencies (DFFE, DoH) to expand existing education outreach programmes (e.g., Good Green Deeds) to include FSM.</p> <p>WSAs: Engage with civil society, builders and local community representation to promote approved, safe and affordable on-site toilet technologies tested in South Africa (e.g., by the SASTEP platform or other WSAs).</p> <p>DoH: Work with DWS to include sanitation (specifically FSM) promotion and monitoring in all health programs, build capacity for health care workers to use promotional materials effectively, and monitor sanitation consistently in clinics and communities.</p> <p>DWS: Create a communications platform to advise of new and approved on-site sanitation technologies (toilets) coming out of testing.</p>	<p>WSAs: Engage with civil society, community representation and municipal use processes (e.g., billing processes) to promote newly approved technologies to households.</p>	<p>DWS: Work with enabling stakeholders (e.g., WRC, CSIR) and Civil Society to undertake case studies on the functioning of new on-site sanitation technologies and publicise new developments.</p>
	DWS and WSAs: Work with politicians to promote on-site sanitation technologies as an acceptable long-term solution.		

8.2 Emptying and transport



The emptying and transport (Box 15) steps of the strategy aims to ensure safe, affordable and sustainable emptying and transport services are available to all users of on-site sanitation systems.

8.2.1 Current challenges

- WSAs are not tracking how many pits are full, which means they cannot plan for future FSM needs.
- Limited registered/certified emptying services are available and there are many unlicensed service operators (Box 16).
- Very few WSAs budget to subsidise the cost of private emptying and transport of faecal sludge from indigent (poorest) households, where services are not provided by municipalities.
- There is very limited data on volumes of faecal sludge currently emptied and transported.
- Some household refuse (foreign objects) is generally disposed of in pit latrines which causes premature filling of pits and makes it difficult to empty the sludge mechanically or use the sludge for beneficial use.

- The sludge is classified as hazardous according to the National Environmental Management Act No. 36 of 1998, which makes legal transport and handling expensive.

8.2.2 FSM Emptying and Transportation Strategy

- **WSAs have FSM Plans** which identifies where emptying, and transport is needed.
- **WSA should provide an emptying and transport service or alternatively, can appoint** emptying and transport service providers.
- Private emptying and transport service providers (where a faecal sludge treatment plant is available at a convenient location) are regulated to ensure the safe disposal of faecal sludge. Therefore, private service providers **should be registered with the municipality** and DoT (if relevant, i.e., if the emptier has a vacuum truck), subject to conditions, to collect, transport, and dispose of faecal sludge. Note that the capacity to manage this process efficiently must exist at the municipality, and until this is the case, registration should be voluntary (so that private service provision as it currently exists is not interrupted).
- Collection and treatment of faecal sludge incurs costs that are **paid by the waste generators** (households) or by subsidies to indigent households, e.g., through Equitable Share or new financing mechanisms as they are developed.
- Transportation of faecal sludge **on national roads is regulated**, and DoT should enforce regulations.
- Funding should be allocated to maintain mechanical equipment and vehicles to service households.



Proposed actions and timeframes are set out in Table 6.

8.2.3 Expected outcomes

- Model by-laws are implemented and enforced for approved emptying and transport requirements in all WSAs.
- All WSAs have engaged with private service providers who are registered to transport faecal sludge on national roads as required by the legislation (national and local).
- WSAs set cost-reflective minimum tariffs in consultation with stakeholders.
- Effective incentives have been established, and disincentives are monitored and enforced.
- All service providers and WSAs have been trained in the emptying and transport requirements relevant to their areas.
- All users pay for services and use the services when required, except for indigent households, for whom subsidised services are available.

8.2.4 Targets

- A 100% of WSAs have a list of registered private emptying and transport service providers.
- A 100% of WSAs have developed and are using systems to incentivise, monitor and regulate private providers of emptying and transport services.
- All households with on-site sanitation use FSM emptying and transport services regularly in all WSAs.

8.2.5 Proposed actions and timeframes

Table 6: Emptying and transport – Proposed actions and timeframes per strategic pillar

	Short-term (Year 1 to 3)	Medium-term (Year 4 to 7)	Long-term (Year 8 to 10)
Policy, legislation, regulation and enforcement	<p>DWS: Revise model by-laws to include requirements for faecal sludge emptying and transport services</p> <p>WSAs: Review municipal by-laws to include on-site options. Identify emptying and disposal services in their municipal area</p>	<p>DWS: Develop norms and standards for FSM emptying, transport and treatment, and public health and environmental standards.</p> <p>DWS: Support WSAs to adopt and implement by-laws and registration processes in their respective jurisdiction.</p> <p>DWS: Develop M&E framework for WSA-level monitoring of emptying and transport services</p> <p>WSAs: Revise by-laws to include regulation of emptying services.</p> <p>DoH: Monitor health risks for the public and workers in emptying and transportation of FS.</p>	<p>DWS/DoT: Monitor WSAs enforcement of by-laws for emptying and transport.</p> <p>WSAs: Compliance monitoring systems established and applied to service providers</p> <p>Private FSM service providers: Integrate new standards into operational policies.</p> <p>DoH: Monitor health risks from faecal sludge for the general public and FSM workers.</p>
	<p>DWS: Develop guidelines for incentivising private FSM service providers within the WSA.</p>	<p>WSAs: Registration system to be established to incentivise and monitor private FSM providers.</p>	<p>WSAs: Establish a forum to engage private service providers to enable service delivery reporting, and tariffs are cost-effective.</p>
Institutional arrangements	<p>WSAs: Work with water service providers to inform the development of a local incentives' framework linked to licencing and use of the FSTP.</p> <p>DWS: Work with enabling stakeholders to review licensing frameworks for FSM service providers.</p>	<p>WSAs: Develop incentives for households to use and maintain on-site sanitation solutions properly.</p> <p>WSAs: Work with private FSM emptying and service providers to access new incentives and implement standards.</p>	<p>DWS: Evaluate the private service provider registration system to investigate potential for service provider licensing.</p>
Planning	<p>DWS and DFFE: Develop advisory guidelines for delineation of FSM areas: Map FSM collection and transport requirements of each area</p>	<p>WSAs: Plan service delivery (by WSA or private providers) aligned with the mapping.</p>	<p>WSAs: Report to DWS on emptying and transport service provision (and service providers appointed).</p>
Financing	<p>DWS: Provide principles for developing sanitation tariffs for WSAs, based on all users paying tariffs, except those who qualify as indigent.</p> <p>DWS: Work with Municipal councillors to promote mechanisms that improve payment for services by non-indigent households.</p>	<p>WSAs: Establish financing mechanisms to support FSM services for households that qualify for Free Basic Services through the Equitable Share allocated in the Annual Division of Revenue Act.</p> <p>DWS: Design incentives and review disincentives for safe emptying and transport for a financing framework.²⁸</p>	<p>DWS: Facilitate access for emptying and transport service providers to new financing and incentive mechanisms (see Table 10: Overall).</p> <p>WSAs: Implement incentives for private services providers.²⁹</p>

²⁸ e.g., targets for volume emptied and volume delivered safely to treatment or reuse, quality of sludge delivered to treatment

²⁹ e.g., those who reach emptying/reporting targets and enforce disincentives

	Short-term (Year 1 to 3)	Medium-term (Year 4 to 7)	Long-term (Year 8 to 10)
Capacity building, technical assistance, and technology	<p>DWS: Develop training courses for emptying and transport service providers (including municipal service provider technical staff).</p> <p>WSAs: Train municipal staff in the requirements of appropriate service provision for their areas.</p> <p>DWS, SETAs, and Institutions of Higher Learning: Develop Capacity Building Programmes for managing emerging and existing sanitation technologies.</p> <p>DWS, SETAs, and Institutions of Higher Learning, SALGA, MISA: Develop capacity-building programmes for emptying and transportation of faecal sludge at all management levels</p> <p>DWS, SETAs and Institutions for higher learning: Develop capacity-building programmes for SFDs, Sanitation Safety Plans (SSPs) and other emerging needs.</p> <p>DWS and WSAs: Promote certified on-site/non-sewered sanitation technologies.</p>	<p>DWS: Evaluate new technologies.³⁰</p> <p>DWS, SETAs, Institutions of Higher Learning and WSAs: Conduct capacity-building programmes to manage emerging and existing faecal sludge emptying technologies.</p> <p>DWS: SETAs, Institutions of Higher Learning, SALGA, MISA and WSAs: Implement capacity-building programmes for emptying and transporting faecal sludge at all management levels.</p> <p>DWS, SETAs and Institutions for higher learning implement capacity-building programmes for SFDs, Sanitation Safety Plans and other emerging needs.</p>	<p>WSAs: Train all service providers in safe emptying and that households ensure safe access to containment systems.</p> <p>DWS monitor and evaluate the impact of Capacity Building Programmes to manage emerging and existing sanitation technologies.</p> <p>DWS monitor the impact of the capacity-building programmes for SFDs, Sanitation Safety Plans (SSPs) and other emerging needs.</p> <p>DWS and WSAs: Monitor and evaluate the effectiveness of certified faecal sludge emptying technologies</p>
User promotion and engagement	<p>DWS: Work with civil society and DoH to promote the need for emptying and transport services and their payment.</p> <p>DWS: Develop guidelines for the frequency of emptying and transport services based on the containment technologies used.</p>	Ongoing user education and promotion of innovative sanitation technologies.	Ongoing user education and promotion of innovative sanitation technologies

³⁰ e.g., “Uber for Poop” or scheduling emptying technologies

8.3 Treatment

The strategy's aim for the treatment aspect (Box 17) of the FSM service chain is to ensure that all faecal sludge is safely received and treated at appropriate treatment facilities.



8.3.1 Current challenges

- There are no dedicated FSTPs in South Africa.
- Most WWTWs are not adapted or equipped for receiving and treating faecal sludge (Box 18).
- Some rural settlements are far away from WWTWs, so faecal sludge transport costs make their use uneconomic and unaffordable.
- Poor operations and maintenance (O&M) of WWTWs lead to dysfunctionality and unable to effectively treat faecal sludge/wastewater.
- Energy crisis contributes to plant failures.
- Management and capacity at WWTW often times are insufficient.
- Faecal sludge from dry on-site sanitation systems is being disposed at WWTW which are not designed to accept and treat faecal sludge.



8.3.2 FSM Treatment Strategy

- Treatment, when undertaken, is a listed activity according to the National Environmental Management Act. The regulations include the listed activities involved in the development and operations of faecal sludge treatment plants (FSTP) and, or WWTW, where co-treatment of faecal sludge and wastewater occurs.
- WSAs should prioritize the establishment of FSTPs wherever they may be necessary and able to provide a cost-effective solution.
- Where co-treatment (with sewage) is feasible, WWTWs should be modified for that purpose.³¹

Proposed actions and timeframes are set out in Table 7.

8.3.3 Expected outcomes

- Standards, guidelines and compliance monitoring and enforcement systems have been established for FSM treatment and end-use (beneficial use)
- Institutional roles and responsibilities of private sector faecal sludge treatment contracts are defined and documented
- An incentive framework for private sector participation in faecal sludge treatment has been developed
- There are active communications and information flows between private sector service providers, government and users

8.3.4 Targets

- The private sector can access financing to develop faecal sludge treatment plants.
- A 100% of WSAs have the capacity to operate and manage FSM treatment.
- An enabling framework for private sector operations of faecal sludge treatment plants is in place.

Box 18: Top 5 faecal sludge treatment options

The top five faecal sludge treatment options as ranked by stakeholders consulted in the development of this strategy are as follows:

- 1) Co-treatment with WWTW (where this is viable)
- 2) Co-composting
- 3) Planted drying beds
- 4) Deep row entrenchment
- 5) Re-purpose the WWTW to co-treat faecal sludge
- 6) Thermal drying/pelletizing

Options 1 and 2 were significantly more popular with stakeholders than the third option. Co-treatment is not always viable, however. If a WWTW is already operating at or close to its capacity limit, it has no capacity to co-treat faecal sludge. WWTW's that have spare capacity may be able to process a certain amount of faecal sludge, depending on their design. Therefore, both the WWTW and the faecal flows received by it must be assessed in order to determine its available capacity for co-treatment.

³¹ Modifications may include: The construction of a dedicated discharge point for faecal sludge equipped with screens and an equalization tank; and the addition of drying beds specifically for faecal sludge.

8.3.5 Proposed actions and time frames for faecal sludge treatment

Table 7: Treatment – Proposed actions and timeframes per strategic pillar

	Short-term (Year 1 to 3)	Medium-term (Year 4 to 7)	Long-term (Year 8 to 10)
Policy, Legislation, Regulation and Enforcement	<p>DFFE: Develop guidelines for the registration/licensing requirements for private operators of treatment plants.</p> <p>DWS: Incorporate the above guidelines into model by-laws for local adaptation.</p> <p>DWS and WRC: Initiate the development of official standards for the design construction of FSTPs.</p>	<p>DWS: Complete the development of norms and standards for the design construction and operation of on-site facilities; FSTPs, treatment, and public health and environmental standards.</p> <p>WSAs: Review by-laws for treatment.</p> <p>DFFE: Monitor the impact of FSM on the environment.</p> <p>DALRRD: Monitor adherence to standards for safe reuse of faecal sludge in agricultural activities.</p>	<p>WSAs: Monitor local faecal sludge treatment activities and establish a “dashboard” to report back to communities, users and service providers.</p> <p>WSAs: Monitor compliance (own or contractor) with faecal sludge treatment.</p>
Institutional Arrangements	<p>DWS: Develop guidelines about the institutional options for faecal sludge treatment.</p> <p>WSAs: Establish contract management systems and accountability mechanisms for faecal sludge treatment.</p>	<p>DWS: Develop guidelines for implementation of the institutional options for faecal sludge treatment.</p> <p>WSAs: Establish the structures for faecal sludge technical staff to be incorporated into the WSA's sanitation team.</p>	<p>DWS: Establish and manage a coordinating forum for faecal sludge treatment to communicate progress and new technologies across the sector.</p>
Planning	<p>DWS: Adapt existing international guidelines for co-treatment of faecal sludge at existing wastewater treatment works in South Africa.</p> <p>WSAs: Evaluate all WWTWs receiving faecal sludge and design the modifications necessary for safe co-treatment.</p> <p>Initiate co-treatment of faecal sludge in WTWs where land and capacity allow.</p>	<p>WSAs: Analyse SFDs to initiate planning, financing and procurement processes for modifications to WWTWs.</p> <p>WSAs: Initiate procurement for relevant modifications to WWTWs.</p> <p>DWS: Commence development of Terms of Reference for FSM infrastructure and services³².</p>	<p>DWS: Monitor implementation of FSTPs to allow communication of new technologies and methodologies and particular responsibilities for data collection to the coordinating forum.</p> <p>WSAs: Initiate and support planning, financing, and procurement processes for FSTPs.</p>
Financing	<p>DWS: Work with the private sector to establish results-based financing mechanisms for treatment (e.g., Corporate Social Responsibility programs).</p>	<p>DWS: Develop an incentive framework for private investors to invest in FSTPs (or modify WWTWs to co-treat FS).</p>	<p>WSAs: Allocate funding and contract the development of FSTP design and operation guidelines.</p> <p>DWS and WSAs: Develop tariffs structures for water-based solutions in urban areas, where households can pay.</p>

³¹ Incentives could include impact bonds, provision of land, tax incentives, or capacity building for approaches for financing local financial institutions to expand existing businesses. Note that incentives are relevant to the context and the market.

	Short-term (Year 1 to 3)	Medium-term (Year 4 to 7)	Long-term (Year 8 to 10)
Capacity building, technical assistance, and technology	DWS: Develop training and capacity-building plans for WSAs.	DWS: Work with research and academic institutions to develop and implement courses for FSTP operations. DWS: Work with WSAs to develop guidelines for operating manuals for FSTPs.	DWS, WRC and CSIR: Support WSAs in developing generic Terms of Reference for the design and operation construction of FSTPs. DWS and WSAs: Monitor and evaluate the effectiveness of certified FSTP technologies.
User promotion and engagement	DWS and WSAs: Engage the private sector to promote investment in faecal sludge treatment. DWS and WSAs: Engage the public to promote increased responsibility for faecal sludge reaching safe treatment. DALRRD: Alignment to Comprehensive Rural Development Program (rural end-user engagement).	DWS and WSAs: Promote and publicise progress in the development of FSTPs.	On-going: Maintain communications with the sector on new developments, technologies and methodologies for faecal sludge treatment and data collection on the impact of faecal sludge treatment.

8.4 End-use/beneficial use



End-use/beneficial use (Box 19) aims to establish an enabling framework for the beneficial use of faecal sludge products.

End-use can only be successful when, and where the sanitation service chain is fully functional and a substantial volume of faecal sludge with a high solid content is regularly collected and disposed of at the treatment plant.

Box 19: Faecal sludge beneficial use

Beneficial end use refers to the use of faecal sludge through various processes (see Section 5.3) to create a product that can be used for different purposes e.g., compost or fuel. At no point in the treatment process should faecal waste come into contact with humans or contaminate the environment. Various technologies have been tested in South Africa and new technologies are emerging.

Faecal sludge should be classified to determine the products for which it can be used.

More detail on treatment in South Africa can be found in Supporting Documents 1: Status Quo of FSM in South Africa and 2: Polokwane Local Municipality Case Study Consolidated Report.

8.4.1 Current challenges

- FSM is a new concept in South Africa, and social acceptance of using faecal sludge end-use products needs to be managed cautiously
- Faecal sludge collection and safe disposal are necessary at scale before economies can be realised for end use production, marketing and sales (Box 20)
- While there have been many studies on reuse, there are few cases of at-scale cost-effective faecal reuse products sustainably produced and sold
- The legal requirements for the beneficial use of sludge are complex and authorisation by more than one government department may be required

8.4.2 Faecal sludge beneficial end-use strategy

- Standards, guidelines and compliance monitoring and enforcement systems are established for beneficial end-use of faecal sludge.
- Where the private sector has identified an opportunity for investment in beneficial use this may be pursued using a Public Private Partnership Framework.
- Where feasible and cost-effective, WSAs may establish and operate faecal sludge treatment and end-use facilities.
- Co-treatment at WWTW may only be implemented where it is feasible to do so.

Proposed actions and timeframes are set out in Table 8.

8.4.3 Expected Outcomes

- Standards, guidelines, compliance monitoring, and enforcement systems have been established for FSM beneficial end-use
- Institutional arrangements for community-based management (waste processing) have been established
- An incentive framework for private sector participation in faecal sludge end-use/beneficial use has been developed, and investment from the private sector has commenced



8.4.4 Targets

- A 100% of WSAs have the capacity to select end-use (beneficial use) options and design and manage FSM end-use (beneficial use) operations
- FSM end-use (beneficial use) options have been implemented in at least four regions and in ten projects
- An assessment of viable reuse options, the social and economic conditions required, the scale required for sustainability and other lessons learned will be undertaken and the results disseminated to WSAs after five years
- An incentive framework for private sector participation in FSM end-use/beneficial use has been developed
- A market for FSM end-use/beneficial use products has been established in South Africa

Box 20: The FSM market

End-use/beneficial use pre-supposes the existence of both a supply chain of adequate quality and quantity of faecal sludge that can be used for different purposes and a market for FSM products.

FSM products ranked by stakeholders during the national consultation process are as follows:

- Soil conditioner
- Co-compost/vermicompost
- Animal feed
- Energy/biogas
- Construction materials

Most stakeholders indicated that they did not know any businesses that would be able to use faecal sludge products in their area, though many respondents indicated that they knew of one or two companies. This highlights the need for significant engagement with the private sector to promote the use of faecal sludge products. In order that these products can be used safely, guidelines, norms and standards must be developed urgently.

8.4.5 Proposed actions and timeframes for faecal sludge end-use/beneficial use

Table 8: FSM End-use/beneficial use – Proposed Actions and Timeframes per Strategic Pillar

	Short-term (Year 1 to 3)	Medium-term (Year 4 to 7)	Long-term (Year 8 to 10)
Policy, legislation, regulation and enforcement	<p>DALRRD, DFFE: Develop guidelines for the quality of sludge for various reuse options.</p> <p>DWS: Work with institutions to establish standards and classifications for reuse and end-use products.</p> <p>DWS: Incorporate the above into model by-laws.</p> <p>DWS: Review the legislative framework to create an enabling environment for faecal sludge end-use/beneficial use.</p>	<p>WSAs: Review and modify bylaws for end use/beneficial use</p> <p>DALRRD: Monitor adherence to standards for safe reuse of faecal sludge in agricultural activities.</p>	<p>DWS: Review legislation, regulation and guidelines and include amendments for new technology.</p> <p>WSAs: Monitor local faecal sludge treatment activities and establish a “dashboard” to report back to communities, users, service providers.</p> <p>WSAs: Monitor compliance (own or contractor) with end-use and reuse standards.</p>
Institutional arrangements	<p>DWS: Develop guidelines on the institutional options for reuse and end-use (internal WSA staff or contractors), including institutional arrangements for Community Waste Processing centres (e.g., Biocentre).</p> <p>WSAs: Establish contract management systems and accountability mechanisms for and reuse and end-use contractors.</p>	<p>DWS: Develop the institutional guidelines for WSAs to manage private contractors undertaking beneficial use.</p> <p>WSAs: Implement institutional structures and staffing requirements for management of reuse contractors.</p>	<p>DWS: Develop monitoring for private sector participation in FSM reuse.</p>
Planning	<p>DWS: Review the Protocol for sanitation and groundwater to include protocols for establishing end-use/beneficial use infrastructure.</p>	<p>WSAs: Identify sites that could be used for end-use/beneficial use production.</p>	<p>DWS: Develop a monitoring and evaluation system for monitoring the impacts of end-use/beneficial use installations.</p> <p>WSAs: Monitor and report on end-use/beneficial use in the WSA area.</p>
Financing	<p>DWS and COGTA: Review national financing frameworks to reprioritise financing for end-use/beneficial use.</p>	<p>DWS: Develop an incentive framework for private investors to invest in FSTPs, especially those combined with end-use/ (beneficial use) options.</p>	<p>DWS: Implement the incentive framework.</p>
Capacity building, technical assistance, and technology	<p>DWS: Develop guidelines for end-use/beneficial use.</p>	<p>DWS: Develop training for WSAs on monitoring of standards for reuse.</p> <p>WSAs: Identify relevant staff to receive the above.</p>	<p>DWS: Develop training for private service providers and investors on beneficial use options, implementation and monitoring.</p>
User promotion and engagement	<p>DWS: Develop a communications strategy for communicating opportunities and potential incentives.</p>	<p>DWS: Implement the communications strategy through the coordinating forum established for faecal sludge treatment.</p>	<p>DWS: Undertake impartial reviews of applying emerging technologies and communicate with the sector and potential investors.</p>

8.5 Safe disposal

The strategy's aim for the final step of the service chain, disposal (Box 21) is to enable a framework for the safe disposal of faecal waste in South Africa.

8.5.1 Current challenges

- Poor planning, lack of knowledge, inadequate infrastructure and a scarcity of sanitation service providers mean that householders opt to discharge untreated faecal sludge to the environment, posing a risk to public health and the environment.
- Where no nearby FSTP or converted WWTW is available to receive faecal waste, private sector service providers will typically practice indiscriminate dumping of faecal sludge.
- A few hazardous landfill sites accept faecal sludge, but these may be far from the emptying sites and may charge high tariffs, which then makes illegal dumping more likely.
- Untreated faecal sludge has a high oxygen demand due to readily degradable organic matter that consumes a significant amount of oxygen during decomposition. If faecal sludge is discharged into the environment, it results in oxygen depletion in surface waters.
- The legal requirements for the beneficial use of sludge are complex and the requirement for authorisation by more than one government department is an obstacle for municipalities, WSAs and the private sector.
- The DWS Protocol for Sanitation and Groundwater is inconsistently implemented. For example, some areas are considered safe for the use of VIPs, but officials may not consider them safe for on-site burial of faecal sludge. However, the evidence from the protocol is not available to officials.

8.5.2 FSM Safe disposal strategy

- Standards, guidelines and compliance monitoring and enforcement systems have been established for the safe disposal of FSM.
- Where feasible and cost-effective, WSAs may establish (and, or expand) and operate end-use or disposal services.
- Where no FSTP or co-treatment facility is available the municipality should designate an appropriate site for safe disposal of faecal sludge to reduce indiscriminate dumping, e.g., a DRE site.
- Disposal of untreated faecal sludge must comply with the treatment operator's license.

Proposed actions and timeframes are set out in Table 9.

8.5.3 Expected outcomes

- Duly authorised DRE sites have been identified where WSAs have no other safe disposal options
- These designated sites are used until FSTPs become available
- There are guidelines for the safe disposal of faecal sludge at scale
- Safe disposal of faecal sludge is well regulated, and impacts are monitored
- Opportunities for local economic development using safe disposal sites have been identified

8.5.4 Targets

- A 100% of WSAs have established safe faecal sludge disposal sites and these are used until FSTPs become available.
- Budgets for safe faecal sludge disposal have been allocated in 100% of WSAs.
- A 100% of WSAs have the staff capacity to manage the safe disposal of faecal sludge

Proposed actions and timeframes

Table 9: Safe disposal – Proposed actions and timeframes per strategic pillar

	Short-term (Year 1 to 3)	Medium-term (Year 4 to 7)	Long-term (Year 8 to 10)
Policy, legislation, regulation and enforcement	DWS: Incorporate requirements for compliance monitoring of any faecal sludge disposal methods and align to the Green Drop audit.	DWS: Formulate regulations for the burial of faecal sludge and establish compliance monitoring. WSAs: Review by-laws for treatment and disposal/reuse.	DWS: Implement compliance monitoring of faecal sludge burial sites.
Institutional arrangements	DWS: Develop guidelines on the institutional options and reuse (internal WSA staff or contractors), including institutional arrangements for Community Waste Processing centres (e.g., Biocentres). WSAs: Establish contract management systems and accountability mechanisms for and beneficial use and reuse contractors.	DWS: Develop the institutional guidelines for WSAs to manage private contractors undertaking beneficial use. WSAs: Implement institutional structures and staffing requirements for the management of reuse contractors.	DWS: Develop monitoring for private sector participation in FSM reuse.
Planning	DFFE: Identify criteria for where faecal sludge can be buried on-site or entrenched at a designated location and adapt the requirements of the WSDP. WSAs: Set aside (WSA) an approved (DWS/DFFE) safe area for DRE, faecal sludge trenching approved by DWS and DFFE that will not contaminate the groundwater while the FSTP is being planned and constructed. WSAs: Initiate DRE site procurement and development and procurement for safe “dumping sites” while FSTP infrastructure is being planned.	WSAs: Map and plan potential safe disposal sites in the WSA area – including the potential land provision to private investors and capacity-building requirements for municipal staff. DWS: Commence development of Terms of Reference for FSM infrastructure and services (e.g., DRE site development). WSAs: Integrate safe disposal planning into IDP.	DWS: Integrate monitoring of the Protocol for Sanitation and Groundwater into FSM monitoring systems (e.g., Green Drop). WSAs: Establish data collection systems for safe disposal sites and periodic review of the Protocol for Sanitation and Groundwater.
Financing	DWS and COGTA: Review national financing frameworks to reprioritise financing for end-use/beneficial use.	DWS: Develop an incentive framework ⁷ for private investors to invest in FSTPs, especially those combined with end-use/beneficial options.	WSA: Reallocate budgets based on the planning of safe disposal sites.
Capacity building, technical assistance, and technology	DWS: Develop training modules for the Guidelines for DRE and develop the guidelines for other methods of safe disposal.	DWS: Develop training for WSAs on monitoring of standards for and safe dumping sites. WSAs: Identify relevant staff to receive the above training and allocate their time to undertake it.	WSAs: Identify relevant staff to undertake training on the management of safe disposal sites and ensure that only trained staff are operating sites.
User promotion and engagement	DWS: Promote the Guidelines for Deep Row Entrenchment of Faecal Sludge and Secondary Wastewater sludge.	WSAs: Work with emptying and transport services providers to ensure disposal at safe disposal sites.	DWS and WSAs: Promote new methods and technologies for safe disposal to stakeholders through the Coordinating forum and in the WSAs.

9 Summary of the key points of the National FSM Strategy

FSM is a new concept in South Africa, and this ten-year strategy aims to establish the relevant regulatory and management framework with collaborative implementation by the sector (Box 22). It is based on applying on-site sanitation and safe FSM in appropriate circumstances as a decent, long-term sanitation service level in urban, peri-urban and rural areas.

Box 22: Readiness to implement: The space for change

The FSM Strategy is a document about change. During the second round of national stakeholder consultations, the “Change Space” exercise from the Harvard Business School Problem-driven Iterative Adaptation (PDIA) Toolkit (https://bsc.cid.harvard.edu/files/bsc/files/pdiatoolkit_ver_1_oct_2018.pdf) was used to evaluate readiness to implement the short term interventions under each pillar of the strategy.

This exercise evaluates three factors – the 3As: Authority, Acceptance, and Ability. The maximum overlaps between these three factors is the maximum potential for change – the change that is needed to implement the strategy.

If one or two of the above factors is low or medium, the required space for change does not exist, and the relevant factor will need to be strengthened before implementing the intervention.

The 3As are defined as follows:

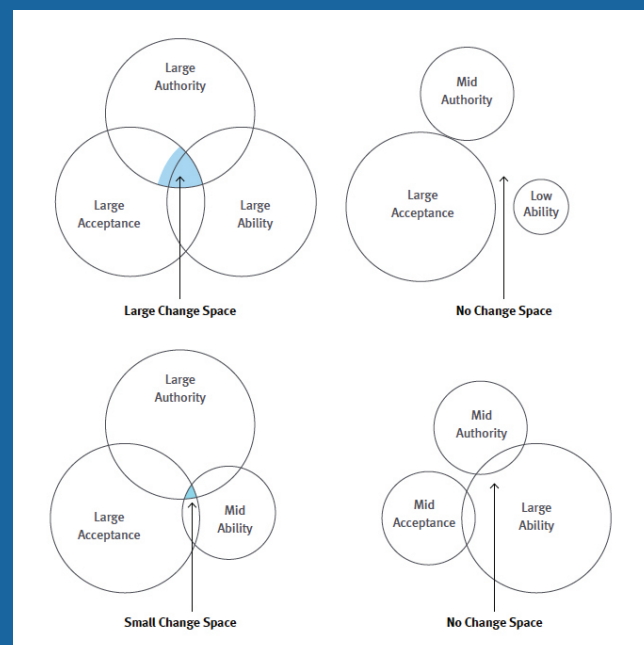
Authority: The support needed for reform or policy change (political, legal organizational or personal). It is important to assess the authority one has and the gaps that need to be closed before implementing an intervention.

Acceptance: The extent to which those impacted by the change, accept the need for change and the implications of that change. The key is to recognize what acceptance exists and what gaps need to be closed to foster change.

Ability: The practical side: the need for time, money, skills etc. to implement any kind of intervention.

The “change space” is the level of effort needed to effect change or increase the space where all the circles overlap. It is defined whether each factor is assessed as low, medium or large – as per the figure below:

Respondents in the workshops indicated the potential for change by evaluating the size of each factor based on the stakeholder category they represented.



Currently, regulations specifically address the containment aspect of on-site sanitation, but regulatory standards are needed for the whole FSM service chain. This strategy allows WSAs to include FSM in budget allocations and planning across the service chain. In addition, at a national level FSM support and regulation should have allocated budgets to ensure safe management thereof. Notwithstanding the range of interventions presented in this document against each of the strategy pillars, a summary of the priority actions to initiate the implementation of the strategy is set out in Table 10.

Table 10: Summary of priority issues

Pillar	Priority action
Planning	WSA planning processes for the compilation of SFDs /CSDAs to be implemented as soon as possible and integrated into existing municipal planning processes.
User promotion and engagement	Communication and education about on-site sanitation policy – dispelling myths and ensuring understanding of the FSM service chain at all levels.
Institutional frameworks	Inter-governmental cooperation with clear roles and responsibilities.
Capacity building, technical assistance, and technology	Amendment of existing or development of new guidelines on technology options (including ICT options and considerations for not over-designing technical solutions).
Policy, legislation, regulation and enforcement	Enforcement of norms and standards where there is health and environmental risk.
Financing	Prioritisation of public conditional grant funding for FSM services.

The largest stakeholder category attending the consultation workshops was WSAs. Their assessment of their readiness to implement the interventions in the short term is set out in Table 12.

Table 11: Summary of interventions per strategic pillar

Pillar	Short-term	Medium-term	Long-term
Policy, legislation, regulation and enforcement	Develop by-laws, guidelines, norms and standards where there are gaps in the service chain.	Develop and establish monitoring systems for new guidelines, norms and standards.	Implement regulation and enforcement of guidelines, norms and standards.
Institutional arrangements	Design the structure for local-level FSM coordination mechanisms (stakeholder roles and responsibilities), including incentives for the participation of various role players and a communications strategy.	Establish multi-stakeholder formal coordinating forums with clear roles and responsibilities at the WSA level with clear reporting to the national level.	Review institutional arrangements against the service chain as new guidelines, norms, standards and regulations are implemented.
Planning	Mapping of on-site sanitation systems and services across the service chain.	Application of FSM planning tools to integrate FSM planning into WSDPs and IDPs.	Reporting on and benchmarking of FSM service delivery.
Financing	Review national financing mechanisms to incorporate FSM services requirements and identify relevant subsidies.	Design incentives and review disincentives (e.g., fines for illegal dumping) for private sector service providers, investors and households.	Benchmark municipal financial flows for FSM services and implement the incentives framework.
Capacity building, technical assistance, and technology	Training for WSAs on implementation of FSM tools and engagement with academic and learning institutions to develop an array of FSM courses, e.g., training for contractors on installation of on-site solutions.	Implementation of training courses for relevant stakeholders and development of training and capacity building for new technologies.	Review of new technologies across the service chain and development of the relevant training for them.
User promotion and engagement	Develop a framework for FSM “Technology options” across the service chain, with attached promotional materials.	Work with civil society and other programmes (e.g., Good Green Deeds) to promote and publicise safe and effective FSM services and relevant on-site systems options at the WSA level.	Establish a feedback mechanism at WSA level to promote new technologies and investment opportunities for FSM services across the service chain.

Table 12: Stakeholders' evaluation of their readiness to implement interventions

Pillar and intervention/ Stakeholder category	WSAs and Municipalities' evaluation of readiness to implement
Policy, legislation, regulation and enforcement: Develop by-laws guidelines, norms and standards where there are gaps in the service chain.	Some municipalities shared that the main challenge is around the ability to deliver. WSAs need to be assisted to develop their ability since acceptance and authority are not an issue around the need for guidelines. An integrated approach, informed by research, between national government and WSAs to develop guidelines is essential. There is a need to develop municipal sanitation officials' knowledge and capacity regarding on-site sanitation systems. Educational programs are needed for both communities and political leaders. Effective public participation processes should be implemented before developing any guidelines.
Institutional arrangements: Design the structure for local-level FSM coordination mechanisms (stakeholder roles and responsibilities), including incentives for participation of various role players and a communications strategy.	The main challenge concerns community acceptance and capacity building on stakeholder engagement. Some municipal stakeholders recommend improving community engagement skills to ensure individuals are good at public participation engagement.
Planning: Mapping of on-site sanitation systems and services across the service chain.	Municipalities raised the lack of skills and capacity to map on-site sanitation systems as a potential issue for some of them. Some municipalities request additional support for planning and building internal capacity to deal with and raise awareness of FSM, to develop skills among councillors (to see the benefits of mapping). There is a risk this intervention may be neglected due to the shortage of critical skills and political will.
Financing: Review national financing mechanisms to incorporate FSM services requirements and identify relevant subsidies.	Municipalities need political will, capacity and funding conditions to allocate funding and budgets for FSM. This requires buy-in from the decision makers like the Council and top management of the municipality. Relevant officials need capacity building, and their performance should be monitored quarterly.
Capacity building, technical assistance, and technology: Training for WSAs on implementation of FSM tools and engagement with academic and learning institutions to develop an array of FSM courses e.g., training for contractors on installation of on-site solutions.	Municipalities see the main challenge to be around awareness and capacity building. Municipal staff require the right resources, technical skills, capability, and additional funding sources to implement this review. Masterplans should be developed in line with water board operations. Awareness campaigns must ensure that communities get involved in the planning and implementation of the FSM. There should be an economic incentive which will better motivate and drive decisions to implementation.
User promotion and engagement: Develop a framework for FSM technology options across the service chain, with attached promotional materials.	Most municipalities see the development of a framework for FSM "technology options" with promotional materials as part of their authority and remit. Acceptance of this intervention among municipal staff may also be a challenge. Senior management staff of municipalities need to enforce this within their own teams. The skills gap can only be reduced by employing qualified and experienced staff and offering them training budgets to improve their capacity to deliver on this intervention. The involvement of existing FSM providers and engineers will be needed to develop the Technology Options framework. Some municipal stakeholders referred to outsourcing this to external service providers specialised in marketing and promotional campaigns.

10 Monitoring and evaluation framework

The detailed monitoring framework can only be developed after the sector has agreed upon the strategic action plan; however, DWS is already implementing various monitoring programmes as follows:

- The National Chemical Monitoring Programme assesses the status and trends of water resources' chemistry.
- The National Microbial Monitoring Programme assesses trends of faecal pollution and associated health risks.
- The National Eutrophication Monitoring Programme assesses trophic status, risks and trends of single impoundments, the river reaches or canals.
- The National Toxicity Monitoring Programme is currently being designed to assess the status and trends of toxicity and toxicants in water resources.

A National Radioactivity Programme is currently in the testing phase.

In addition, DWS implements economic regulation of WSAs through the Integrated Regulatory Information System and the Green Drop programme, which is focused on performance audits of wastewater facilities.

As far as possible, existing monitoring mechanisms should be used. A key component of this strategy is implementing SFDs with a CSDA report in every WSA in the short term. These tools will deliver significant data at the WSA level, serving as a basis for regional/provincial and national level reporting. This data obtained can be aggregated at regional and national levels, but the SFD is better applied at the WSA level. The considerations and assumptions should be well documented at local, regional and national levels.

Data relevant to the strategy available from existing monitoring programmes should be assessed and built into the monitoring framework for the FSM strategy.

10.1 FSM INDICATORS

Table 13 sets out the indicators for monitoring the National FSM Strategy, the level at which they should be monitored, the monitoring scale and frequency of monitoring.

The implementation of this strategy should allow South Africa to report globally on the SDG targets, especially the indicator:

Use of improved facilities that are not shared with other households and where excreta are safely disposed of on-site or removed and treated off-site

This strategy would enable measurement against: *Proportion of the population receiving safely managed sanitation services* for the national target of 100% affordable, reliable access to sufficient, safe water and hygienic sanitation by 2030.

Table 13: Preliminary FSM indicators

Indicator	Monitoring level	Frequency of monitoring (over strategy period)	Monitoring scale		
			Short term (3 years)	Medium term (7 years)	Long term (10 years)
Proportion of WSAs with a credible SFD graphic and report compiled by the municipal team	Provincial	Annual	0-25% WSAs	25-75% WSAs	100% WSAs
Number of documented FSM decisions the WSA has made using the outcome and contents of the SFD report	WSA	Annual	0-2 decisions	3-5 decisions	More than 10 decisions
Proportion of WSAs with an FSM team established and operational	Provincial	Annual	0-25%	25-75%	100%
Level of activity of FSM teams (measured by total of team meetings, significant decisions, workshops, training or field visits per month)	WSA	Annual	1 or none	2-5	Over 5 activities
Proportion of households in the WSA using Ventilated Pit Latrines that have full pits	WSA	Annual	Over 75% households or Do not know	Over 25% households	Less than 5% households
Proportion of WSAs reporting the FSM component aligned to Green Drop audits	Provincial	Aligned to Green Drop audits	0-25% WSAs reporting	25-75% WSAs reporting	100% WSAs reporting
Number of private sector partnerships (service providers and, or licensed operators) in each aspect of the FSM service chain	WSA	As at 5 years from adoption and at the end of the 10-year period	1 or none	2-5	More than 6
Proportion of capital grants and operational subsidies allocated to safely managed sanitation. Note: Separate reporting of capital grants and operational subsidies	Provincial	Annual	Marginal increase or no change	More than 5% increase	More than 10% increase
Proportion of WASH sector financial flows spent on safely managed sanitation	National	Annual	Marginal increase or no change	More than 10% increase	More than 30% increase
Proportion of WSAs with safely managed sanitation over 80% (according to the SFD)	Provincial and national	Annual	Less than 20% WSAs	More than 20% WSAs	More than 50% WSAs
Number of WSAs that have planned and budgeted for faecal sludge management in their WSDP and IDPs	Provincial and national	Annual	Less than 25% WSAs	25-75% WSAs	100% WSAs

National FSM Strategy: Annexure 1

National FSM Strategy: Annexure 1

Glossary of Terms

BASIC SANITATION SERVICE: The provision of a basic sanitation facility which 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.

CITYWIDE INCLUSIVE SANITATION (CWIS): A holistic approach to sanitation that includes all forms of sanitation within a given town or city, i.e., it goes beyond the traditional focus on sewer networks and wastewater treatment plants.

CITY SERVICE DELIVERY ASSESSMENT (CSDA): A tool to assess why the sanitation situation in a given town or city is as it is. It supports a systematic process for working with stakeholders to assess the enabling environment for citywide inclusive sanitation, and to present the results in a simple and accessible way.

CO-COMPOSTING: A term used to describe the process of combining sludge (faecal sludge or different types of WWTP sludge) with organic matter and soil to produce compost.

CO-TREATMENT: A term used to describe the treatment of faecal sludge in a Wastewater Treatment Plant (WWTP). A WWTP is able to process a certain amount of faecal sludge, depending on the WWTP design and the nature of the faecal sludge.

CONTAINER BASED SANITATION (CBS): A sanitation Service which provides toilets that collect human excreta in a sealable, removable containers on a regular basis which are transported to a treatment facility.

DEEP ROW ENTRENCHMENT (DRE): A term used to describe the burial of faecal sludge or WWTP sludge in trenches or pits, when done correctly is a safe practice, as opposed to the illegal dumping of faecal sludge, which is not. Thus buried, the sludge increases soil fertility by increasing levels of carbon, phosphorous and other micro-nutrients.

FAECAL SLUDGE: Are 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 which are products of the wastewater treatment process.

FAECAL SLUDGE MANAGEMENT (FSM): The management of human excreta from on-site systems, excluding package plants along the sanitation value chain which includes containment, collection, transportation, treatment, safe disposal or reuse.

FAECAL SLUDGE TREATMENT PLANT (FSTP): 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.

LEACH PIT: An underground pit or receptacle into which wastewater can discharge and from which the liquid can seep into the surrounding soil with little or no treatment.

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/in the household).

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.

NON-SEWERED SANITATION: The system that is not connected to a networked sewer, and collects, conveys, and fully treats the specific input to allow for safe reuse or disposal of the generated solid output and or effluent.²⁷

PORTABLE AND MOBILE TOILETS: The toilets which can be moved either manually or with lifting equipment. They are not connected to a sewer pipe, to a pit or to a septic tank. While they are mostly associated with temporary sanitation provision, well designed and well managed container-based toilets can provide a short-term sanitation solution.

SAFE MANAGEMENT OF HUMAN EXCRETA: The containment, emptying, and transportation of excreta to a designated disposal or treatment site, or the safe re-use of excreta at the household or community level, as appropriate to the local context²⁸.

SAFELY MANAGED SANITATION SERVICES: The population using an improved sanitation facility that is not shared with other households, and where excreta are either: (i) treated and disposed of in-situ; (ii) stored temporarily and then emptied and transported to treatment offsite; or (iii) transported through a sewer with wastewater and then treated offsite²⁹.

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 others, 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: For the on-site sanitation systems, this typically comprises excreta capture and containment in a latrine pit or septic tank; emptying of the pit or tank; transport of the contents; sludge treatment; end-use or final disposal of the resulting products.

- i) **CAPTURE AND CONTAINMENT:** Containment/capture of faecal sludge on-site is the first step of faecal sludge management along the on-site sanitation service chain. There are a range of possible containment technologies for faecal sludge, the most common of these are:
 - d) on-site septic tanks, which retain solids, supernatant liquid and scum, and are regularly desludged.
 - e) pit latrines, which retain faecal sludge (only solid) in a pit and the partly digested faecal sludge is removed at infrequent intervals, depending on the size of the pit and usage.
 - f) non sewered sanitation systems, which retain faecal sludge and allow its input transformation into a safe material, able to be removed manually.

27 SANS 30500, as its full title Non-sewered sanitation systems — Prefabricated integrated treatment units — General safety and performance requirements for design and testing implies, is a standard for a specific subset of non-sewered sanitation technologies, defined in the standard as follows:

A prefabricated integrated treatment unit, comprising frontend (toilet facility) and backend (treatment facility) components that:

- a) 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
- b) is not connected to a networked sewer or networked drainage systems.

28 World Bank. 2016. World Faecal Sludge Management: Diagnostics and Guidelines for Service Delivery in Poor Urban Areas [Online].

Available at: [FSM0Summary0Report.pdf?jsessionid=27398BECC4360CEC6D25BA4EE795F2B0 \(worldbank.org\)](https://www.worldbank.org/FSM0Summary0Report.pdf?jsessionid=27398BECC4360CEC6D25BA4EE795F2B0). Accessed: 20 July 2021

29 World Health Organisation. 2018. Guidelines on Sanitation and Health.

ISBN 978-92-4-151470-5. Geneva, Switzerland.

- ii) **EMPTYING AND TRANSPORTATION:** The removal of faecal sludge from on-site systems and transportation to a treatment or disposal facility are the second and third steps in the sanitation service chain for faecal sludge. Sludge can be removed by mechanical means or manually: the specific method depends on the type of containment system, the local climate, access to the site, the type of equipment used by the service provider, and their level of expertise. Similarly, transportation to a disposal facility can be done through a combination of manual and mechanical means.
- iii) **TREATMENT AND REUSE:** The treatment and beneficial use of products derived from faecal sludge are the final stages in the sanitation service chain. Faecal sludge treatment starts with separating the solid from the liquid through mechanical or biological means. Biological treatment includes stabilization ponds, drying beds and constructed wetlands, while mechanical treatment involves mechanized processes such as activated sludge, up-flow anaerobic sludge blanket (UASB) reactors, and anaerobic digesters. After treatment, faecal sludge can be used beneficially in several ways, for example: as part of a compost mix; as a soil conditioner; or as fuel if made into briquettes. It is important to note that appropriate reuse options are limited by the method used for sludge treatment, and also by the type of sanitation system from which the faecal sludge is derived. After treatment and before use the faecal sludge product needs to be classified to determine appropriate beneficial use.

SEPTIC TANK: An in-house full flush toilet connected via pipe and plumbing fixtures to an underground watertight settling chamber (digester) with liquid outlet to a subsoil drainage/ soakaway system.

SHIT-FLOW DIAGRAM (SFD): An easy-to-understand advocacy and decision-support tool comprising a report (SFD Report) which contains a graphic (SFD Graphic). The SFD Graphic is a visual representation that enables stakeholders to identify service outcomes in terms of the flow and fate of excreta produced by the population.

URINE DIVERTING DRY TOILET: A type of sanitation facility with pedestal designed to separate the urine and faeces wastes.

VENTILATED IMPROVED PIT (VIP) LATRINE: A sanitation facility in which human excreta drops into a pit. A black pipe (vent pipe), with a screen (flyscreen) at the top outlet of the pipe, is fitted to the pit.

WASTEWATER/SEWAGE: The water containing waste or water that has been in contact with waste material.

WASTEWATER TREATMENT PLANT (WWTP): A plant designed specifically or predominantly for the receiving and processing of sewage from a waterborne sewage system.

ANNEXURE 2: KEY FSM STAKEHOLDERS

The successful implementation of the strategy will depend on the Faecal Sludge Management (FSM) sector stakeholders effectively carrying out their roles and responsibilities in the sector.

Key stakeholders are mapped against the FSM Service Chain. It is critical to distinguish between primary and enabling stakeholders.

Primary Stakeholders

Primary Stakeholders are consistently involved in FSM and have key roles:

Department of Water and Sanitation (DWS) has a key role as the sector leader and regulator, providing guidance on all aspects of the service chain.

Water Services Authorities (WSAs) have a responsibility for ensuring and regulating FSM services in their areas (through bylaws), but also are services providers.

Private operators that provide emptying and transport services – and potential treatment, reuse, and disposal services (e.g., management of deep row entrenchment sites).

Users who are essentially households and institutions which require FSM services, such as schools and clinics.

Table 1 indicates the detailed roles of each of the primary FSM stakeholders relative to the sanitation service chain.

It should be noted that DWS is in the process of engaging private stakeholders during the development of this strategy. This engagement process is ongoing and will be strengthened and focussed in the second consultation process (before the strategy is finalised). The outcomes of this process will be used to develop a set of guidelines for engaging private service providers at the local level and inform the financing and institutional frameworks to be established by this strategy. The development of the guidelines is a key short-term intervention in the implementation plan (Overall strategy: Institutional arrangements). The results of the case study undertaken in Polokwane Local Municipality, which identified private stakeholders participating in FSM in the area (see Annexure E), and the private sector stakeholders that attended the first round of consultation workshops will be used as a basis for the guidelines.

Enabling Stakeholders

Enabling Stakeholders only provide input as and when needed. They have no line function in FSM implementation but are part of the enabling environment for FSM. For example, Cooperative Government and Traditional Affairs (CoGTA) is responsible for managing the Municipal Infrastructure Grant (MIG) – a potential key financing mechanism for Faecal Sludge Treatment Plants (FSTPs). Department of Forestry, Fisheries and the Environment (DFFE) is responsible for the implementation of Operation Phakisa: Chemicals and Waste Economy Programme. This programme is aimed at reducing impacts on the environment while contributing to economic growth and could support testing and implementation of FSM re-use projects.

Table 5 sets out detailed roles of enabling FSM stakeholders relevant to the sanitation service chain.

Table 1: Roles of primary FSM stakeholders relative to the sanitation service chain

PRIMARY STAKEHOLDERS						
Stakeholder	Containment	Emptying	Transport	Treatment	Re-use	Disposal
On-Site Sanitation owners/ households	Ownership and sometimes payment for facilities, minor maintenance, except in indigent households	Payment for emptying service (cost may be subsidised)	Payment for transportation service (cost may be subsidised)	No role unless human excreta is left buried on site, in which case a tree or trees may be planted over or near the waste and the homeowner will then protect and care for the tree/s, and benefit from the whatever the tree produces (e.g., shade, fruit, firewood)		
Water Service Provider	New construction, also refurbishment of existing structures where needed	Emptying of Faecal Sludge (FS) where required	Transport of FS where required	Operation of FSTPs	Operation of waste beneficiation systems	Disposal of faecal sludge
WSAs	<p>Planning and implementation of sanitation service in the entire sanitation value chain</p> <p>Promote approved non sewered sanitation systems appropriate for all settlement types</p> <p>Adherence to the requirements of a protocol to manage the potential of groundwater contamination from on-site sanitation</p>	Empty FS, monitor and regulate	Transport FS, monitor and regulate	Operation of FS treatment works	Beneficiate and sell waste or enter in partnerships	Dispose of faecal sludge
DWS	<p>Development of compulsory national standards relating to the provision of sanitation services</p> <p>Funding of basic sanitation services in the entire sanitation value chain</p> <p>Assessment of Technical Reports, Business Plans, and recommendation of budgets</p> <p>Coordinate initiatives from institutions involved in the development, assessment, validation, certification, and accreditation of sanitation technologies</p> <p>Develop and maintain database for endorsed appropriate sanitation technologies</p>	<p>Development of Guidelines, Advocate, Monitor, Support, and Regulate</p> <p>Develop and maintain database for endorsed appropriate sanitation technologies</p>	<p>Development of Guidelines, Advocate, Monitor, Support, and Regulate</p> <p>Develop and maintain database for endorsed appropriate sanitation technologies</p>	<p>Approval of budgets for grant funding</p> <p>Issuing of Water Use Licenses</p> <p>Development of Guidelines, Advocate, Monitor, Support, and Regulate</p> <p>Develop and maintain database for endorsed appropriate sanitation technologies</p>	<p>Development of Guidelines, Advocate, Monitor, Support, and Regulate</p> <p>Develop and maintain database for endorsed appropriate sanitation technologies</p>	<p>Issuing of Water Use Licenses</p> <p>Development of Guidelines, Advocate, Monitor, Support, and Regulate</p> <p>Develop and maintain database for endorsed appropriate sanitation technologies</p>

Table 2: Roles of enabling FSM stakeholders relative to the sanitation service chain

ENABLING STAKEHOLDERS						
Stakeholder	Containment	Emptying	Transport	Treatment	Re-use	Disposal
COGTA	<p>Oversight and financing of Local Government</p> <p>Provide support and capacity building to WSAs in the planning and provision of sanitation services</p> <p>Ensure WSAs acquire relevant skills for sanitation infrastructure management</p>	<p>Oversight and financing of Local Government</p> <p>Provide support and capacity building to WSAs in the provision of sanitation services</p> <p>Ensure WSAs acquire relevant skills for sanitation infrastructure management</p>	<p>Oversight and financing of Local Government</p> <p>Provide support and capacity building to WSAs in the provision of sanitation services</p> <p>Ensure WSAs acquire relevant skills for sanitation infrastructure management</p>	<p>Oversight and financing of Local Government</p> <p>Provide support and capacity building to WSAs in the provision of sanitation services</p> <p>Ensure WSAs acquire relevant skills for sanitation infrastructure management</p>	<p>Oversight and financing of Local Government</p> <p>Provide support and capacity building to WSAs in the provision of sanitation services</p> <p>Ensure WSAs acquire relevant skills for sanitation infrastructure management</p>	<p>Oversight and financing of Local Government</p> <p>Provide support and capacity building to WSAs in the provision of sanitation services</p> <p>Ensure WSAs acquire relevant skills for sanitation infrastructure management</p>
SALGA	<p>Support to Local Government</p> <p>Advocate for safe management of sanitation</p> <p>Build capacity of WSAs as institutions as well as leadership and technical capacity</p> <p>Support and advise WSAs on safe management of sanitation in the sanitation value chain</p>	<p>Support to Local Government</p> <p>Mobilise and liaise with WSAs in the provision of sanitation and special programmes</p> <p>Advocate for safe management of sanitation</p> <p>Build capacity of WSAs as institutions as well as leadership and technical capacity</p> <p>Support and advise WSAs on safe management of sanitation in the sanitation value chain</p>	<p>Support to Local Government</p> <p>Mobilise and liaise with WSAs in the provision of sanitation and special programmes</p> <p>Advocate for safe management of sanitation</p> <p>Build capacity of WSAs as institutions as well as leadership and technical capacity</p>	<p>Support to Local Government</p> <p>Mobilise and liaise with WSAs in the provision of sanitation and special programmes</p> <p>Advocate for safe management of sanitation</p> <p>Build capacity of WSAs as institutions as well as leadership and technical capacity</p>	<p>Support to Local Government</p> <p>Mobilise and liaise with WSAs in the provision of sanitation and special programmes</p> <p>Advocate for safe management of sanitation</p> <p>Build capacity of WSAs as institutions as well as leadership and technical capacity</p>	<p>Support to Local Government</p> <p>Mobilise and liaise with WSAs in the provision of sanitation and special programmes</p> <p>Advocate for safe management of sanitation</p> <p>Build capacity of WSAs as institutions as well as leadership and technical capacity</p>

ENABLING STAKEHOLDERS						
Stakeholder	Containment	Emptying	Transport	Treatment	Re-use	Disposal
	Serve as the main hub of local government knowledge and intelligence as well as facilitate peer learning within the sector	Serve as the main hub of local government knowledge and intelligence as well as facilitate peer learning within the sector	Support and advise WSAs on safe management of sanitation in the sanitation value chain Serve as the main hub of local government knowledge and intelligence as well as facilitate peer learning within the sector	Support and advise WSAs on safe management of sanitation in the sanitation value chain Serve as the main hub of local government knowledge and intelligence as well as facilitate peer learning within the sector	Support and advise WSAs on safe management of sanitation in the sanitation value chain Serve as the main hub of local government knowledge and intelligence as well as facilitate peer learning within the sector	Support and advise WSAs on safe management of sanitation in the sanitation value chain Serve as the main hub of local government knowledge and intelligence as well as facilitate peer learning within the sector
DFFE	None	None	None	Environmental Impact Assessment – Permission to proceed with new FSTP	None	Environmental Impact Assessment – Permission to proceed with disposal
DoH	Monitoring of public health risks and health promotion	Monitoring of public health risks	Monitoring of public health risks	Monitoring of public health risks	Monitoring of public health risks and health promotion in re-use initiatives	Monitoring of public health risks
DSI	Technology development/ marketing and research support for containment	Technology development/ marketing and research support for emptying	Technology development/ marketing and research support for transporting	Technology development/ marketing and research support for FSTP	Technology development/ marketing and research support for end use and quality management	Technology development/ marketing and research support for impact assessment
WRC	Manage South African Sanitation Technology Enterprise Programme (SASTEP) for the assessment and validating of sanitation technologies for the entire sanitation value chain	Manage South African Sanitation Technology Enterprise (SASTEP) for the assessment and validating of sanitation technologies for the entire sanitation value chain	Manage South African Sanitation Technology Enterprise (SASTEP) for the assessment and validating of sanitation technologies for the entire sanitation value chain	Manage South African Sanitation Technology Enterprise (SASTEP) for the assessment and validating of sanitation technologies for the entire sanitation value chain	Manage South African Sanitation Technology Enterprise (SASTEP) for the assessment and validating of sanitation technologies for the entire sanitation value chain	Research Impact of sanitation services

ENABLING STAKEHOLDERS						
Stakeholder	Containment	Emptying	Transport	Treatment	Re-use	Disposal
	Research and development of new sanitation technologies and solutions Assess sanitation technologies	Research and development of new sanitation technologies and solutions Assess sanitation technologies	Research and development of new sanitation technologies and solutions Assess sanitation technologies	Research and development of new sanitation technologies and solutions Assess sanitation technologies	Research and development of new sanitation technologies and solutions Assess sanitation technologies	
SABS	Develop, maintain, and promote South African National Standards (SANS)	Develop, maintain, and promote SANS	Develop, maintain, and promote SANS	Develop, maintain, and promote SANS	Develop, maintain, and promote SANS	Develop, maintain, and promote SANS
DALRRD	None	None	None	None	Permission to sell and use sanitation on agricultural activities	None
DPW	Ensure that on-site sanitation systems in all public facilities (schools, clinics, bus stops etc.) are built to compulsory national standards					
DHS	New construction of on-site sanitation facilities with RDP houses	None	None	None	None	None
NDoT	None	None	Regulate transportation of faecal sludge in accordance with National Road Traffic Act	None	None	None
Other: e.g., Small Enterprise Development Agencies	Support local businesses to supply improved services for containment technologies Support Small, Micro and Medium Enterprises (SMME) marketing for containment technologies	Support local businesses to supply improved emptying services Support SMMEs to contract with Local Municipalities to supply services	Support local businesses to supply improved transport services Support SMMEs to contract with Local Municipalities to supply transport services	Support local businesses to supply operations services for FSTPs Support SMMEs to contract with Local Municipalities to supply operations services for FSTP	Support local businesses to establish re-use services / methods Support SMMEs to contract with Local Municipalities to supply re-use services	None

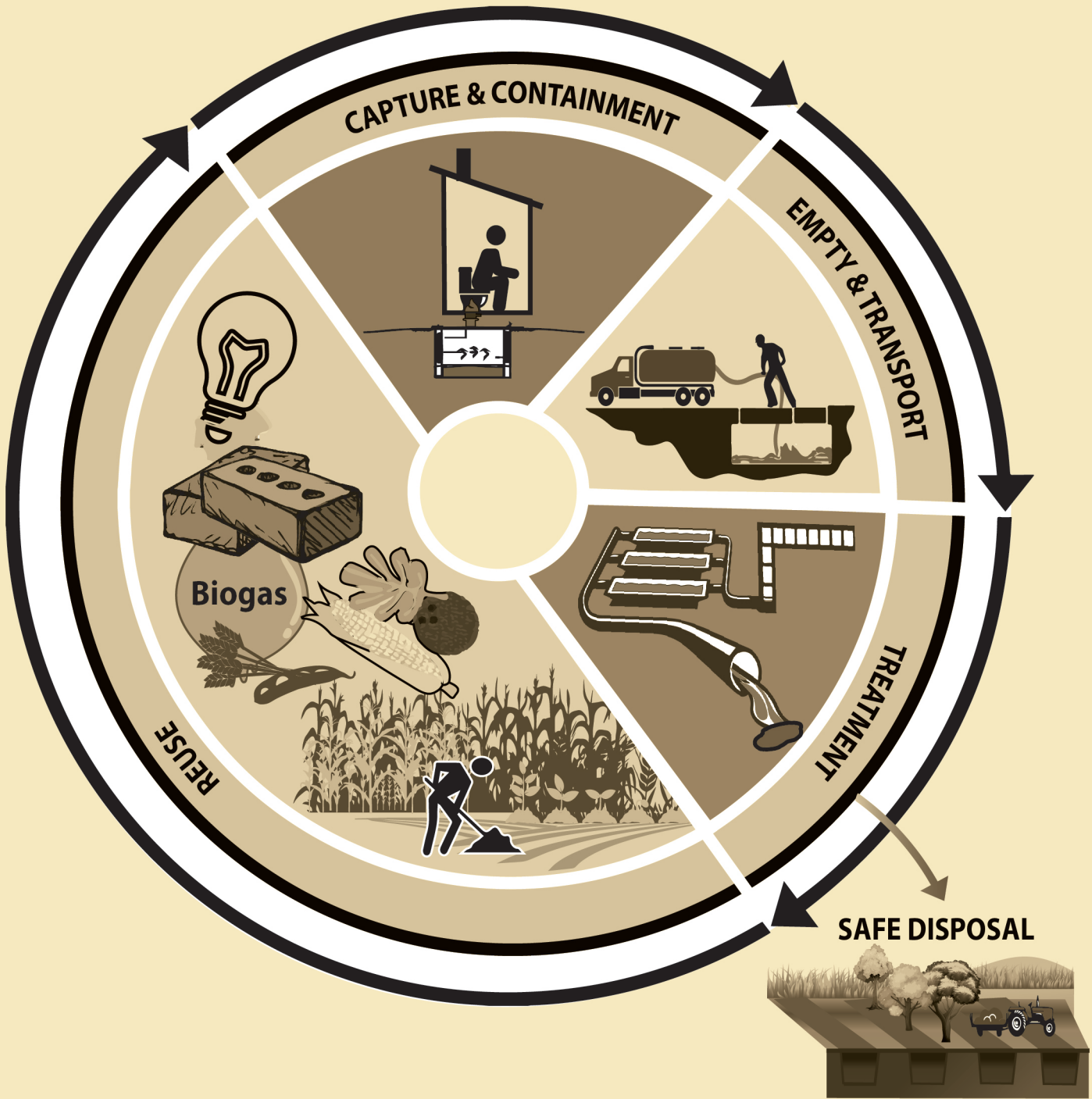
ENABLING STAKEHOLDERS						
Stakeholder	Containment	Emptying	Transport	Treatment	Re-use	Disposal
NHBRC	Ensure that builders comply with standards for FSM containment systems	None	None	None	None	None

National FSM Strategy

Annexure 3: Index of supporting documents

No	Document title	Description
1	Status quo of Faecal Sludge Management in South Africa	<p>This document introduces the faecal sludge management service chain (which the strategy is designed to address). The Status Quo Assessment comprises the following sections:</p> <ul style="list-style-type: none"> Regulatory and institutional frameworks for FSM in South Africa FSM Service Delivery and technologies FSM Financing <p>Based on these assessments, findings and recommendations were set out for integration into the FSM Strategy</p> <p>https://www.dws.gov.za/Documents/1_FSM%20Status%20Quo_15-06-2021.pdf</p>
2	Polokwane Local Municipality Case Study Consolidated Report	<p>This document comprises a summary of findings from the implementation of sanitation assessment tools and the urban resilience assessment carried out in the Polokwane Local Municipality. The following assessments were undertaken:</p> <ul style="list-style-type: none"> • Climate Resilient Sanitation Safety Plan • Faecal Waste Flow Diagram (SFD) • City Service Delivery Assessment (CSDA) • Wastewater systems assessment • FSM treatment and reuse options analysis • Urban Resilience Assessment <p>The results were consolidated into the National Faecal Sludge Management Strategy.</p> <p>https://www.dws.gov.za/Documents/2_Polokwane%20Consolidated%20report_21-02-2022.pdf</p>
3	FSM Conceptual Framework	<p>This document sets out the issues to be addressed by the FSM strategy and the overall goals the strategy is designed to achieve. In addition, the concepts of FSM, a legislative overview, the platform for FSM in South Africa and examples of FSM in practice in South Africa and globally. The key areas of enquiry – which are now the pillars of the strategy – are explained.</p> <p>https://www.dws.gov.za/Documents/3_FSM%20Conceptual%20Framework24-03-2021.pdf</p>





LAYOUT AND DESIGN BY THE DEPARTMENT OF WATER AND SANITATION
COMMUNICATION SERVICES