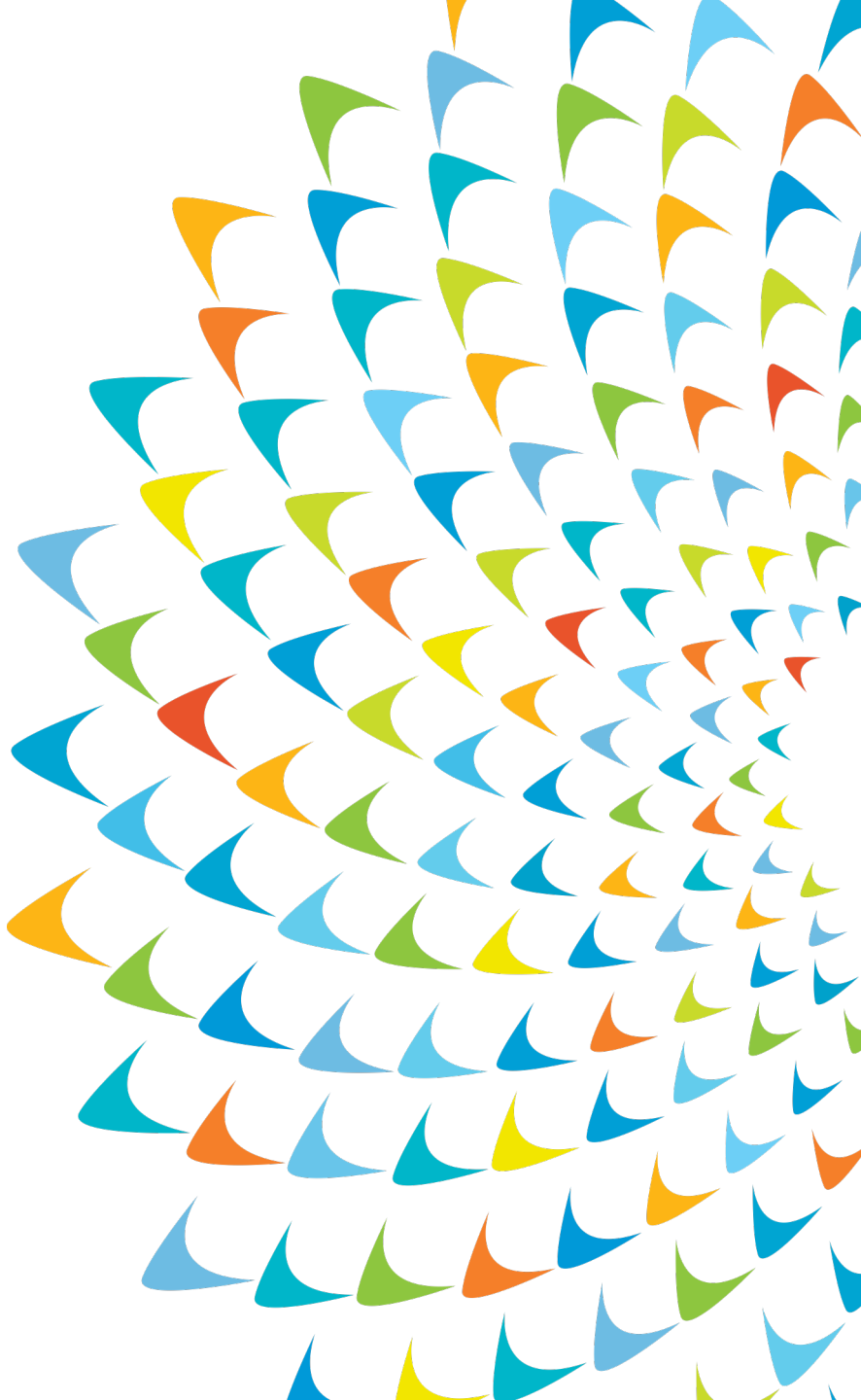
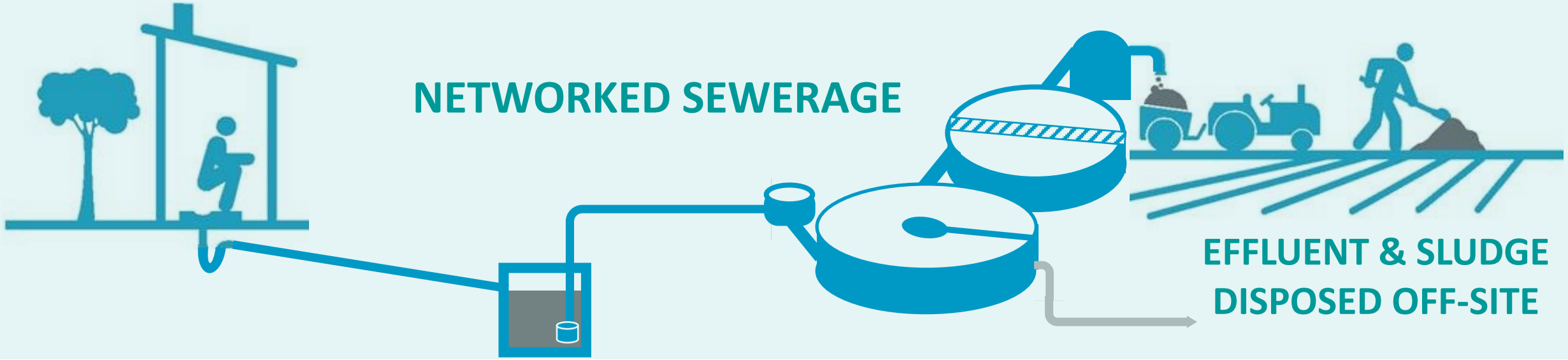
Faecal Flow Diagrams Explained

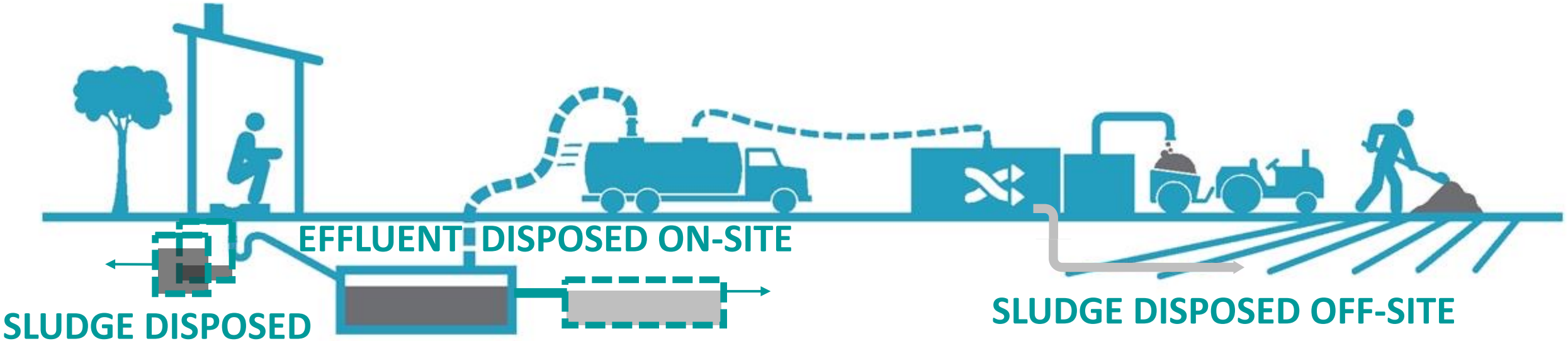
Mark Ellery





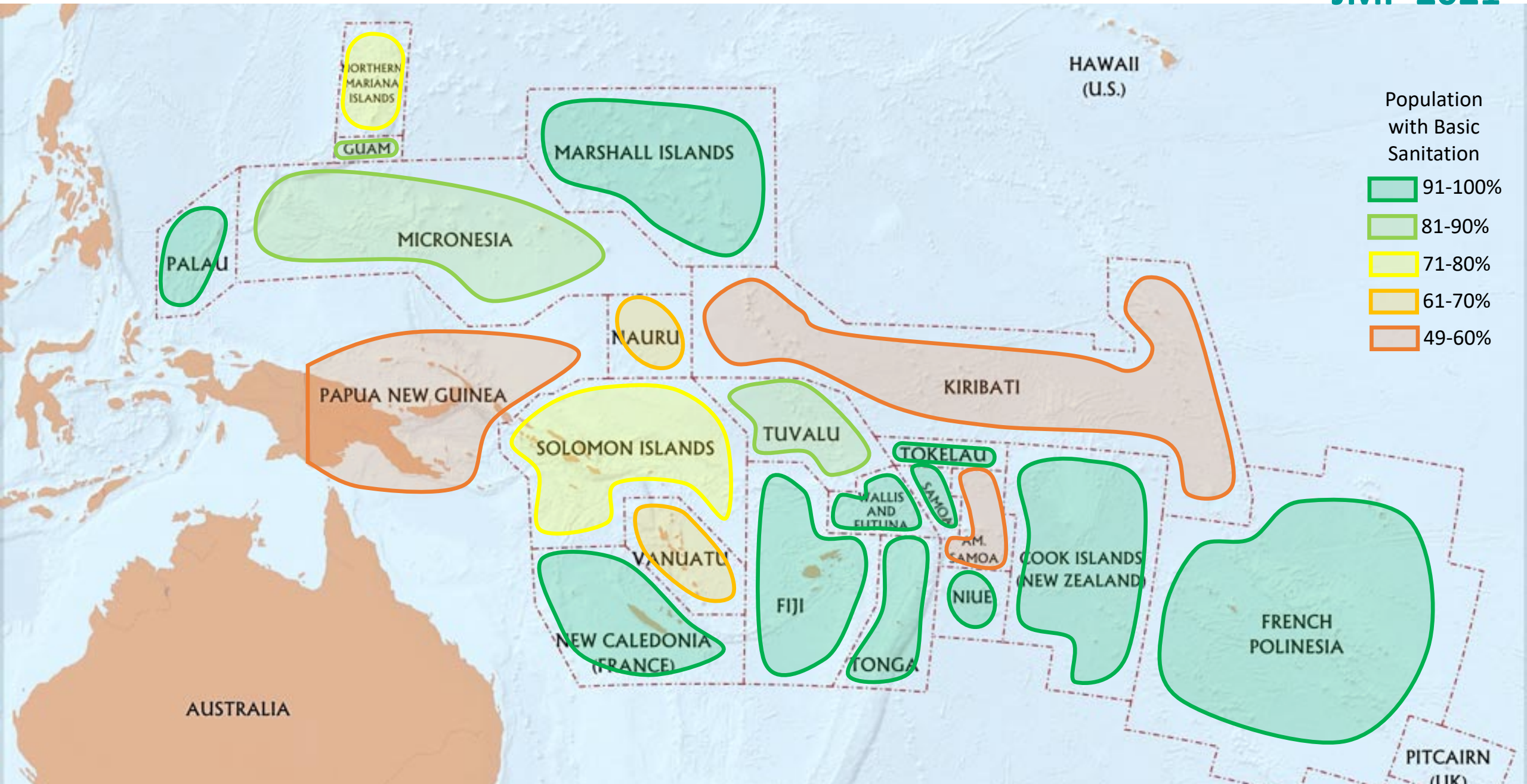
Faecal Flow Diagrams (An assessment & diagnostic tool)

ON-SITE SANITATION

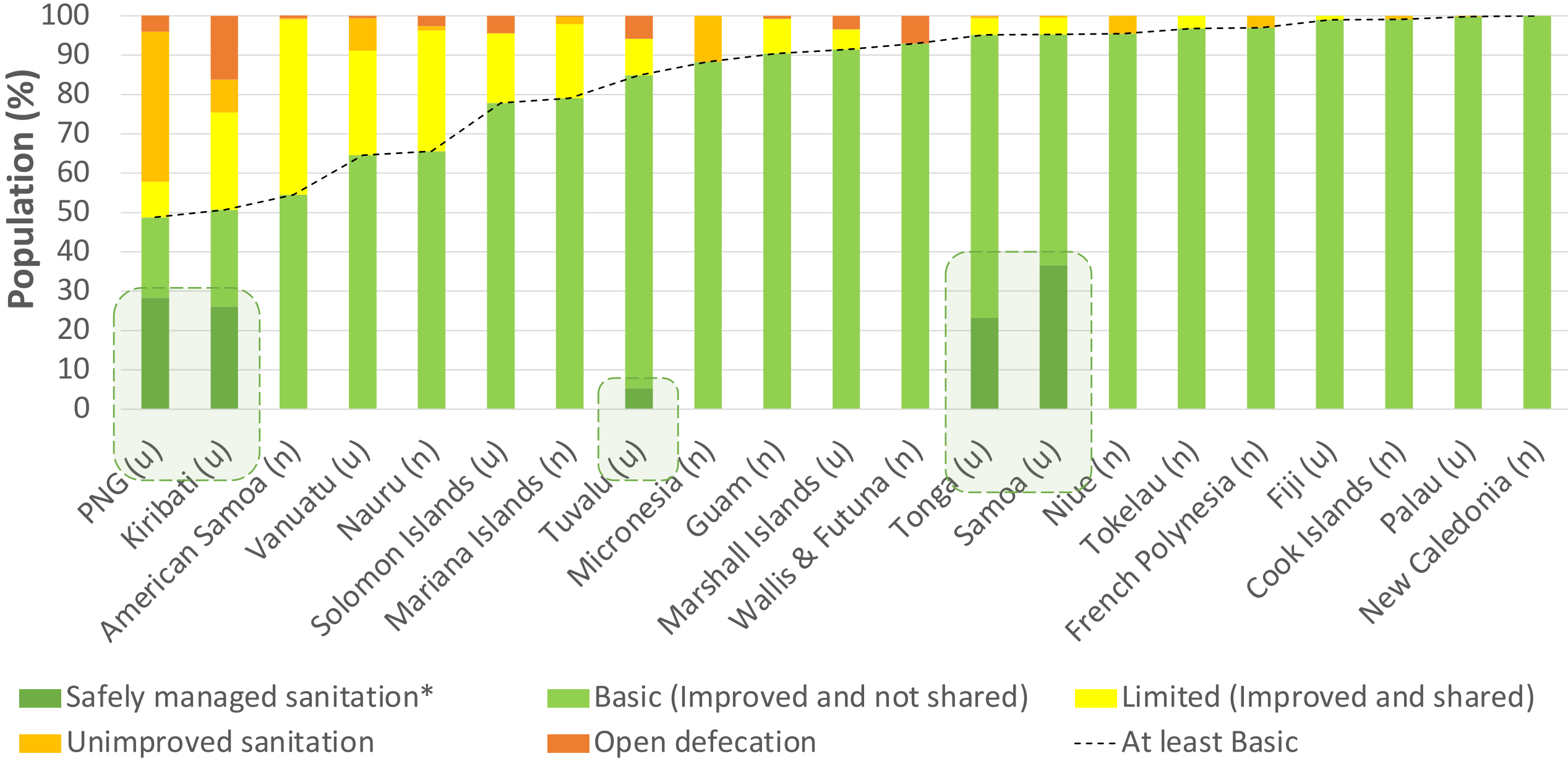


COLLECTION ➤ CONTAINMENT ➤ EMPTYING ➤ TRANSPORT ➤ TREATMENT ➤ REUSE/DISPOSAL

Access to at least Basic Urban Sanitation Facilities JMP 2021



Pacific Access to Basic Urban Sanitation Facilities JMP 2021



* Data not available

(u) Urban data available

(n) Only national data available

SDG Sanitation Ladder

SDG Definitions

No service (open defecation)
Disposal of human faeces in fields, forest, bushes, open bodies of water, beaches or other open spaces or with solid waste

Unimproved Service
Use of pit latrines without a slab or platform, hanging latrines and bucket latrines

Limited Service
Use of improved facilities shared between two or more households

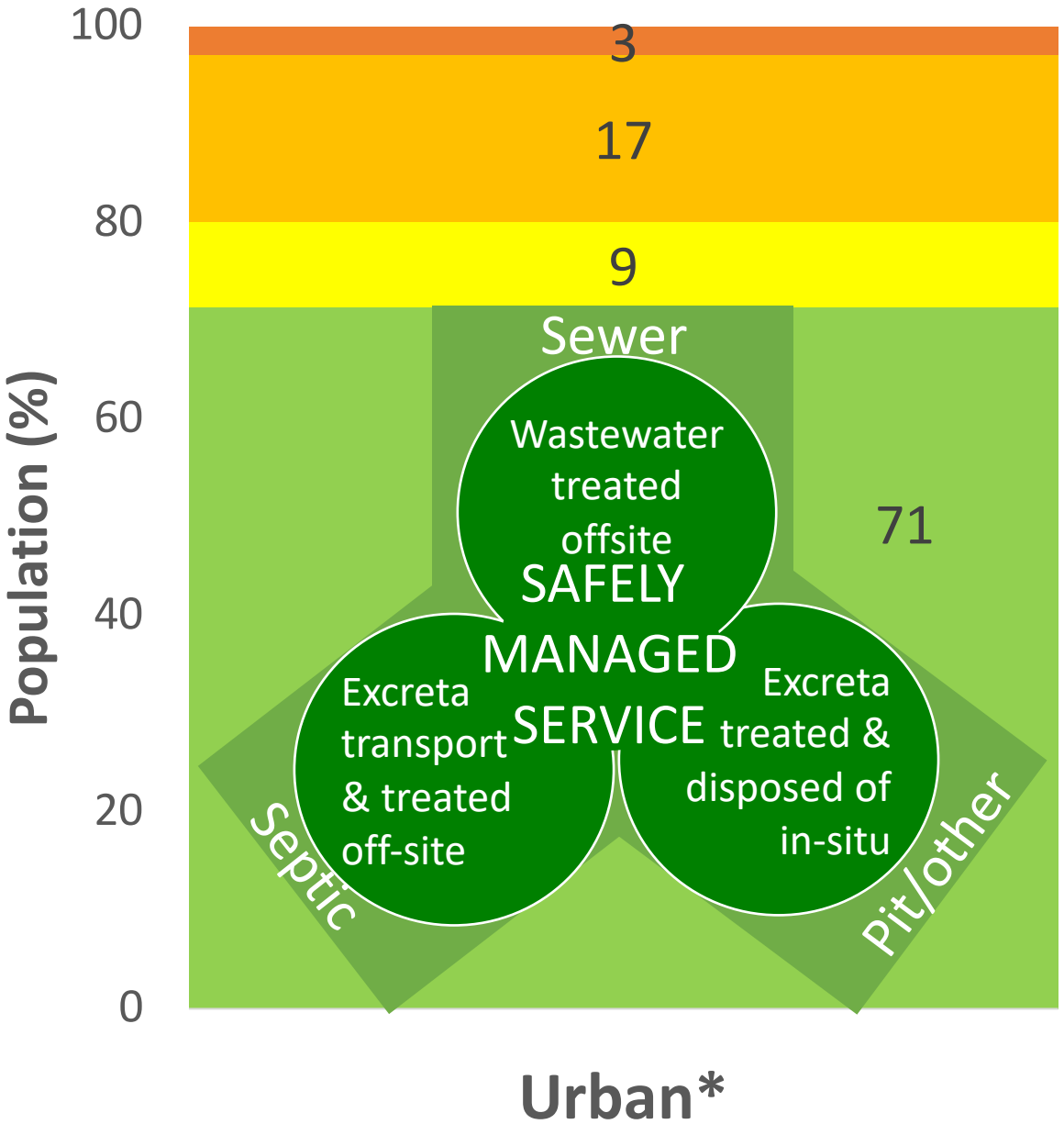
Basic Service
Use of improved facilities which are not shared with other households

Safely managed
Use of improved facilities which are not shared with other households and where excreta are safely disposed in situ or transported and treated off-site

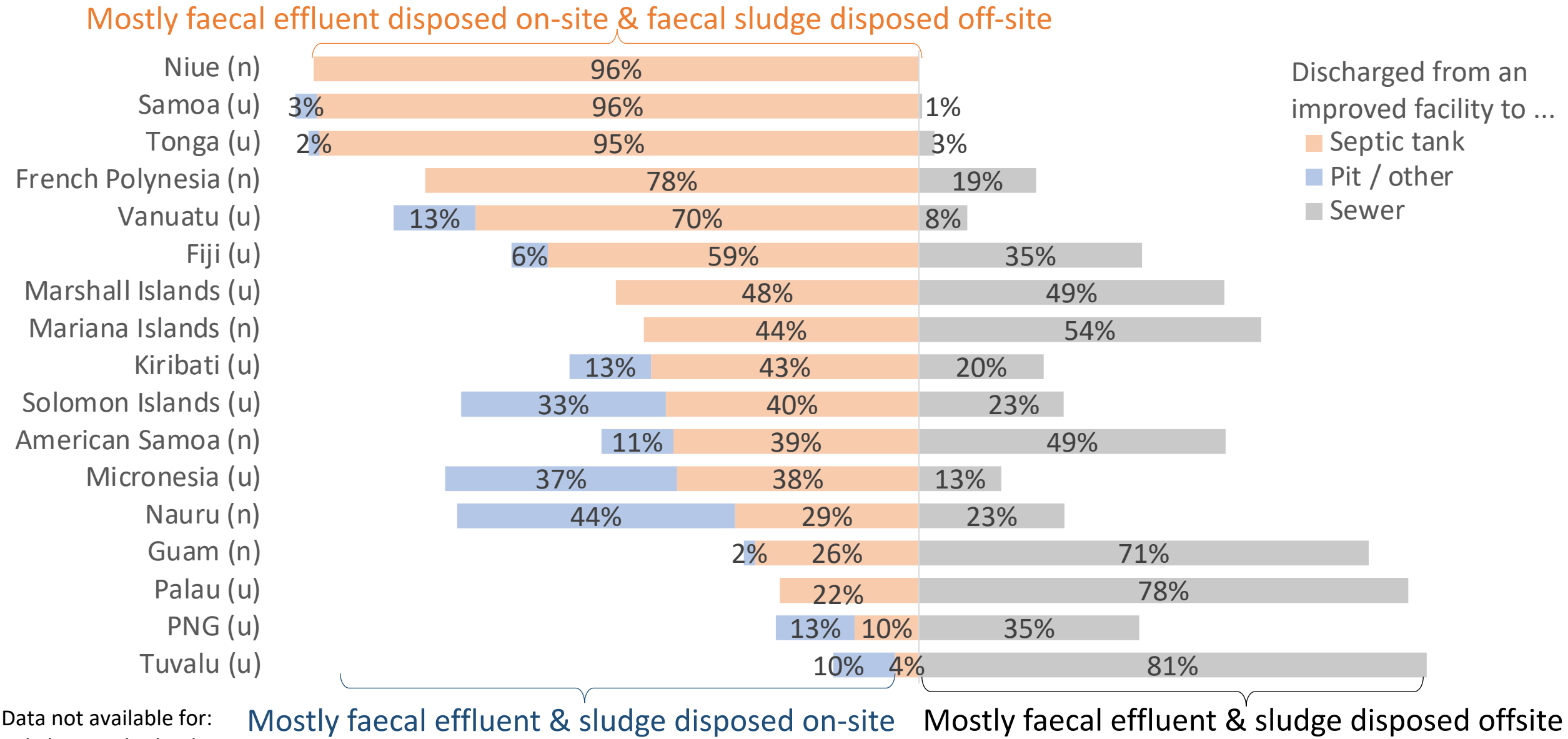
*No safely managed estimate available

Source: WHO/UNICEF JMP (2021)

Pacific Urban Sanitation Status 2020



Faecal Sludge Management vs Sewerage Treatment in the Pacific 2020



Data not available for: Tokelau, Cook Islands, New Caledonia, Wallis & Futuna

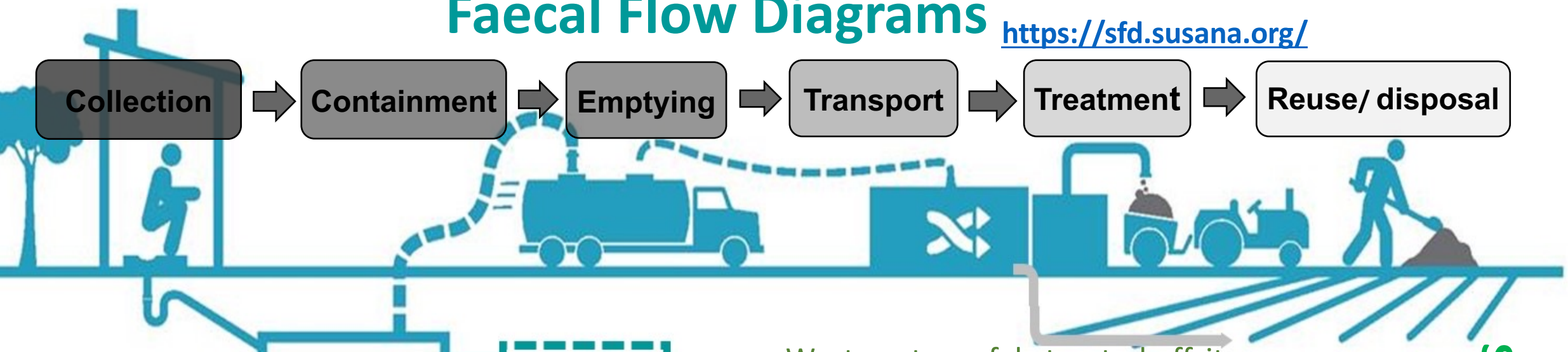
(u) Urban data available

(n) Only national data available

Population (%)

Source: WHO/UNICEF JMP (2021)

Faecal Flow Diagrams https://sfd.susana.org/



Basic

Limited

Unimproved

No service

Sewerage

Septic Tanks

Pits / other

Wastewater safely treated offsite

Excreta safely transported & treated off-site

Excreta safely treated & disposed of in-situ

Local Health Risks

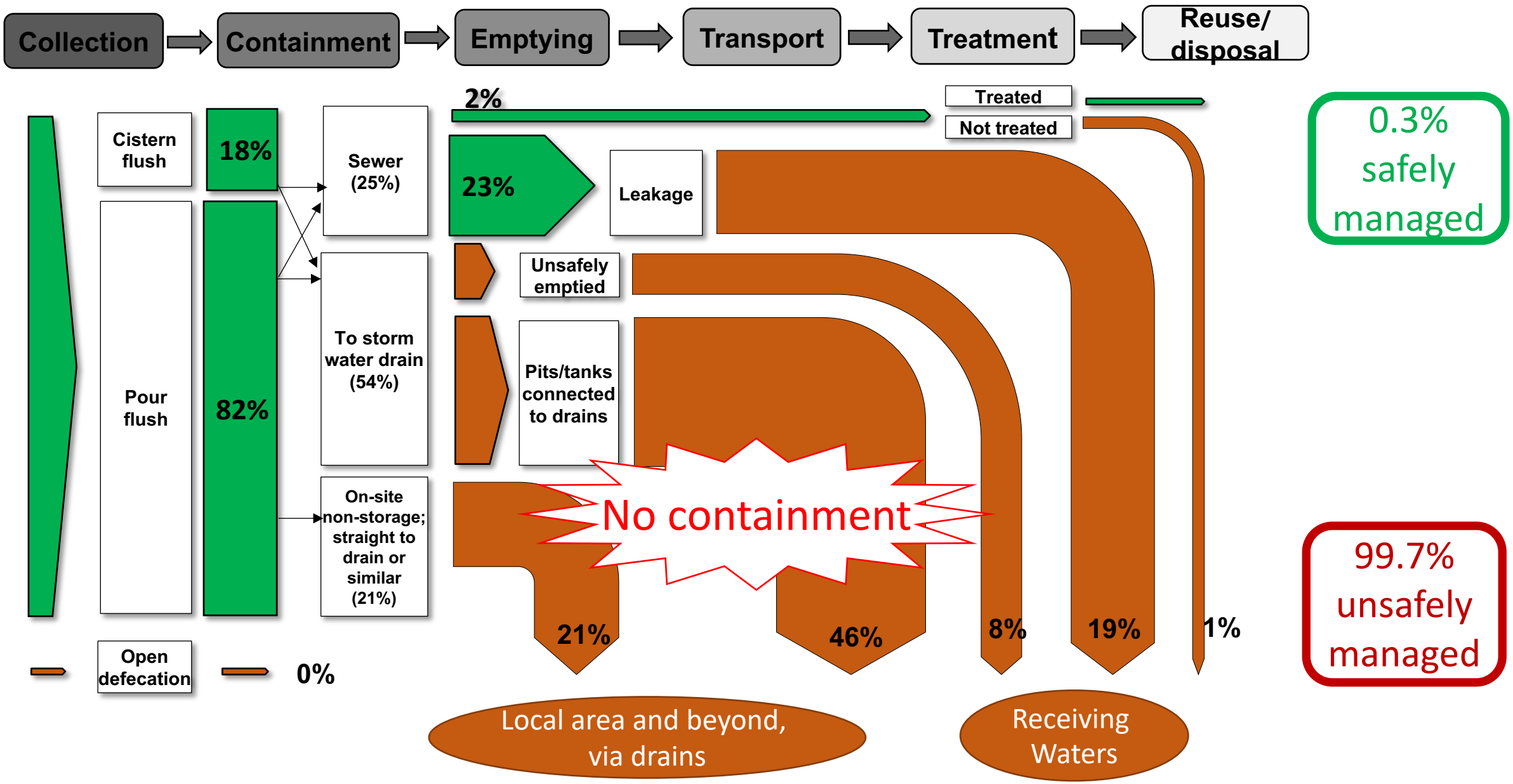
Public Health Risks

Environmental Health Risks

Unsafely Managed Sanitation

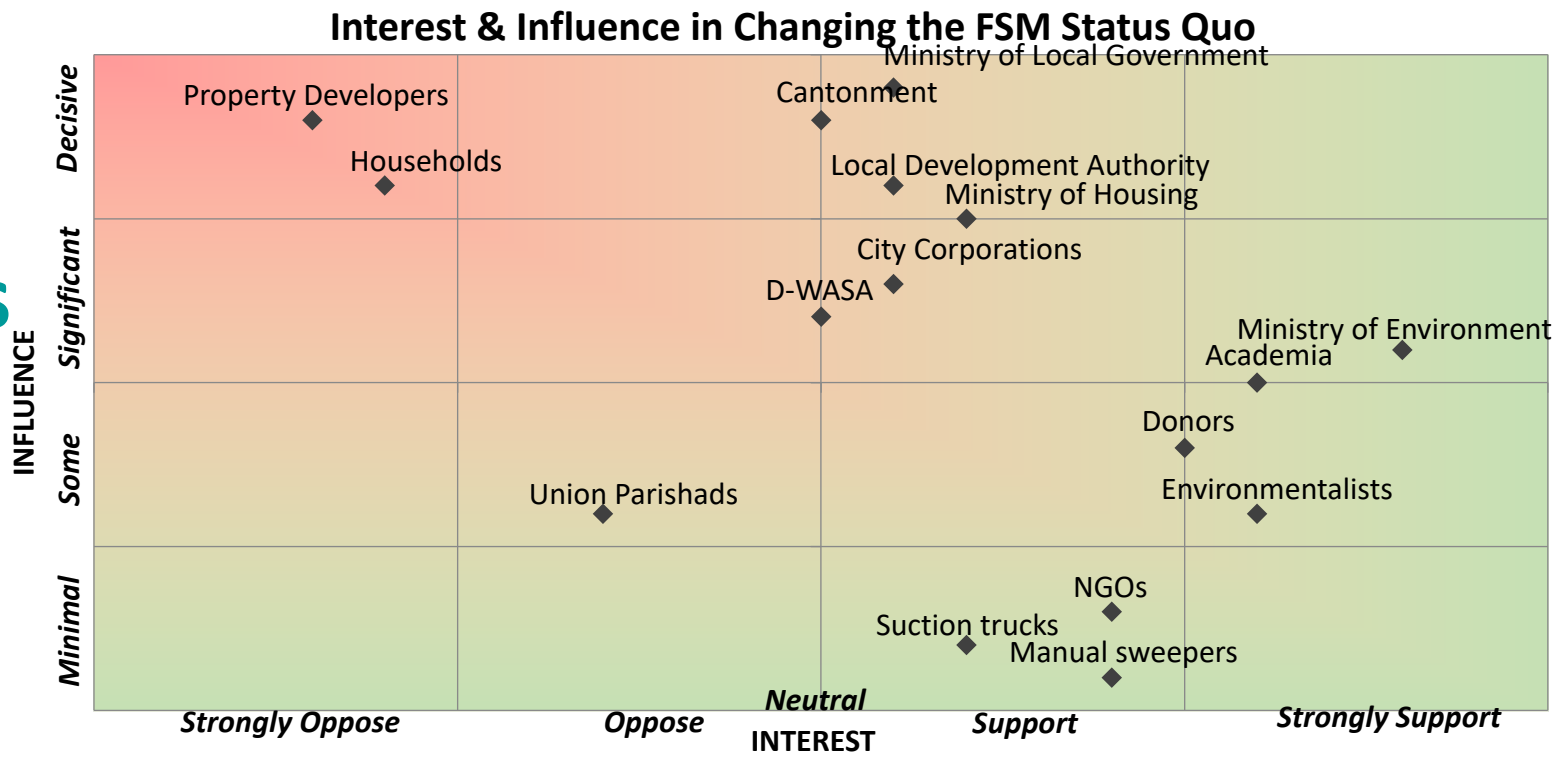
Safely Managed Sanitation

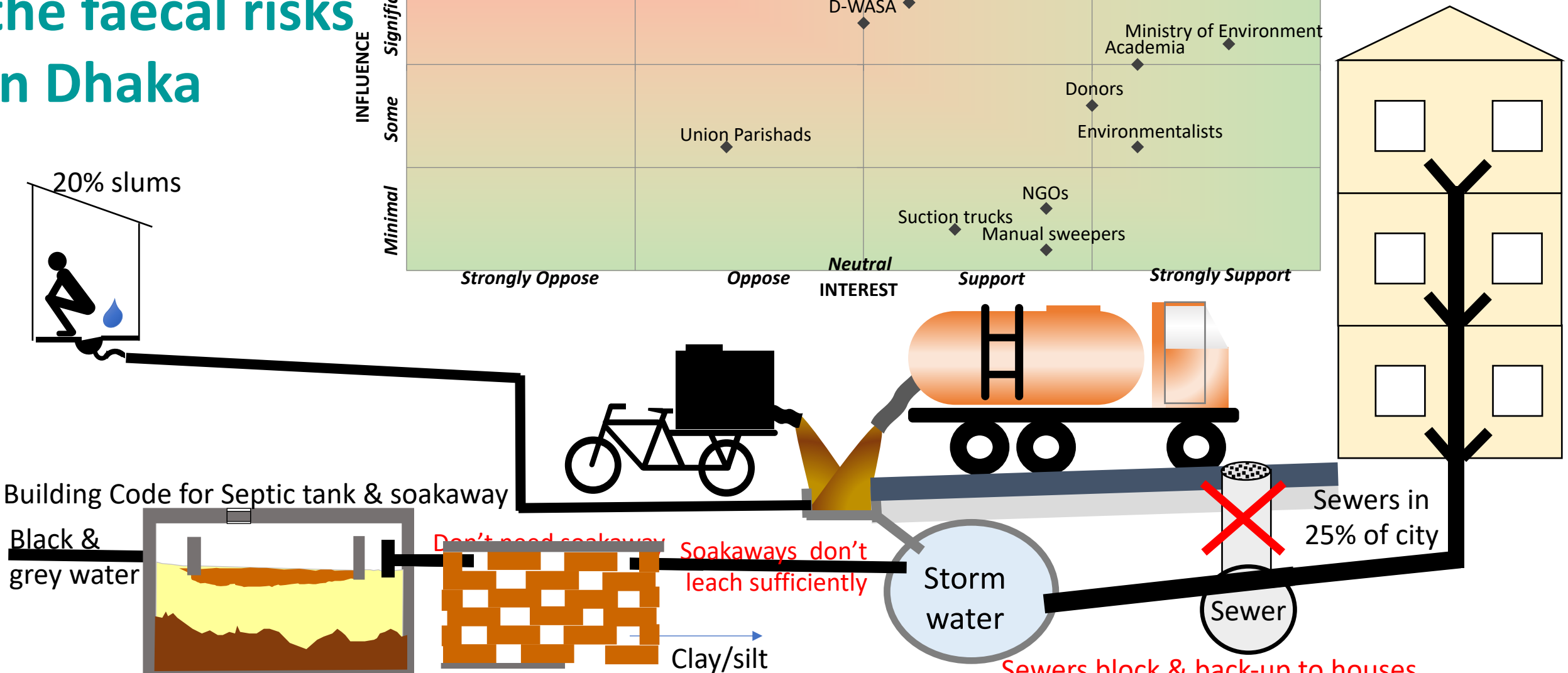
Faecal Flow Diagram (Dhaka, Bangladesh) 9 million people



http://documents.worldbank.org/curated/en/577961468343135688/pdf/106809-REVISED-05b-FSM-Diagnostics-Urban-Case-Study-Dhaka.pdf

Stormwater drains carry all the faecal risks in Dhaka

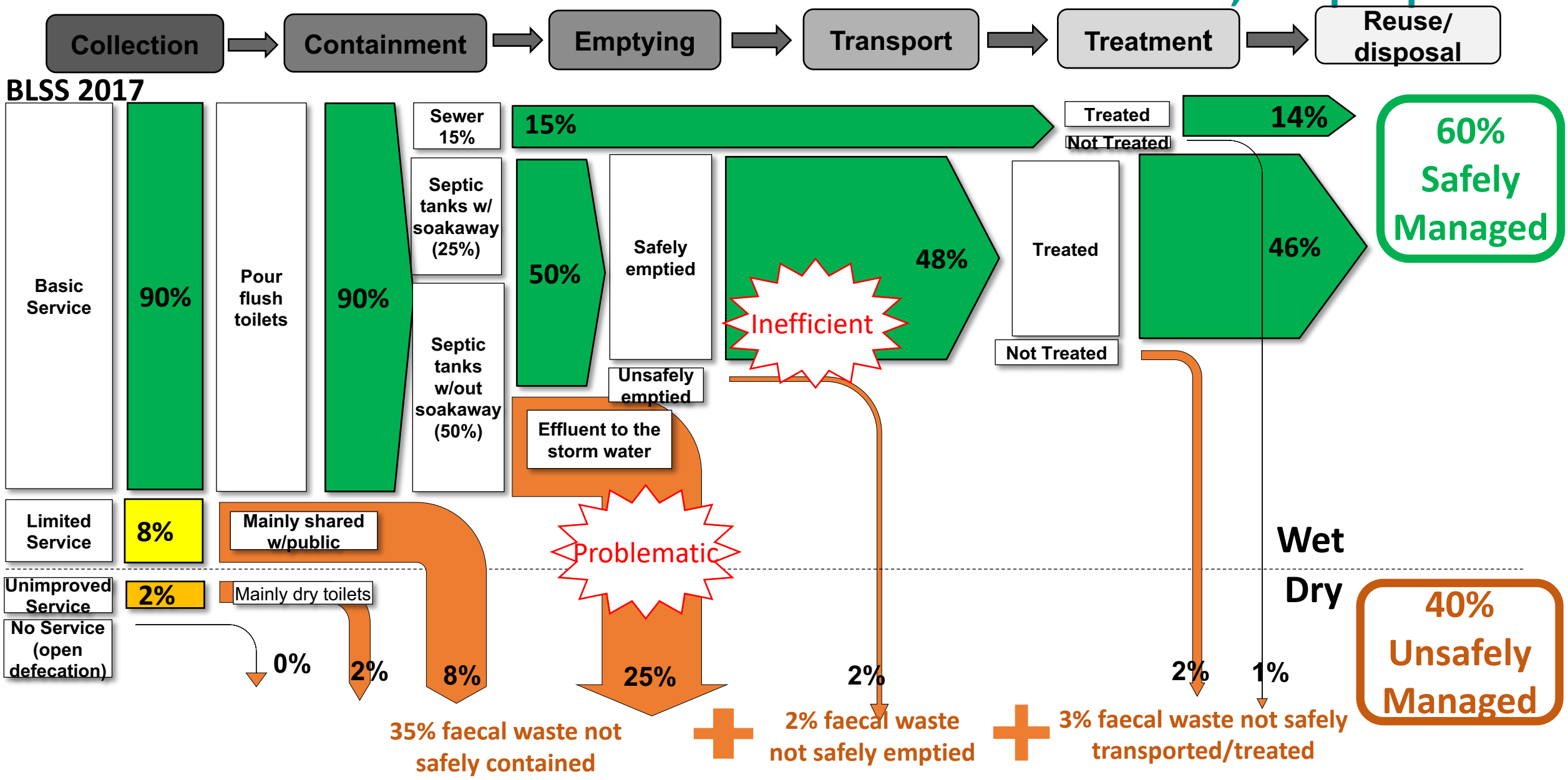




Can stormwater be treated at the outfalls?

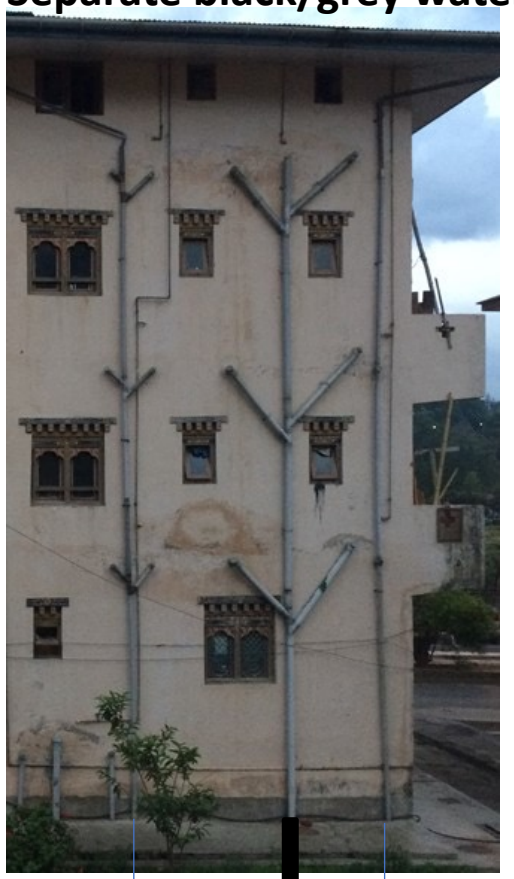
Urban Bhutan Faecal Flow Diagram

300,000 people



Tankers primarily transport effluent (blackwater) in Thimphu

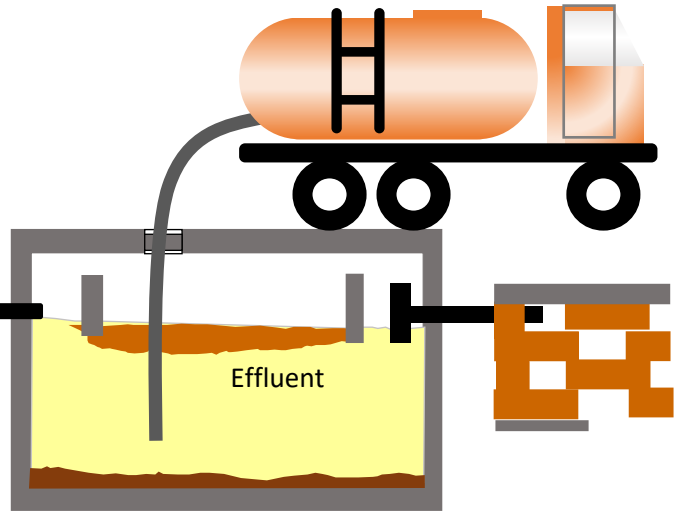
Separate black/grey water

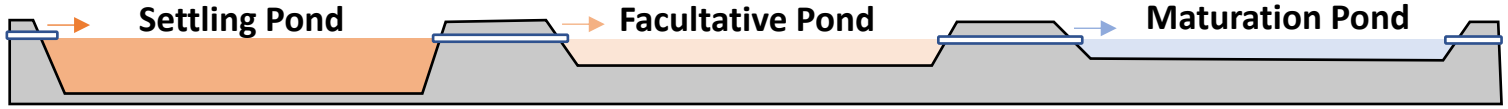


Greywater to open drain

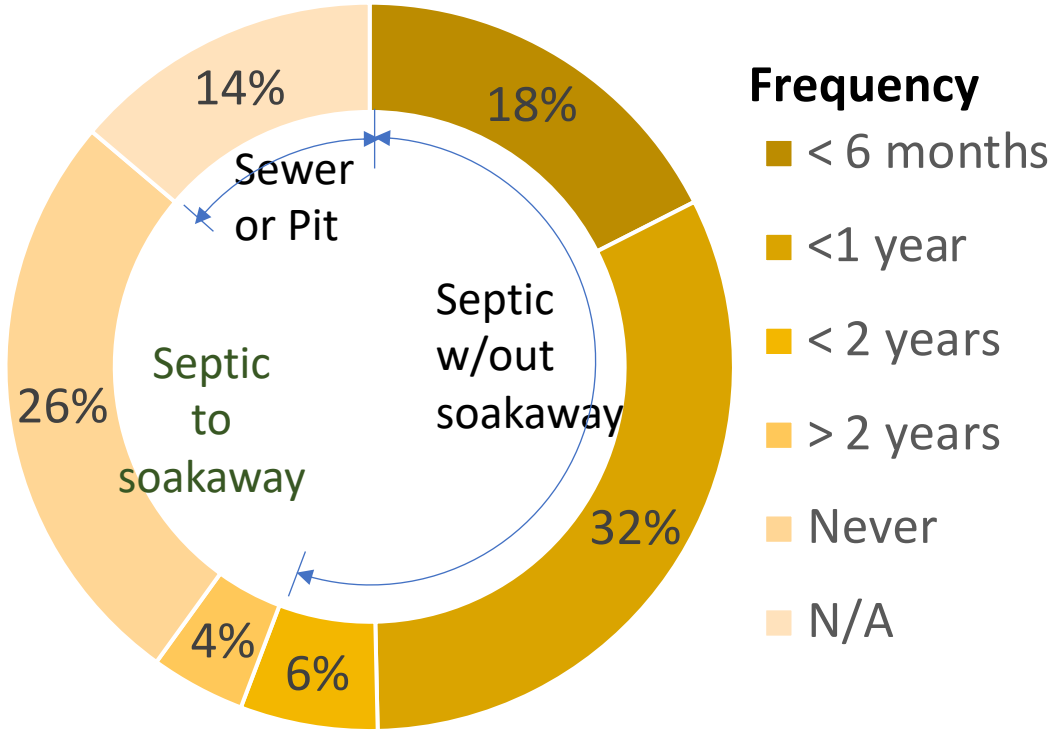
Rainwater to open drain

Blackwater to ~~septic tank~~ holding tank



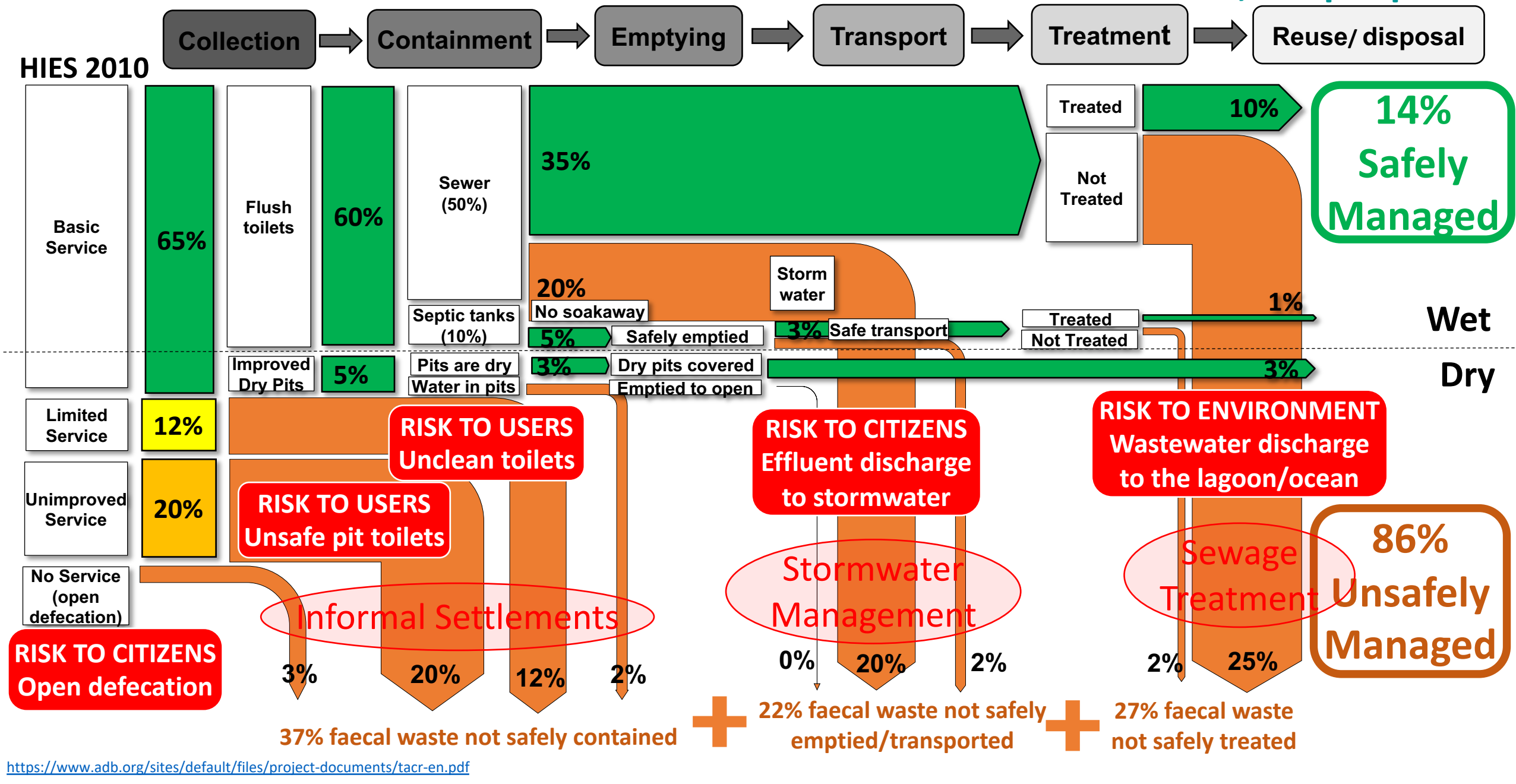


- **High #Septic Tanks:** Less than 14% of HHs connected to sewers
- **High Emptying Rate:** >70% of HHs with septic tanks have been emptied
- **High Frequency:** Over 50% of HH's empty at least once every year
- **Low Fees:** Households receive 4 free empties with their water connection
- **HIGH COST:** Tankers are carting effluent (i.e. water) NOT sludge



Retrofitting soakaways could dramatically improve the safety and efficiency of faecal effluent

Faecal Flow Diagram (Port Moresby, PNG) 500,000 people



https://www.adb.org/sites/default/files/project-documents/tacr-en.pdf

Sewers, septics & pit toilets fail to manage wastewater

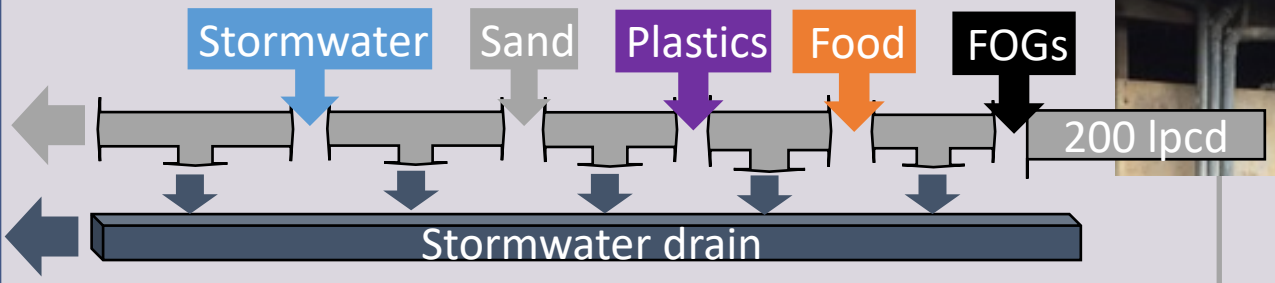
50% Sewers

5% to the Coastal System (to ocean outfall)

JICA (AUSD 100 million upgrade on 9 PS & 1 WWTP)

45% to the Inland System (built 1960's)

Gravity to the waste stabilization ponds (high losses)



Poor efficiency of WWTPs

To soakaways

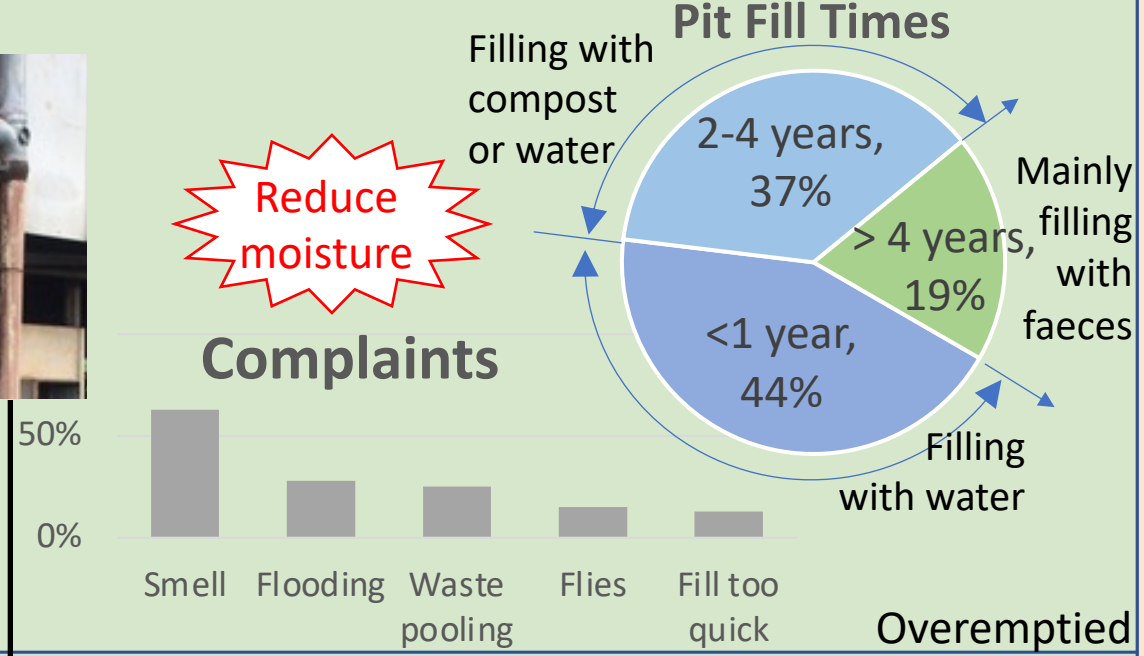
Grey Water (150-175 lpcd)

Separate grey & black water

47% On-site Sanitation

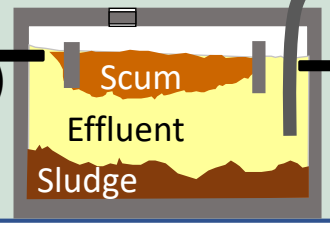
3 %

37% to Pit Toilets (informal settlements)



10% to Septic Tanks

Black & grey water (200 lpcd)



Overemptied <30%

Dense soil

>70% Never emptied

Black Water (25-50 lpcd)

To old gravity sewers
To septic & soakaway