

CSE SFD Week

Designing and Implementing Affordable and Sustainable Citywide Sanitation for All

Anil Agarwal Environment Training Institute (AAETI), Neemli, 2-5 April 2019

The Last 100 Metres: Safeguarding drinking water provisioning
in urban informal settlements

Lessons from Dhaka and Dar es Salaam

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Project in Funder's website [here](#):



Framing the L100M

- Slums/informal settlement and the urban poor
- Drinking water provisioning prioritised over faecal sludge and sewage removal
- Faecal contamination of potable water pathways in a critical zone around the home.....the last 100m

What is the L100M phenomenon?

Increasingly, municipal water is delivered to slum communities via community standpipe

But, unserved by sewerage systems, slum-dwellers rely on toilets draining into poorly constructed pits or septic tanks.

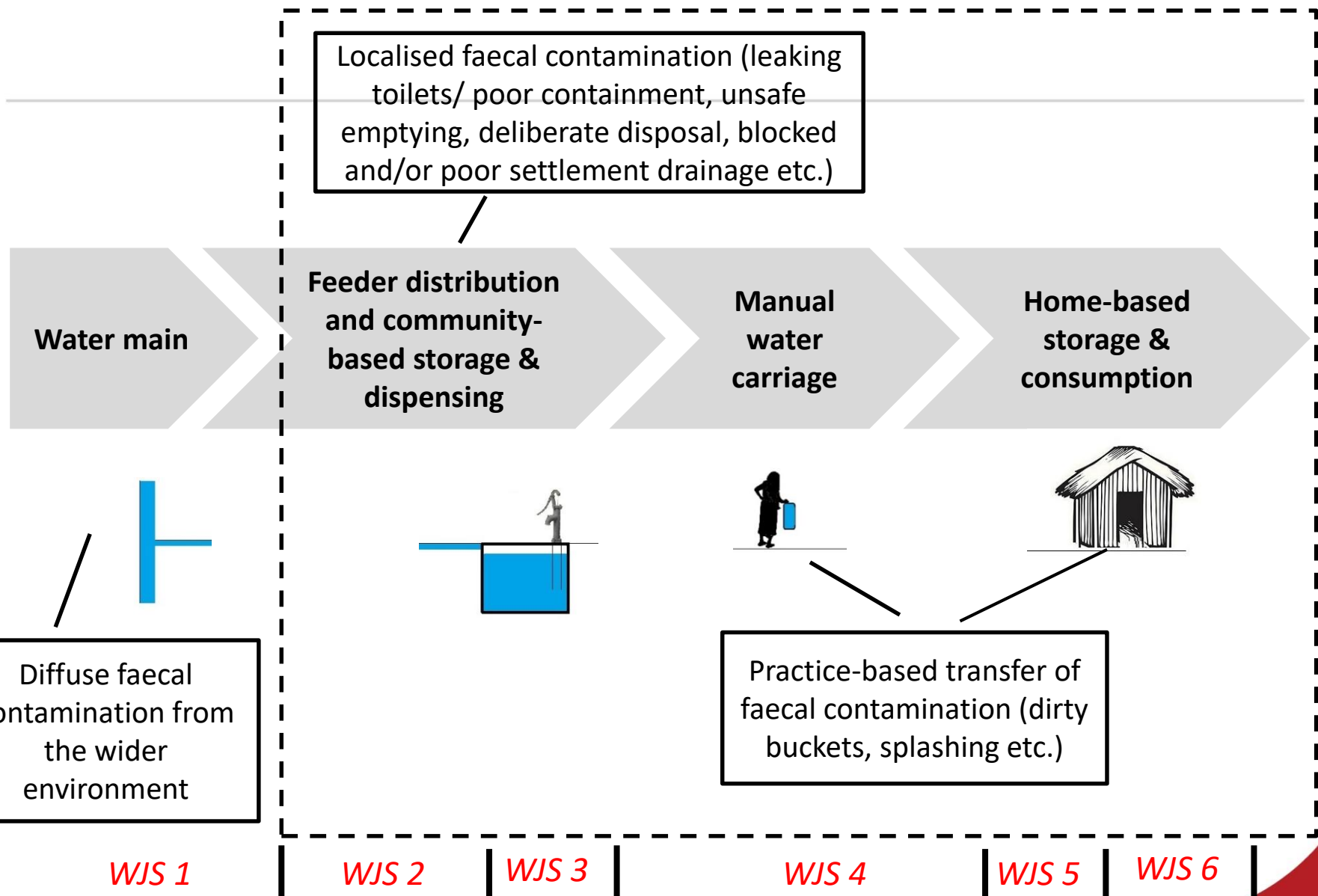
Inevitably, faecal waste is released to local environment, and ultimately into potable water.



The space/distance that people carry water in buckets from standpipes to home
= the last 100 metres of potable water supply

Contaminants into drinking water journey stages (WJS)

L100M area of concern



L100M Hypotheses

1. By expanding the water safety practices beyond the household domain - faecal contamination of potable water will be ***modestly*** reduced, ***unsustainably***.
2. By tackling localised sources of faecal contamination as a separate sanitation safety activity - faecal contamination of potable water will be ***greatly*** reduced, ***sustainably***.
3. By combining expanded water safety practices to sanitation safety there is little gain over sanitation safety alone.

THEROY OF CHANGE

Adapting WSP (Water Safety Plan)

- Promote low-cost education based initiatives
- Identify and prevent negative feedback (e.g. safeguarding reserve tank integrity)
- Clean, at regular intervals, overhead and underground community storage
- Raise awareness and prevent cross-contamination
- Identify and rectify zones of extreme water contamination (e.g. toilet blocks adjacent to water reserve tanks)



Adapting SSP (Sanitation Safety Plan)

- Clean drain on a regular basis (before, during and after rainy season)
- Empty onsite sanitation system and safely dispose
- Undertake remedial work on onsite sanitation system
- Tackle open defecation (including children faeces)
- Minimise externally sourced faecal dumping
- Minimise unsafe supernatant
- Tackle over-stressed toilets (new infrastructure)



- Making the invisible visible (science communication) via *the community adolescent girls*
 - Identify positive practices
 - Promote local and sustainable safeguarding practices (institution building)
 - Foster entrepreneurship

PICOT framework

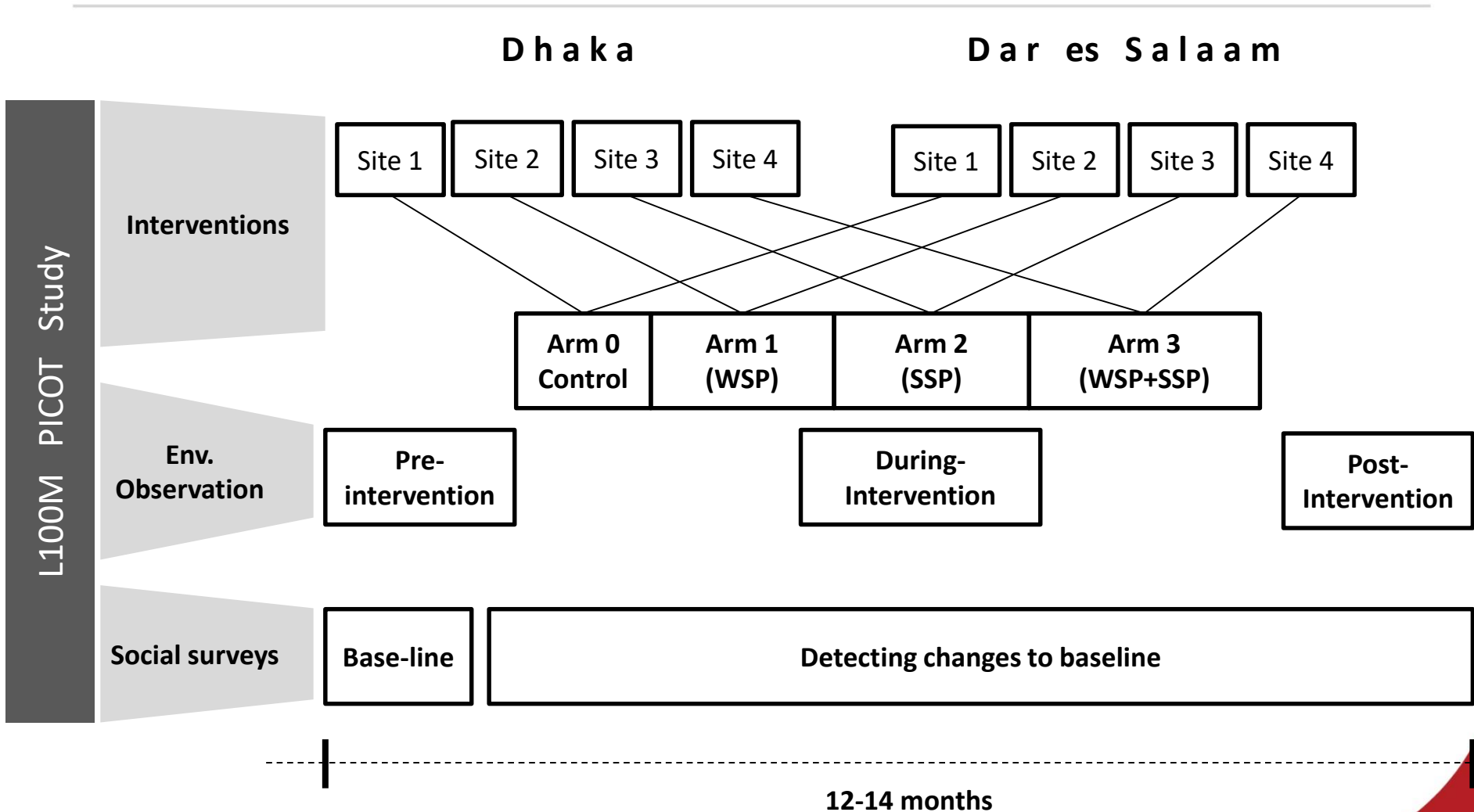
- **P (Population)**

- Step 1 – settlement selection →
- Step 2 – settlement characterisation
- Step 3 – focus area

1. Water supply (could be different sources and/or combinations, but preferably community water points)
2. 'Containment' of sewage (i.e. pit latrines; septic tank)
3. Containment facilities must be older than one year
4. Presence of drainage network (including a main channel)
5. Community engagement/presence of CBOs
6. Similar socio-economic profile and population size
7. Similar landscape characteristics
8. Relatively less eviction threats

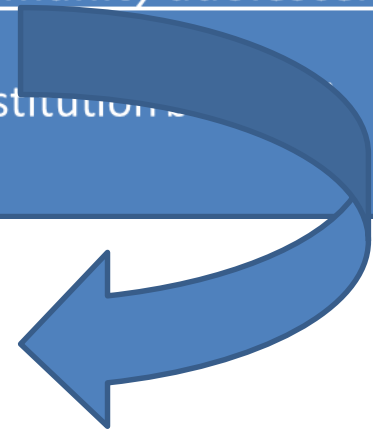
- **I (Intervention)** – WSP alone; SSP alone; and WSP and SSP.
- **C (Comparison)** – baseline environmental, social and well-being indicators.
- **O (Outcome)** – undertake pre-, during- and post-intervention environmental observations alongside the continuing collection of social survey data as well as SFDs
- **T (Time)** – 12 month period.

L100M Research Design & Approach



Some of our most useful interventions...

- Making the invisible visible (science communication) via *the community adolescent girls*
 - Identify positive practices
 - Promote local and sustainable safeguarding practices (institutional)
 - Foster entrepreneurship



Involving the community Adolescent Girls

Let's see a recent Twitter Handle

You may also read a Lancaster University News Blog on “Young women pioneer clean water changes in Dhaka” [here](#)

Why adolescent girls?

- Current role within the household
- In Bangladeshi culture, they're often viewed as an embodiment of their grandmother
- Future role within their community and society as a whole
 - Future mothers
 - Future leaders - translating the “youth bulge” into a demographic dividend.

They call themselves *Koishorer Agrodut* (Adolescent Forerunners)

- Adolescent girls were trained in the basic science relating to water contamination.
- Knowledge sharing - leading social change from within communities.



Impacts

“Before, I didn’t know [about] . . . diseases caused by drinking unsafe water. I also learned that we should cover water with a lid and keep it high up so that dirt can’t mix with it.” Tamanna.



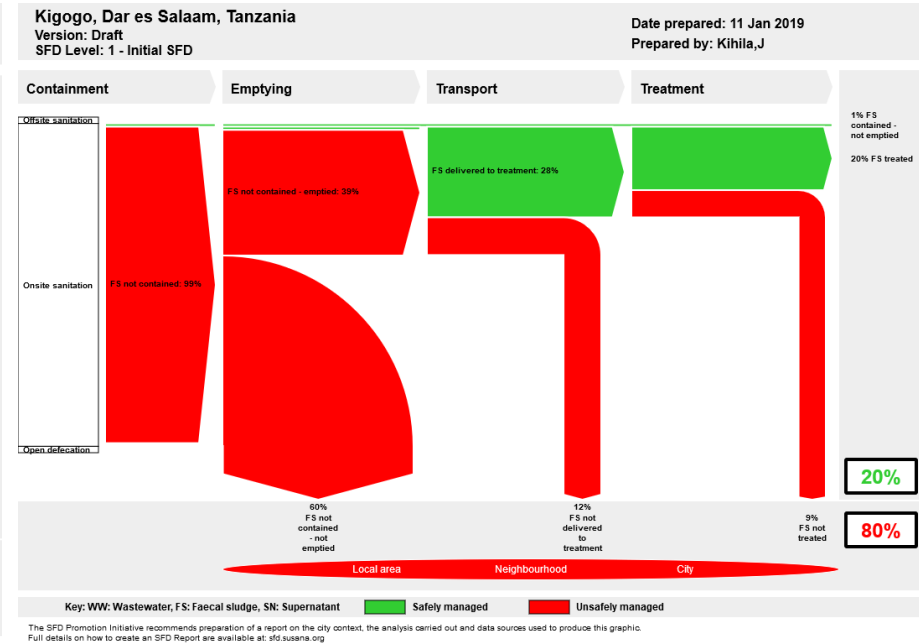
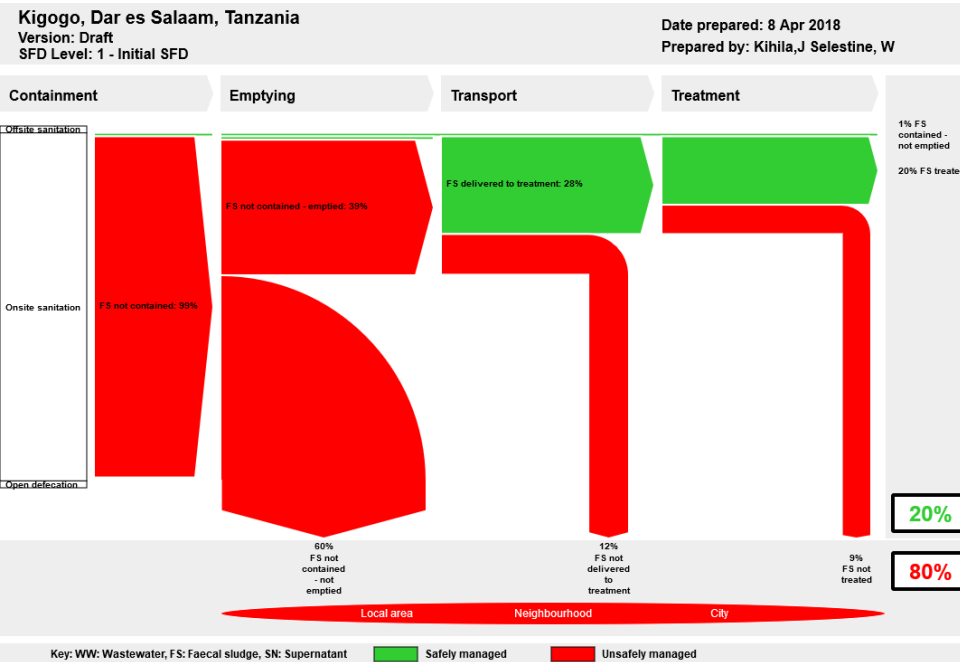
“When I have children I will teach them the necessity of washing hands before eating and after the toilet. This will remain with me throughout my life. . .” Lucky, Beguntila.



Our analytical findings

SFDs in Dar es Salaam

Site 1

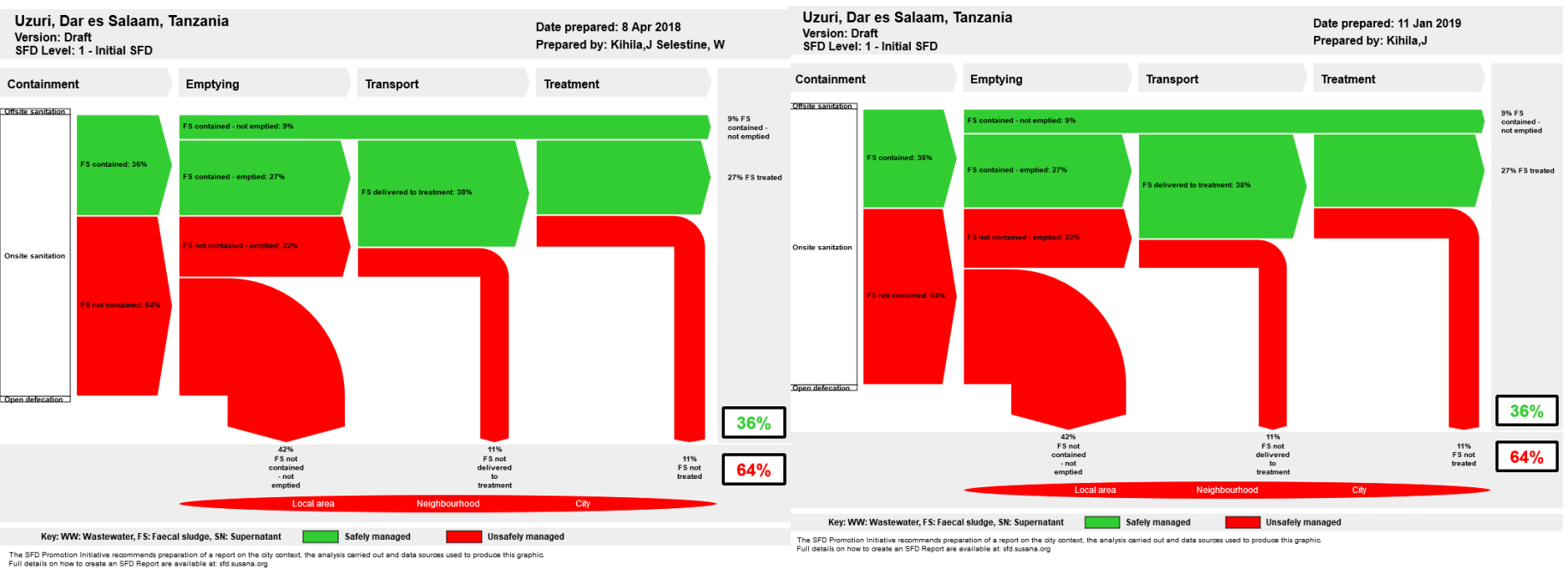


Control settlement – no change

The SFD Promotion Initiative recommends preparation of a report on the city context, the analysis carried out and data sources used to produce this graphic. Full details on how to create an SFD Report are available at: sfd.susana.org

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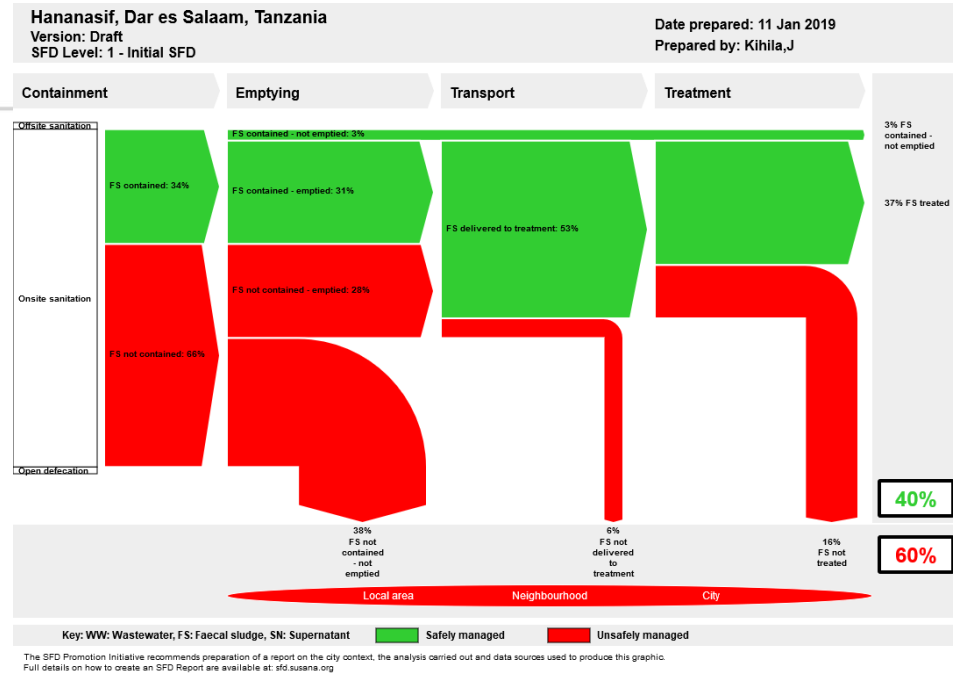
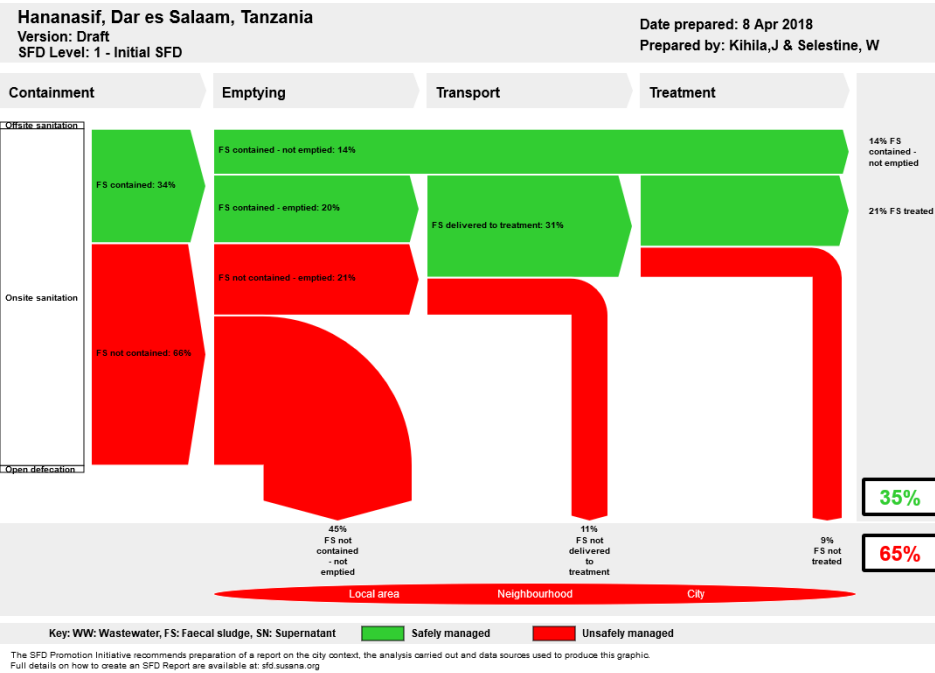
Site 2



Intervention arm 1: WSP

- Raising levels of flooded water meters and replacing worn out meter boxes
- Repair of leaking water pipes and faulty joints
- Behavioral change promotion

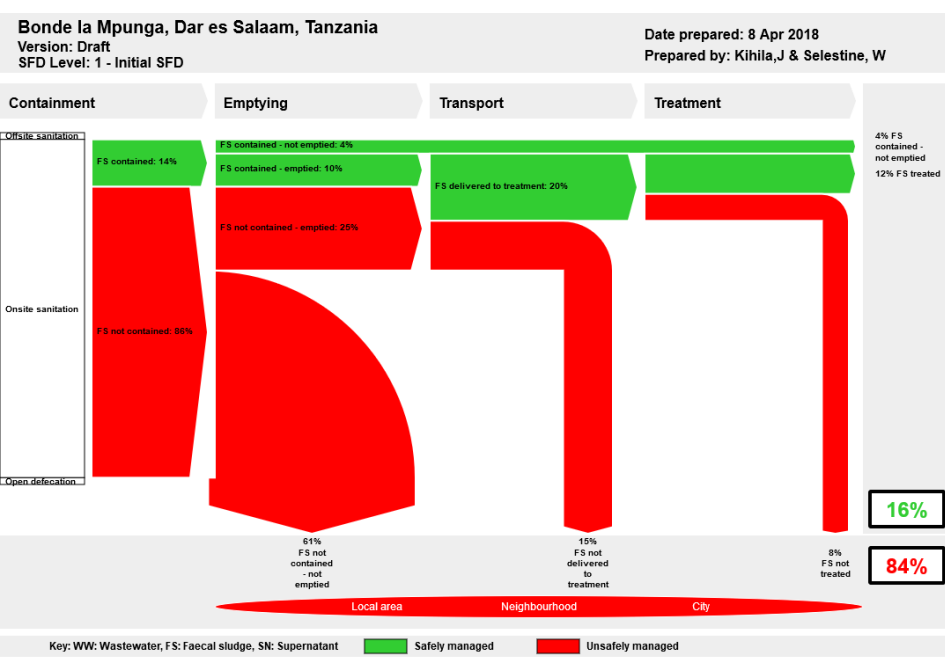
Site 3



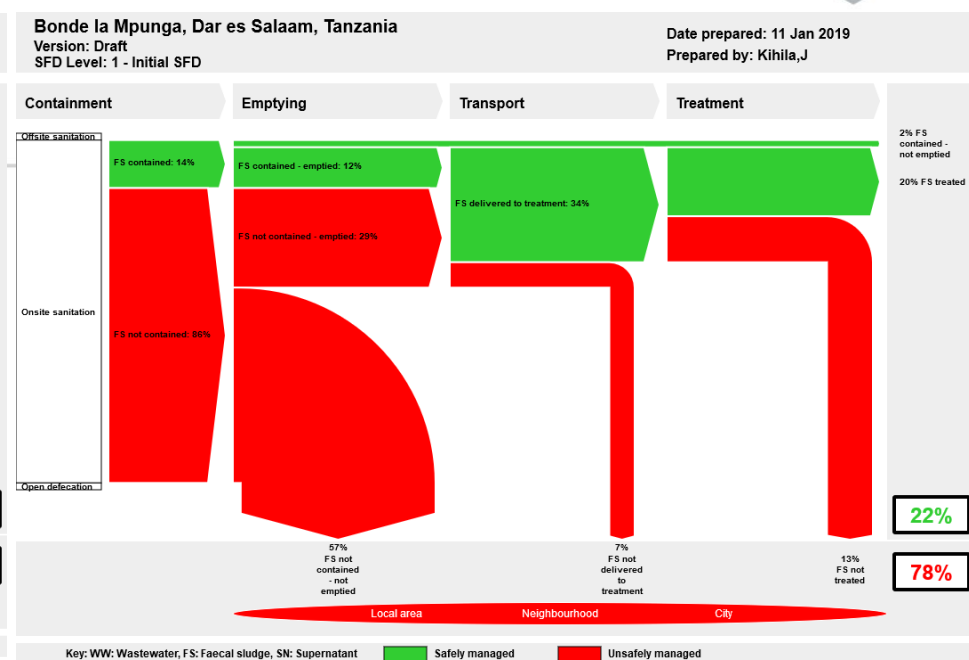
Intervention arm 2: SSP

- Repairs of containments that were in a bad condition
- Desludging of toilets
- Behavior change promotion

Site 4



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Intervention arm 3: WSP and SSP

- Raising levels of flooded water meters and replacing worn out meter boxes
- Repair of leaking water pipes and faulty joints
- Repairs of containments that were in bad situation
- Desludging of toilets
- Behavior change promotion

Pre-/During-/Post-intervention Faecal Coliform in drinking water test – A snapshot in Dhaka (intervention arm 3)

PRE-

Water Journey Stage (WJS 1)

WJS 2

WJS 3

WJS 4

WJS 5

WJS 6

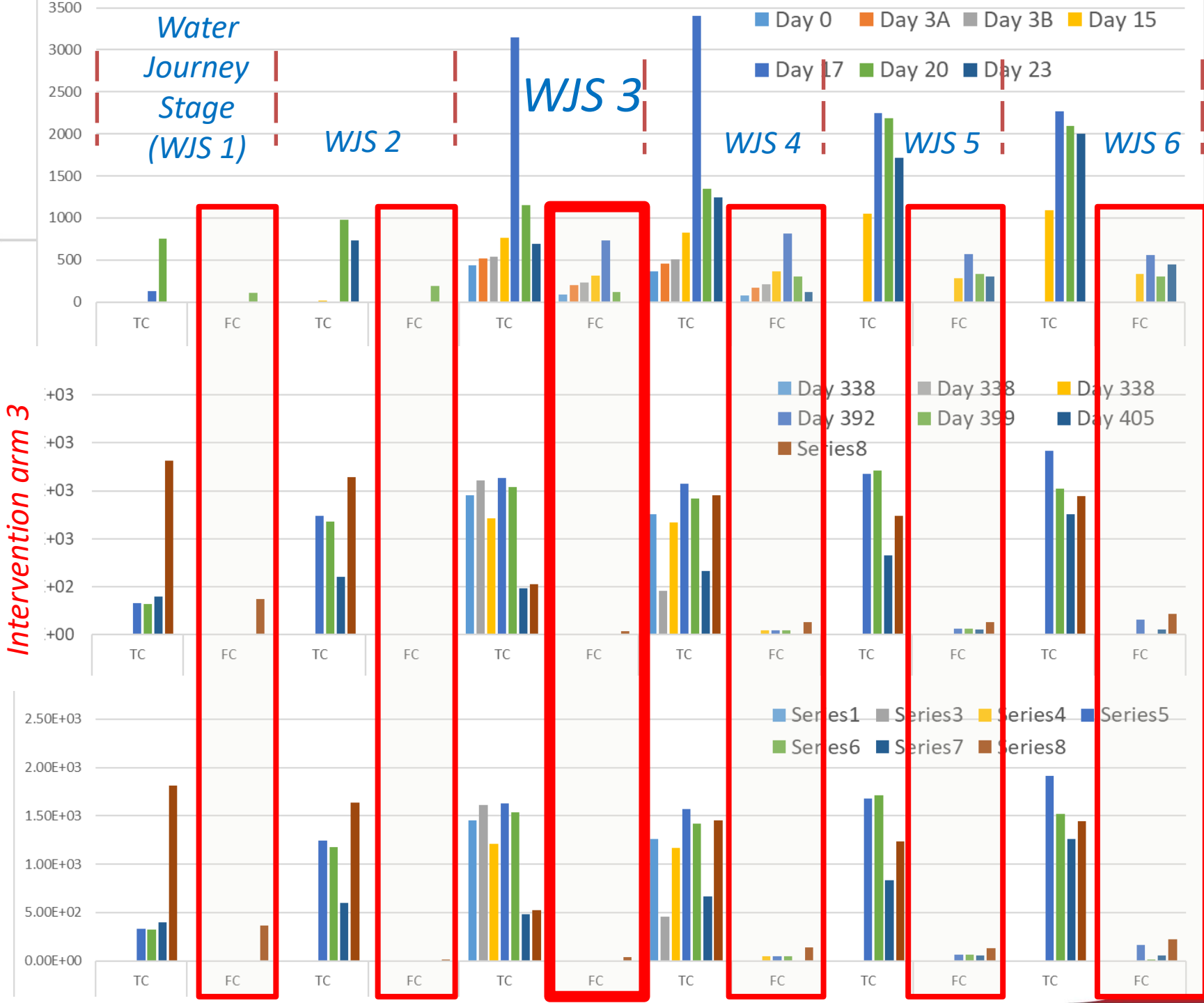
Day 0 Day 3A Day 3B Day 15 Day 17 Day 20 Day 23

During - Intervention arm 3

Day 338 Day 392 Day 399 Series8

POST-

Series1 Series3 Series4 Series5 Series6 Series7 Series8



Dar es Salaam v/s Dhaka - KEY FACTS

- Water quality at source is consistently better than Dhaka.
- At the point of consumption, water gets moderately contaminated when consumed within the day of collection. Contamination shoots up with length of storage – a practice that is quite common.
- The reduction in contamination in intervention arm 4 is less pronounced than Dhaka.
- Mobilising adolescent girls is much harder in Dar es Salaam than in Dhaka.

And some EXPLANATIONS

1. In Dhaka, local shared water and toilet facilities are predominantly NGO-provided;

In Dar es Salaam, while toilets are owner-built, water connections are (para) municipality controlled, with little or no NGO involvement. Lack of NGO presence affects collective action.

2. Settlements in Dhaka are > 20 times more densely populated than in Dar es Salaam.
3. Water in Dar es Salaam is chlorinated at source; studies have found traces of residual chlorine in household waters, which explains why the quality is better at final point of consumption.

Emerging lessons

- Assisted WASH interventions can deliver positive outcomes; expecting poorer citizens to take full responsibilities is neither fair nor viable.
- We need more experiments to improve models and identify business/ scaling-up options. Civil society and the private sector must bridge with government agencies (= political coalition)
- Involving the ‘community youth’ has profoundly transformed our thinking; and we are already thinking big about them!

Thanks a lot!

