

# Shit Flow Diagrams

## What is the benefit to me?

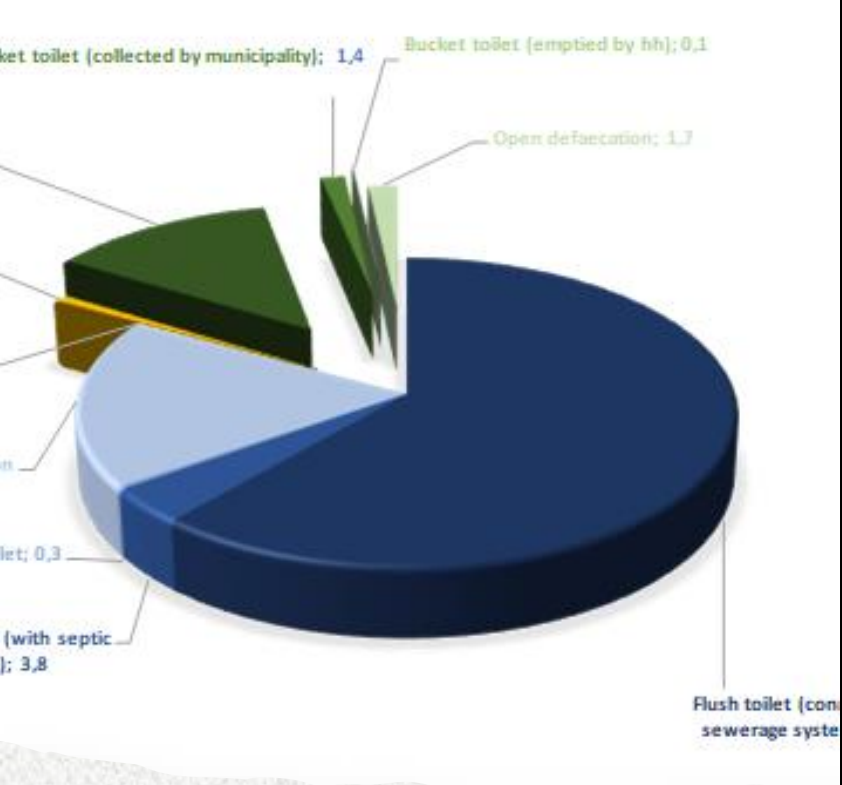
## What is the benefit to sector?

Dr S Pillay

Water Research Commission

[sudhirp@wrc.org.za](mailto:sudhirp@wrc.org.za)

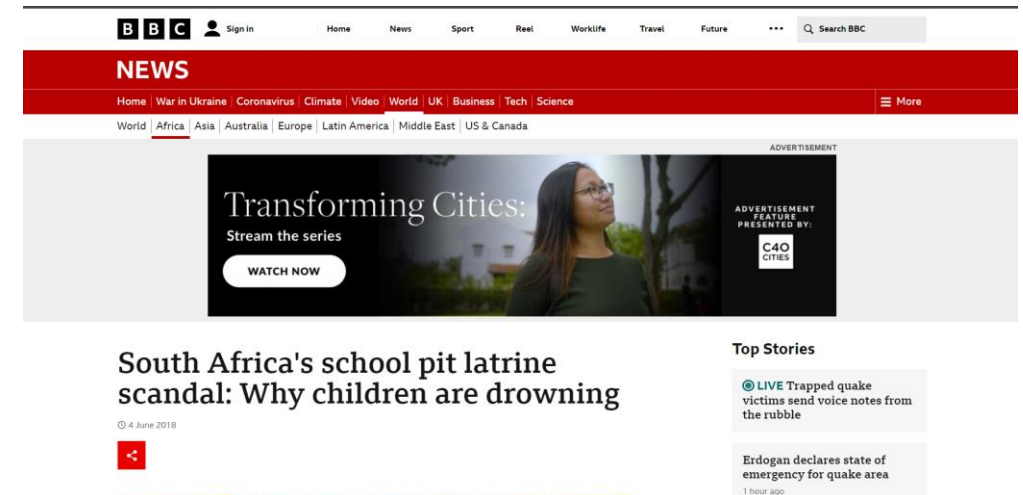




Municipalities can have different types of toilets

# How do we manage different technologies?

- Green Drop: Incentive-based regulation approach
- Green Drop: awarded to wastewater systems that obtain scores of 90% against criteria set for wastewater management
- **Non-sewered sanitation not on radar but can make significant percentage of the budget** (primary and secondary backlogs in IDPs)
- Non-sewered risk failures is bad news.
- Shit Flow Diagrams – easy visualization of where priority is required



The screenshot shows the BBC News website interface. At the top, there is a navigation bar with the BBC logo, a sign-in button, and links for Home, News, Sport, Reel, Worklife, Travel, and Future. A search bar is located on the right. Below the navigation bar is a red banner with the word "NEWS" in white. Underneath the banner, there are links for Home, War in Ukraine, Coronavirus, Climate, Video, World, UK, Business, Tech, and Science. A secondary navigation bar lists regional categories: World, Africa, Asia, Australia, Europe, Latin America, Middle East, and US & Canada. The main content area features a large video advertisement for "Transforming Cities" with a "WATCH NOW" button. Below the advertisement is a featured article titled "South Africa's school pit latrine scandal: Why children are drowning" with a date of 4 June 2019. To the right of the article is a "Top Stories" section with two items: "LIVE Trapped quake victims send voice notes from the rubble" and "Erdogan declares state of emergency for quake area" (1 hour ago).

# How will this help me? What do I get?

- Good data is good decision making
- Helps convey technical knowledge to non-technical people through use of visual aid – not technocratic
- Predictive – help understand where and why priority is needed
- Assists with infrastructure audits and accountability
- Able to use as KPI – show service delivery and approved by council
- Universities offer valuable insight

# What would it require from me?

- You get what you put in
- First order estimation can be done using municipal data & Stats SA
  - Municipalities often reconcile data that does not match Stats SA data
  - Municipal surveys undertaken
- From this, highlight where there are data gaps and improvements in data reporting / merging required at various municipal levels
- An action plan can be developed based on a SFD

# Benefit to me (and sector)?



Good data = good planning



Understanding & communicating where budget needs to be prioritized for sanitation services



KPI monitoring for intervention

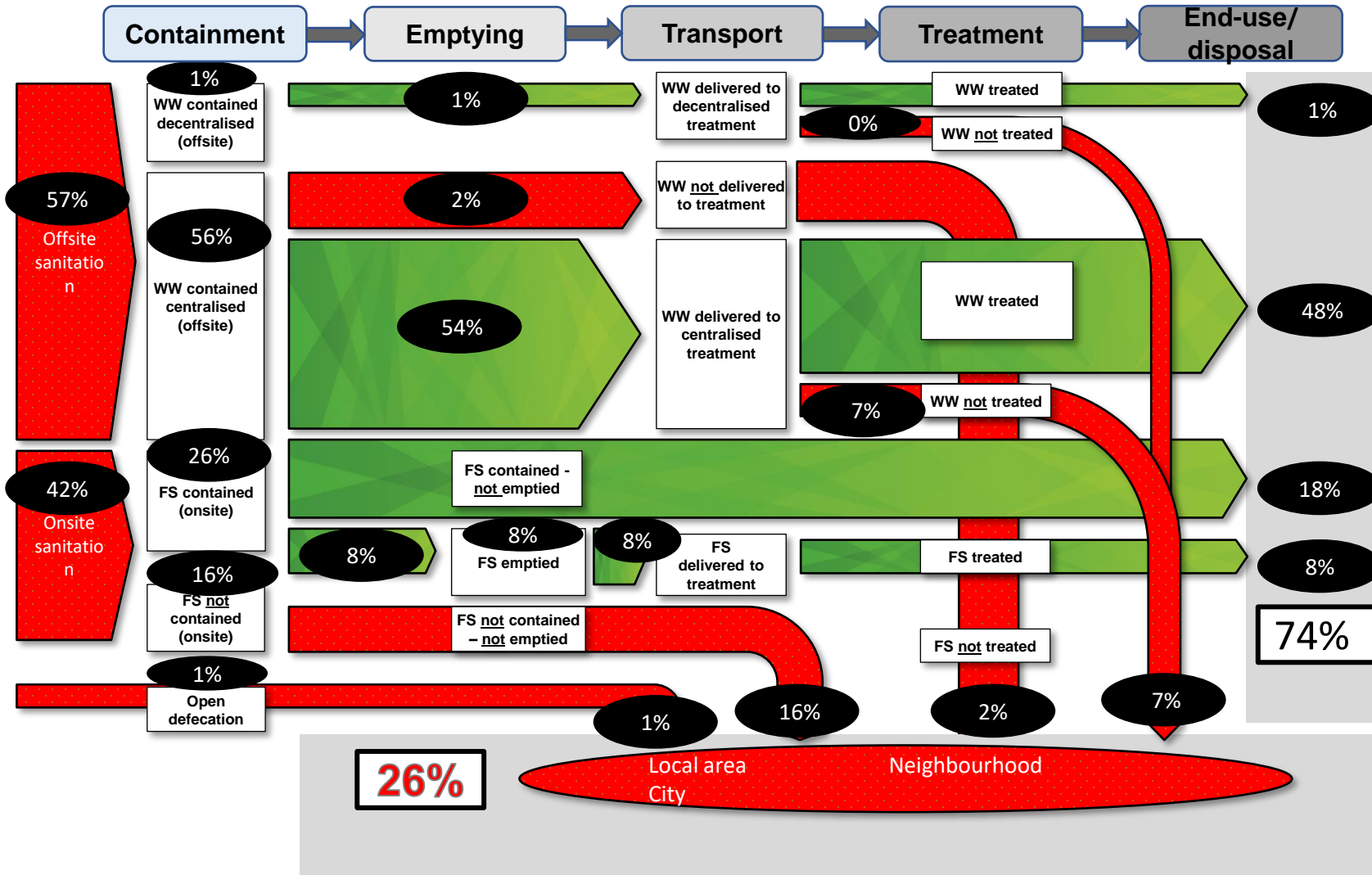


Capacity for data capture and analysis by universities



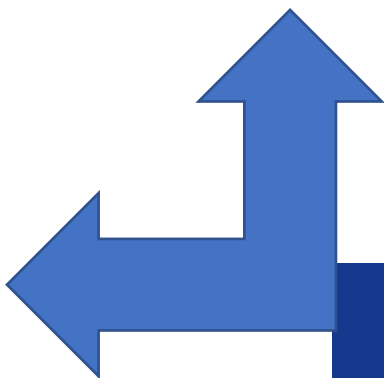
Functional management tool for the future

# First SFD – eThekweni 2016



Public sanitation services

Private sanitation services



2016



Master's internship





# Public Sector Services



- **Informal Settlement sanitation**

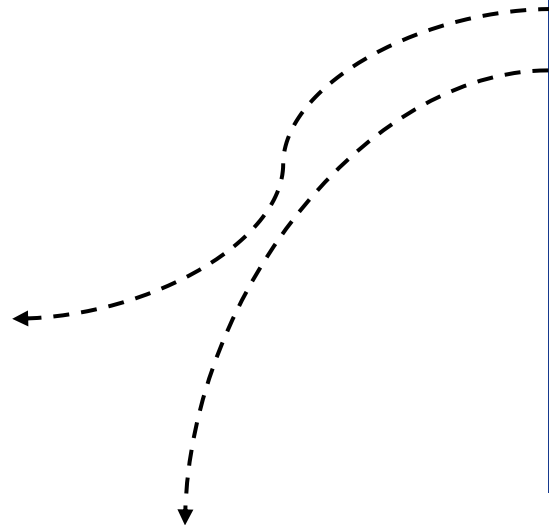
- **WWTWs**

- **Formalized Residential & industrial sanitation**

- **Pump stations and transportation**

# Private Sector Services

- **Septic Tank collection & transportation**



- **Decentralized WWTWs: Package Plants**





## Interviews with various departments



# Informal and formalized Systems Information

- MANY TOILET TYPES: but all accounted for

- Onsite

- UD toilets

- to Black Soldier Fly treatment
      - contents buried on site

- VIP toilets - limited

- Ablution block onsite

- Septic Tank flush toilets

- Conservancy tanks flush toilets

- Offsite

- Flush toilets to central sewer network

- Ablution block to central sewer

- Decentralized package plants





# WWT Works

- Lots of information on VOLUME!
- Manage the Sea port - regulated
  - Area of debate at the end of the SFD



# Pumps and Sewer Network

- Only data on pump failures was reported incidents
- Very rough estimate on percentage of waste lost







**Interview and demonstration**

# Septic tank services

- Many private companies- but all should have relationship with Municipality
- Union groups were main contact
- Interconnected to the Decentralized Package Plants





# Decentralized Package Plants

- Not a large focus - relatively small impact to city
- Area with differing views





# Geo-Survey via Aerial picture

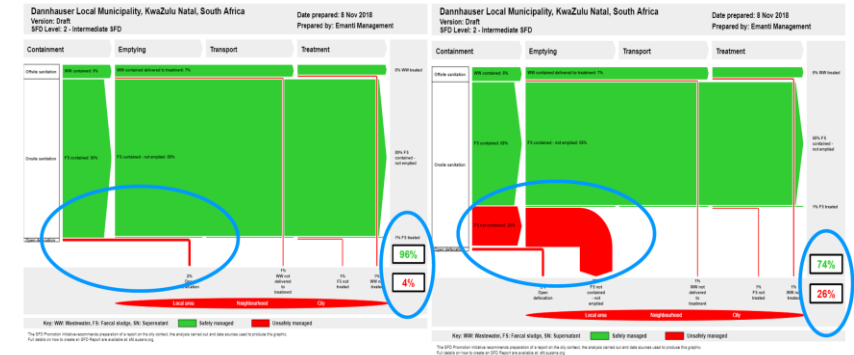


Counting toilet structures



# We did a few more after

- Eight SFD reports developed
- No municipality is 100% seweraged
- Interactions have confirmed that >50 % of pits and/or tanks are not emptied
- SFDs highlighted gaps and areas of concern related to the sanitation chain
- Innovation: Forecast modelling (see figure)
- **Need for Remedial Action Plans – SFDs only point problem – need for solutions / action plans around SFDs**

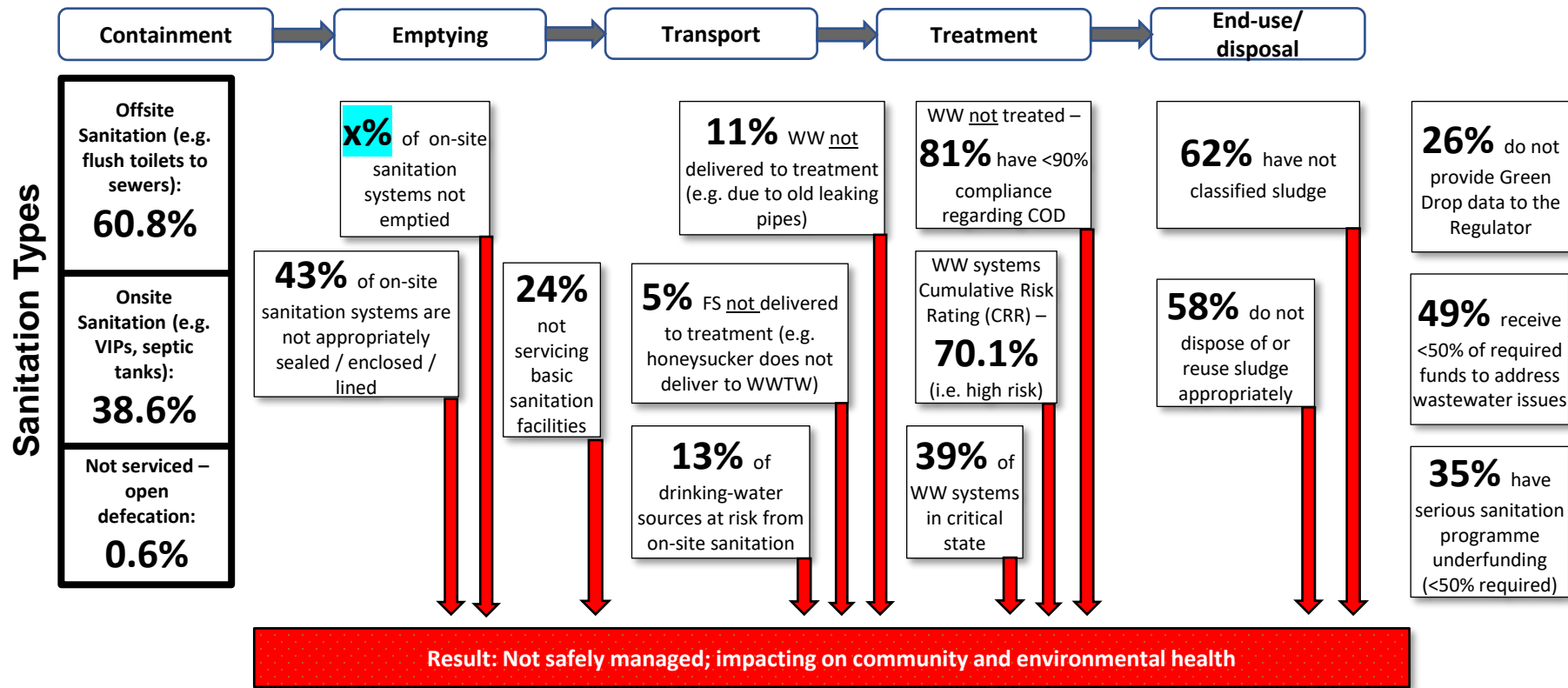




# What are the contributors to poor sanitation performance?

## Estimated average status of the 144 WSAs in South Africa – 1<sup>st</sup> Order Shit Flow Diagram

### Sanitation Value Chain



# Lessons in doing SFDs

- Develop a benchmark for data entry into SFD model
  - What are our minimum standards – example VIP
  - What is our WSA / municipal standards / by-laws – e.g. eThekweni does not build VIPs, other municipalities have high water table and do not build leaching technologies
  - Include as part of selection
- The first order is a start – we can build upon good foundation
- Universities offer data interpretation / analysis – officials often don't have time to dig into data

# Acknowledgements

- DWS
- eThekwini
- Xanthe Cross & WITS
- Emanti Management
- CSE India
- GiZ