

What lessons can we learn from the global implementation of SFDs?



Barbara Evans and Andy Peal
University of Leeds

SFD Africa Launch: April, 2020

What can we learn from the data compiled so far?

- To date SFD-PI has supported SFD process in 118 cities
- What does this tell us about urban sanitation generally?
 - SFDs at city, national and regional levels?
 - Where to focus interventions?
 - What trends are emerging?
 - How can we link with or support initiatives?
 - How to increase database?
- How does this relate to monitoring SDG 6.2?



Estimating Safely Managed Sanitation in Urban Areas; Lessons Learned From a Global Implementation of Excreta-Flow Diagrams

Andy Peal¹, Barbara Evans^{2*}, Sangaralingam Athilan^{3,4}, Radu Ban⁵, Isabel Blackett^{6,7}, Peter Hawkins^{8,9}, Lars Schoebitz¹⁰, Rebecca Scott¹¹, Andy Slagh¹², Linda Strande¹³ and Oscar Veses¹⁴

¹Independent Consultant, Macclesfield, United Kingdom, ²water@leeds, School of Civil Engineering, University of Leeds, Leeds, United Kingdom, ³Centre for Water Systems, College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter, United Kingdom, ⁴Bill & Melinda Gates Foundation, Seattle, WA, United States, ⁵Water and Sanitation Program (WSP), World Bank, Washington, DC, United States, ⁶Independent Consultant, Sutton Coldfield, United Kingdom, ⁷Independent Consultant, Norwich, United Kingdom, ⁸Living, Swiss Federal Institute of Aquatic Science and Technology, Dübendorf, Switzerland, ⁹Department of Water, Sanitation and Solid Waste for Development, Dübendorf, Switzerland, ¹⁰Independent Consultant, Lars Schöbitz GmbH, Zurich, Switzerland, ¹¹Water Engineering and Development Centre (WEDC), Loughborough University, Loughborough, United Kingdom

OPEN ACCESS

Edited by:

Chris Christenson,
University of Edinburgh,
United Kingdom

Reviewed by:

Muhammad Hanan,
Shanghai Jiao Tong University, China
Dimitri G. Koutas,
Rijkswaterstaat, Netherlands
Elizabeth Wiley,
The Malaysian Polytechnic, University of
Malaya, Malaysia

*Correspondence:

Barbara Evans
b.e.evans@leeds.ac.uk

Specialty section:

This article was submitted to
Water and Wastewater Management,
a section of the journal
Frontiers in Environmental Science

Received: 13 September 2019

Accepted: 07 January 2020

Published: 30 January 2020

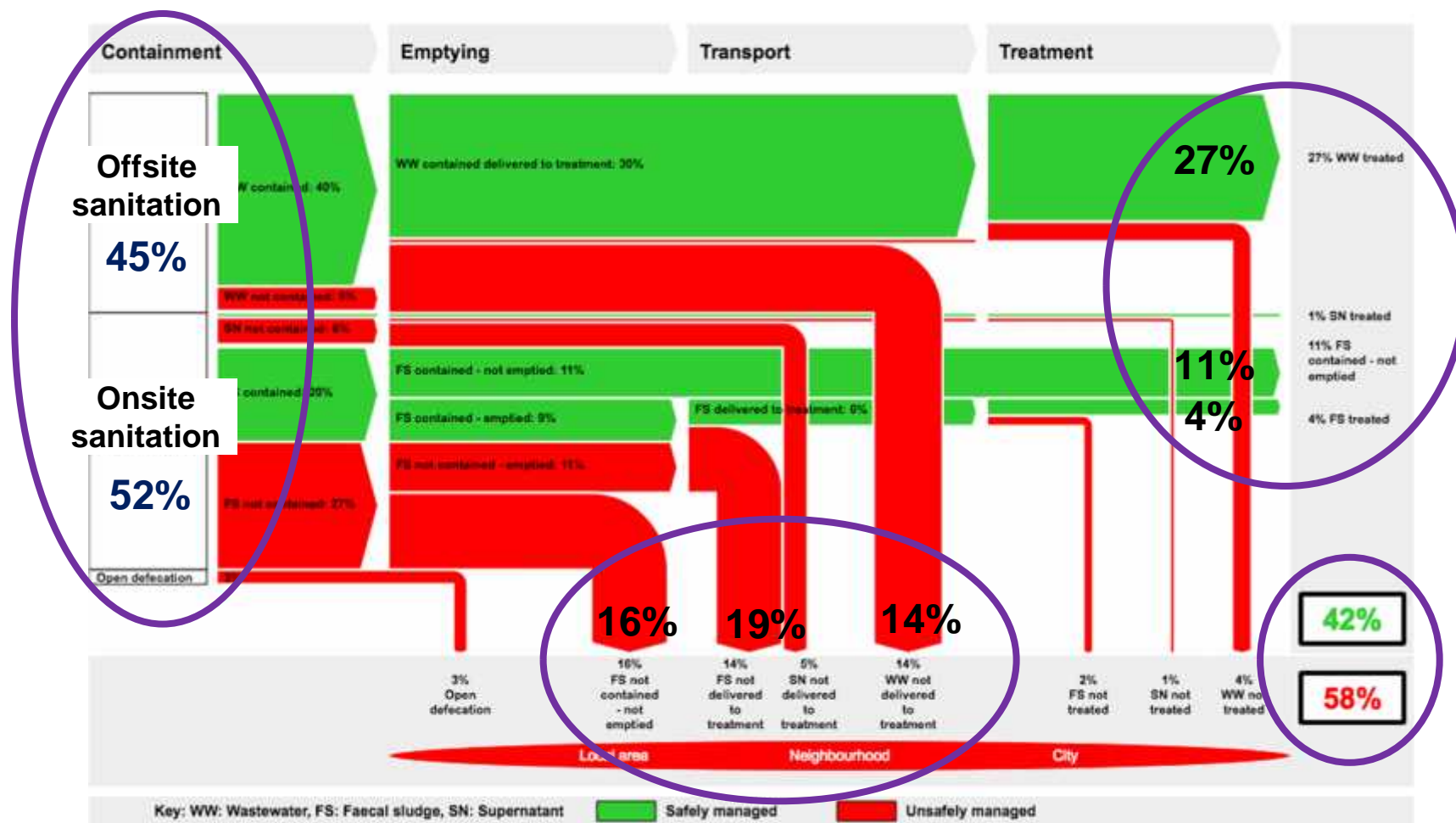
Citation:

Peal A, Evans B, Athilan S, Ban R,
Blackett I, Hawkins P, Schoebitz L,
Scott R, Slagh A, Strande L and
Veses O (2020) Estimating Safely
Managed Sanitation in Urban Areas:
Lessons Learned From a Global
Implementation of Excreta-Flow
Diagrams. *Front. Environ. Sci.* 8:7.
doi: 10.3389/fenv.2020.00007

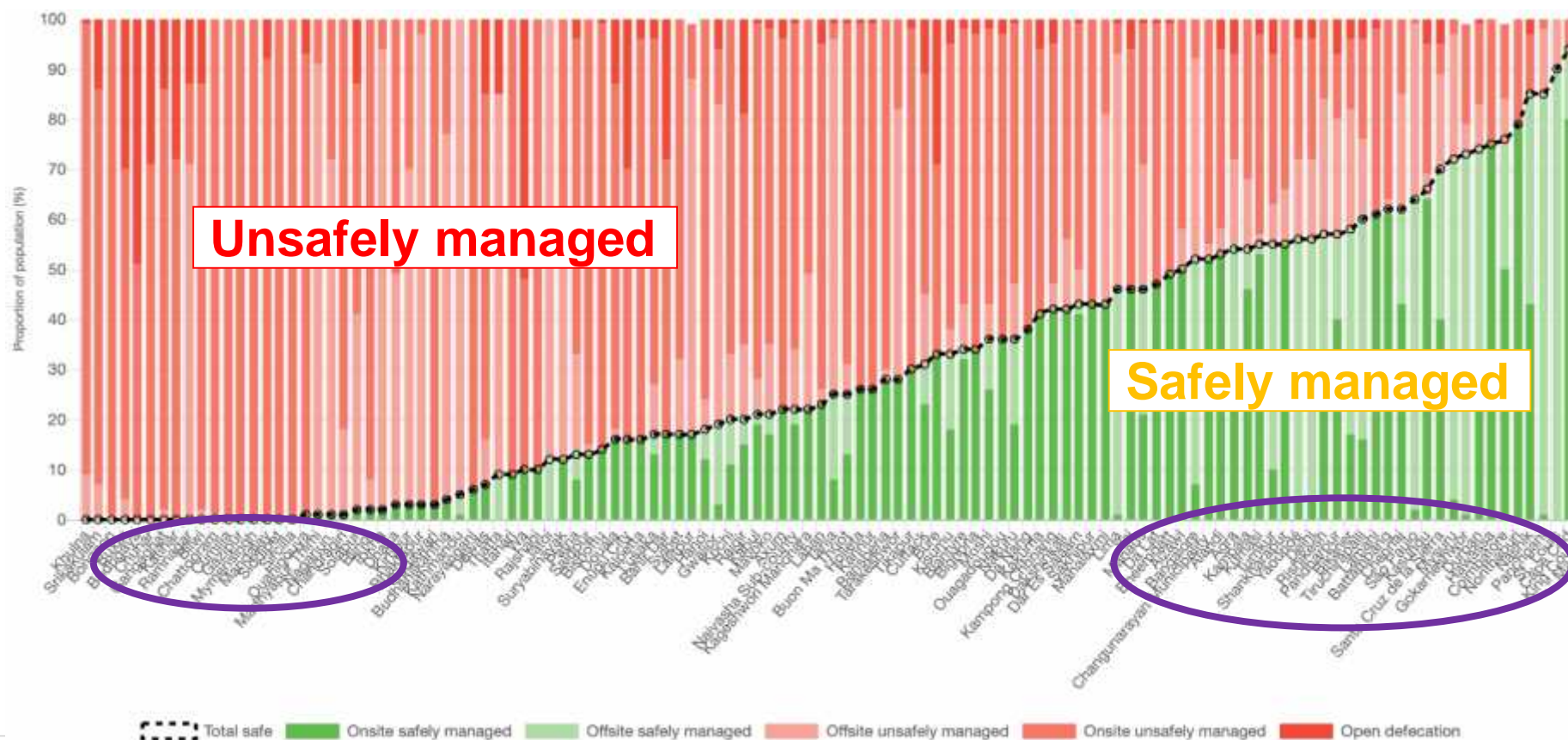
The urban population will rise to 6.7 billion by 2050. The United Nations has committed to provide everyone with safely managed sanitation, but there is limited understanding of the scale of the challenge. This paper describes a methodology for rapid assessment of sanitation in cities including a graphical representation (a shit-flow diagram or SFD) and reports on findings from implementation in 39 cities. The SFD provides high level information for planning purposes covering the entire sanitation system in a city. More than half of the human excreta produced in these cities is not safely managed. The most significant portions of the unsafely managed excreta are: (i) contents of pits and tanks which are not emptied and are overflowing, leaking, or discharging to the surrounding environment (14%); (ii) contents of pits and tanks which are emptied but not delivered to treatment (16%); (iii) fecal sludge and supernatant delivered to treatment but not treated (3%); (iv) wastewater in sewers not delivered to treatment (14%); and (v) wastewater delivered to treatment but not treated (6%). Many cities currently relying on onsite sanitation for safe storage, particularly in Africa, will need new strategies as populations grow. Containment systems that discharge to open drains are common in some Asian cities; these pose a public health risk. Dumping of excreta is widespread and there is a lack of realistic performance data on which estimates of the extent and effectiveness of treatment can be made. The SFD production process can be challenging due to a lack of data and low technical capacity in cities. There is often uncertainty over terminology and over the status of infrastructure. Formalizing definitions for the SFD preparation process was found to be useful in overcoming capacity constraints in cities. The SFD produces a credible snapshot of the sanitation situation in a city. The paper provides evidence of the urgent need for improved management and monitoring of urban sanitation in cities around the world and highlights the role of the SFD as a planning tool.

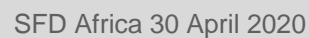
Keywords: urban sanitation, monitoring, health risk, excreta flow diagram, SFD, shit-flow diagram

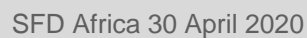
Global SFD: 118 cities (population 150 million)



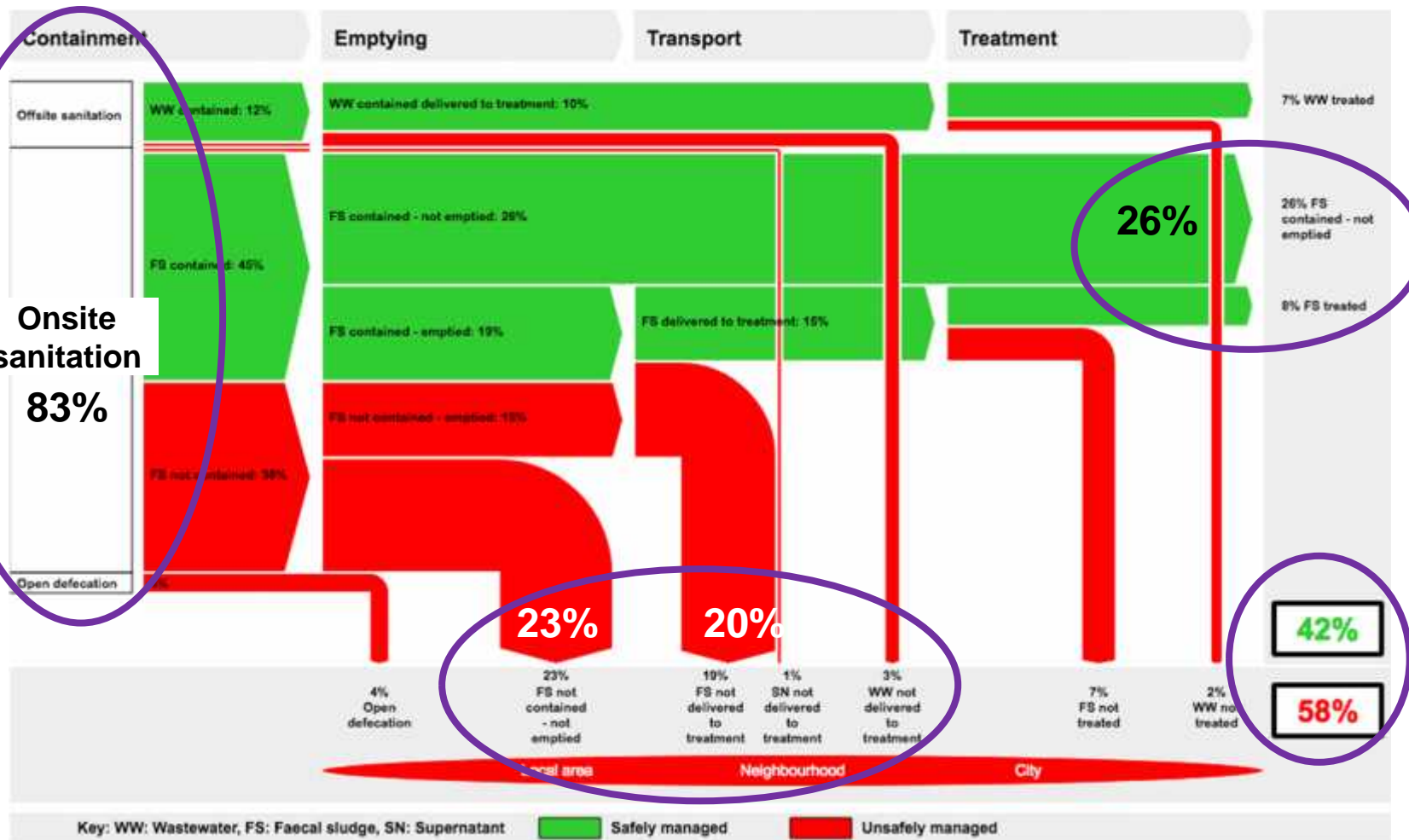
Proportion of population with safely managed sanitation by city (118 cities)







Africa SFD: 27 cities





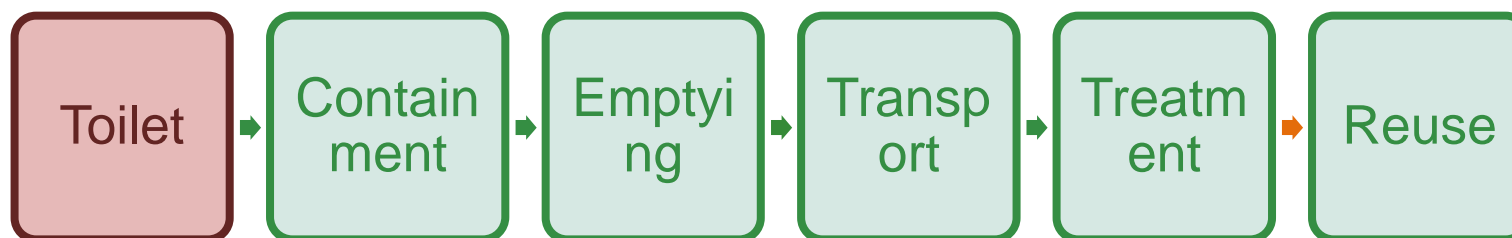
SFDs Worldwide

Region	Reviewed SFD	Draft version available	Under preparation
Asia & Pacific	81	4	2
North America	4	0	0
Latin America & Caribbean	6	2	3
Sub-Saharan Africa	27	0	11
Middle East & Northern Africa	0	3	5
Total	118	9	21

Summary

- City SFD helps identify where interventions required and priorities
- Provides a snapshot of current situation, therefore important to understand context
- Supporting advocacy at city, national and regional level, including global sector initiatives (eg JMP)
- Methodology established, focus now on increasing use and therefore larger database

Excreta flow in Sanitation service chain



SDG 6.2: use of Safely Managed Sanitation Services (SMSS)

- Need to think about excreta flows throughout the service chain!
- Assess whether excreta flows are **safely/unsafely managed**

Shit Flow Diagrams (SFDs) developed for urban settings

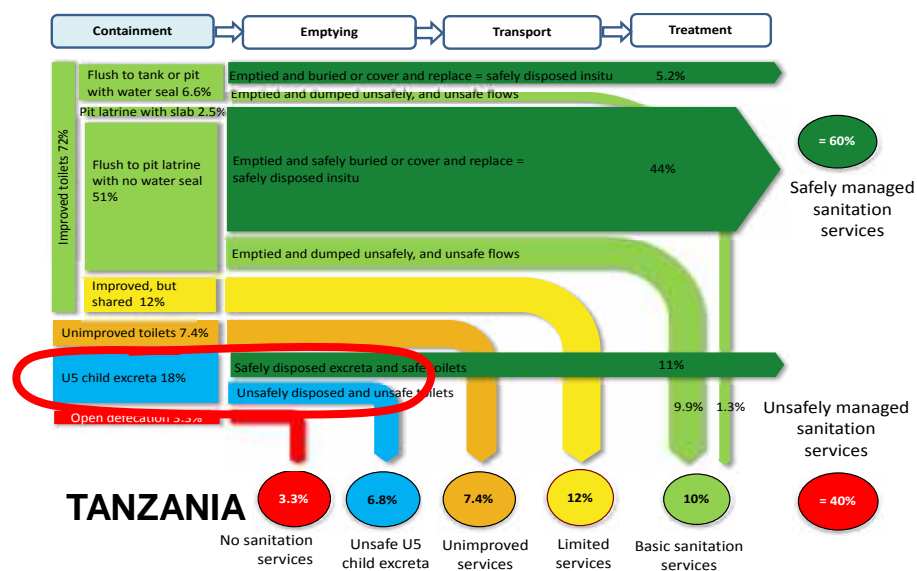
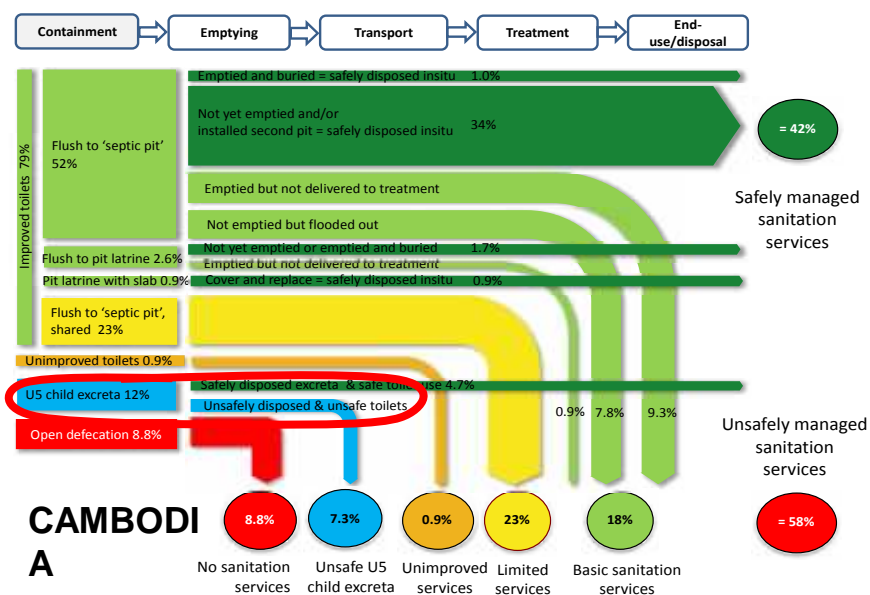
- Map excreta flows through chain for different technology types
- Assess hazard & present excreta flows in a clear diagram
- Summarise **% safely managed** & **% unsafely managed**



GUIDELINES ON SANITATION AND HEALTH

SHIT FLOW DIAGRAMS FOR LESS URBAN AREAS?

SNV, GSF, Andy Peal, Andy Robinson (forthcoming)



Thank you!

**Please visit
www.sfd.susana.org**

SFD Promotion Initiative

**sustainable
sanitation
alliance**

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

Co-funded by
 Federal Ministry
for Economic Cooperation
and Development


UNIVERSITY OF LEEDS

 **WORLD BANK GROUP**
Water

 **GWSP**
GLOBAL WATER
SECURITY & SANITATION
PARTNERSHIP

WEDC

 **Loughborough
University**

CSE


eawag
aquatic research

BILGIMILINDA
GIZTA (GIZ Technology Africa)