

Balancing adaptation, emissions and public health in sanitation services

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Sanitation is a foundation of public health

- But may be a source of public health problems
 - Flooded and overflowing latrines and tanks
 - Sewer overflows
 - Wastewater treatment failures
 - Broken sewers
- Many problems caused by climate/weather events



Resilience is critical

- Sanitation crucial to community-level resilience
- But highly vulnerable to climate threats (SCARE data identifies deficits across all domains – flooding a particular threat and supply chains are weak)
- Resilience ≠ sustainability

Resilience is the ability of the system to cope climate hazards, trends, & disturbances, responding in ways to maintain its function and the capacity to adapt, learn & transform

Resilience is multi-dimensional

SCARE measures resilience across the FSM chain taking into account:

- Environment
- Infrastructure
- Management & finance
- Governance & accountability
- Institutional support & regulation
- Supply chains (economics and infrastructure)

Data mix of quantitative & qualitative; sanitary risk assessment; GIS

New metric(s) being developed across the FSM chain

Data in 3 countries shows action:

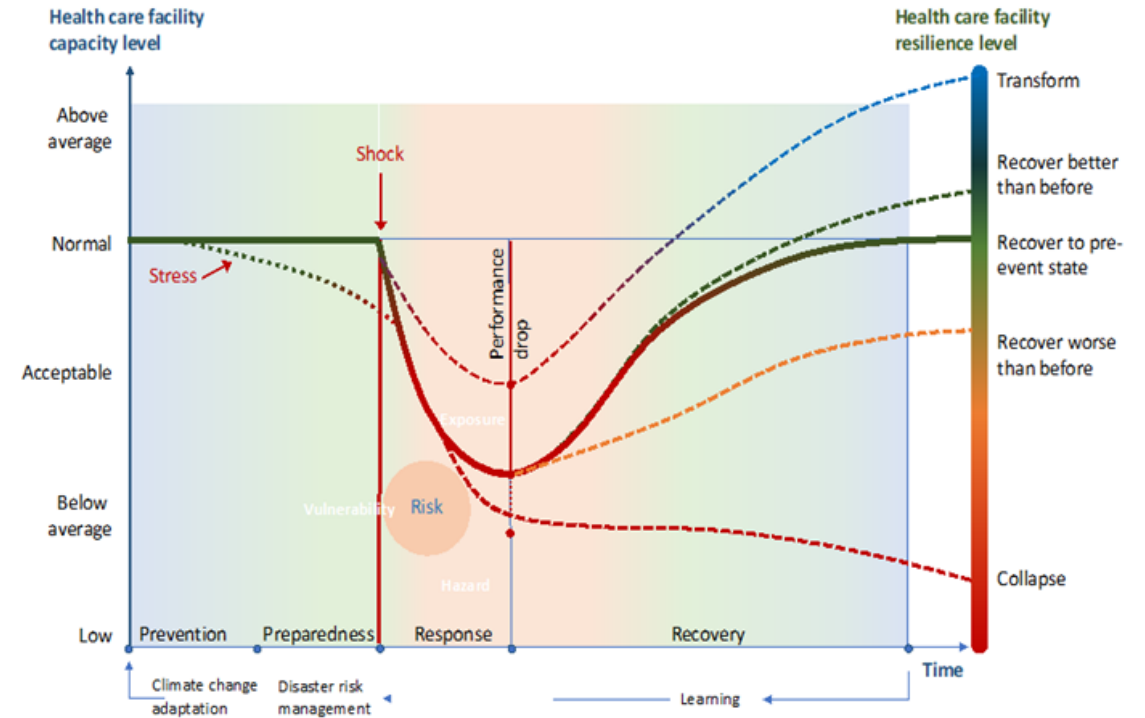
in all areas is critical

supporting infrastructure critical for FSM

Operational management often more important than new technology

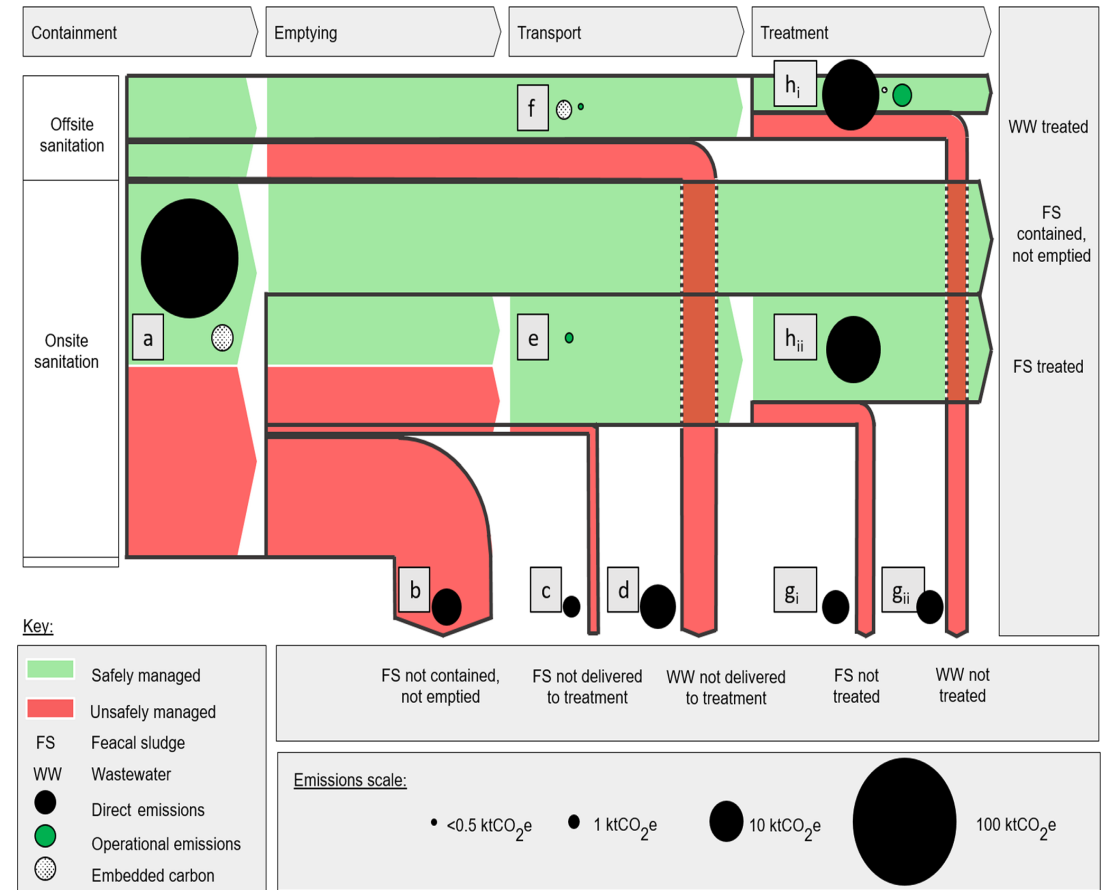
The ability to adapt and learn is central

- Resilient sanitation may not always protect public health
- Need emergency response as part of sanitation planning when extreme events expected
- Need not understand what we are being resilient to: SCARE developing climate storylines (extreme 2-day rainfall increases in all countries)



Sanitation as a source of GHG

- 2010 – 1.6% total global emissions from wastewater (IPCC 2014)
- Onsite sanitation – up to 5% total anthropogenic methane emissions (Cheng et al 2022)
- Kampala – half of total GHG emissions from sanitation (Johnson et al 2022)



Actions on GHG – think about public health

Actions

Data from SCARE indicates

- Reduced size of containments & more frequent emptying to reduce methane
- May be more resilient in some cases but in others will reduce resilience

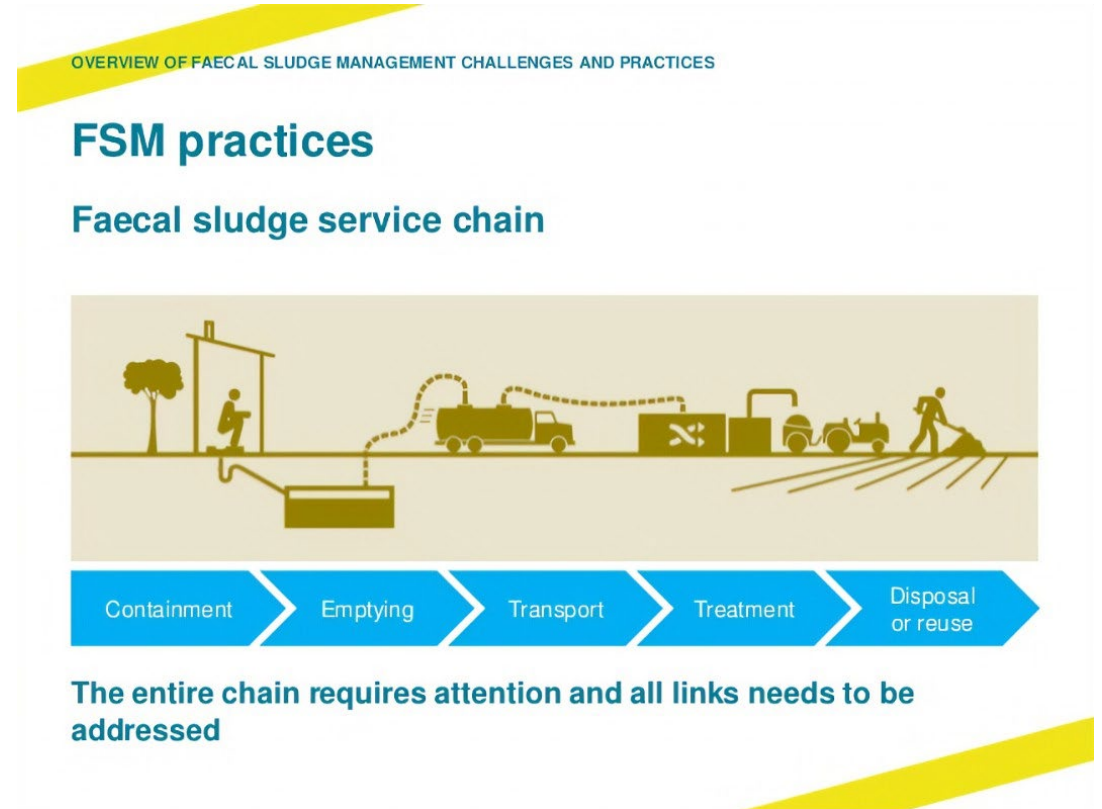
May have consequences...

- Increased occupational health and safety risks
- SCARE environment data show in some places increased risks as shallow containments may be vulnerable to pluvial floods

Scheduling emptying prior to wet season critical, but may need early warning systems for extreme events

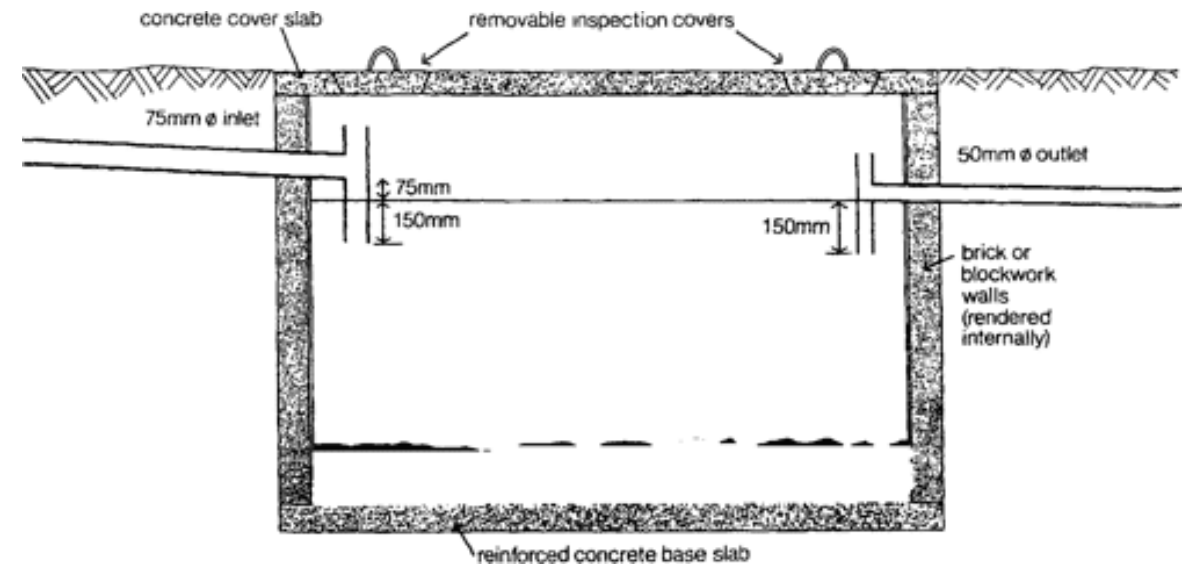
Ensure resilient faecal sludge management chains

- Need investment in supporting infrastructure and financing to make resilient – e.g. Nepal FSTP poorly linked with emptying services
- Can offer benefits on GHGs - methane capture at WWTP
- Centralised is effective but not at community/household level



Using sewerage to reduce emissions

- Sewerage (e.g., in Kampala) may help reduce anaerobic conditions - rapid movement
- Resilience may demand modified sewers
- Need wider investment in drainage to prevent sewer inundation and WWTP overload



The need to professionalise sanitation

- Operational planning and delivery will improve resilience & reduce emissions if done properly
- Evidence from SCARE indicates limited professionalisation (e.g. sanitation officers in Nepal have multiple roles)
- Develop emergency response planning as part of the sanitation system to respond to short-term interruption



Seven key principles to consider

- Integrate public health, resilience & emissions in planning
- Assess current resilience to identify trends and priorities
- Resilience does not mean 'never fail' so plan for emergencies
- Storylines to better characterise climate threats
- Assess inequalities – who is most at risk and why
- Recognise some GHG emissions will be inevitable
- Focus on managing existing services better

For more information on the SCARE project

Contact: Guy Howard, University of Bristol
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<https://resilientwash.blogs.bristol.ac.uk/research-areas/home/sanitation-and-climate-assessing-resilience-and-emissions/>

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