Shit Flow Diagrams

What is the benefit to me?

What is the benefit to the sector?

Dr S Pillay

Water Research Commission

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
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
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

Image from: https://scarabwater.com/index.php/about
Geo-Survey via Aerial picture

Counting toilet structures

Image from: https://unequalscenes.com/durban-metro
We did a few more after

• Eight SFD reports developed
• No municipality is 100% sewerined
• 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 – 1st Order Shit Flow Diagram

Sanitation Value Chain

Result: Not safely managed; impacting on community and environmental health
• 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. eThekwini 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
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