SFD Promotion Initiative

What is an SFD?

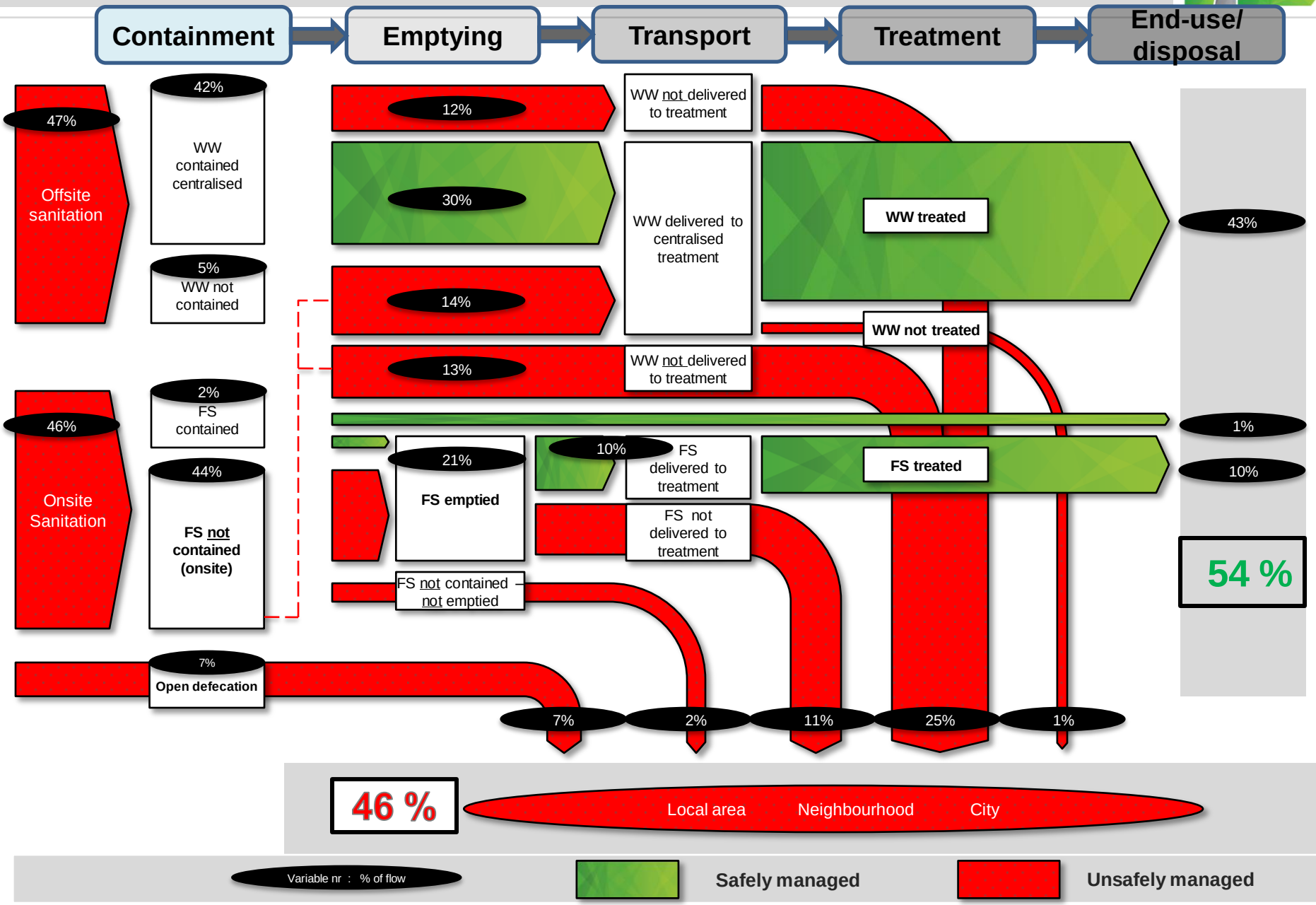
What it is …..

- A tool for engineers, planners and decision-makers
- Based on contributing **populations** and an indication of where their excreta goes
- A representation of **public health hazard**
- An effective communications and **advocacy tool**
- An overview from which to develop sanitation priorities

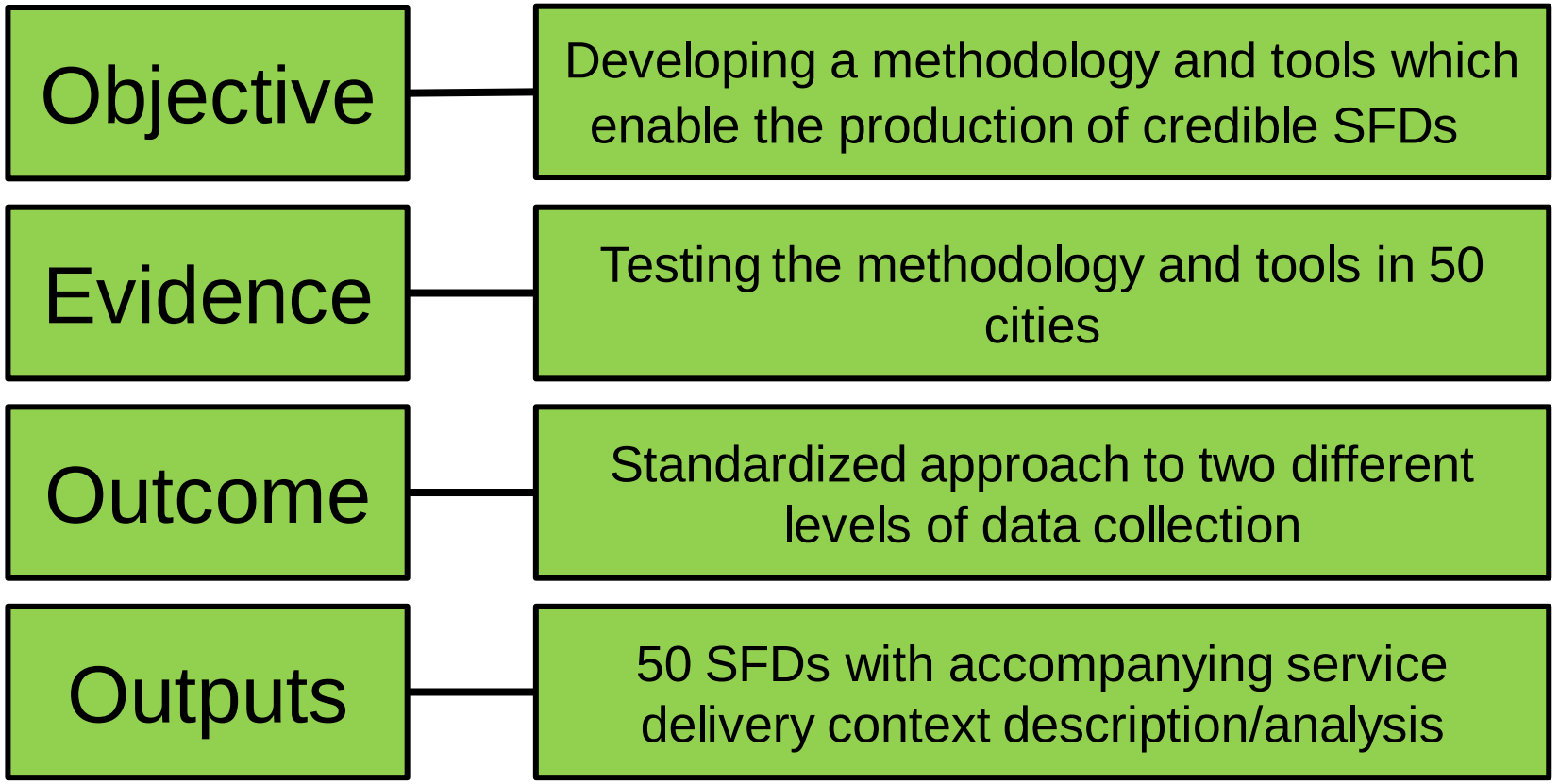
What it is NOT…..

- Based on actual volumes/mass – these are determined by other related factors
- A representation of public health risk (risk = hazard x behavior)
- A precise scientific analytical tool

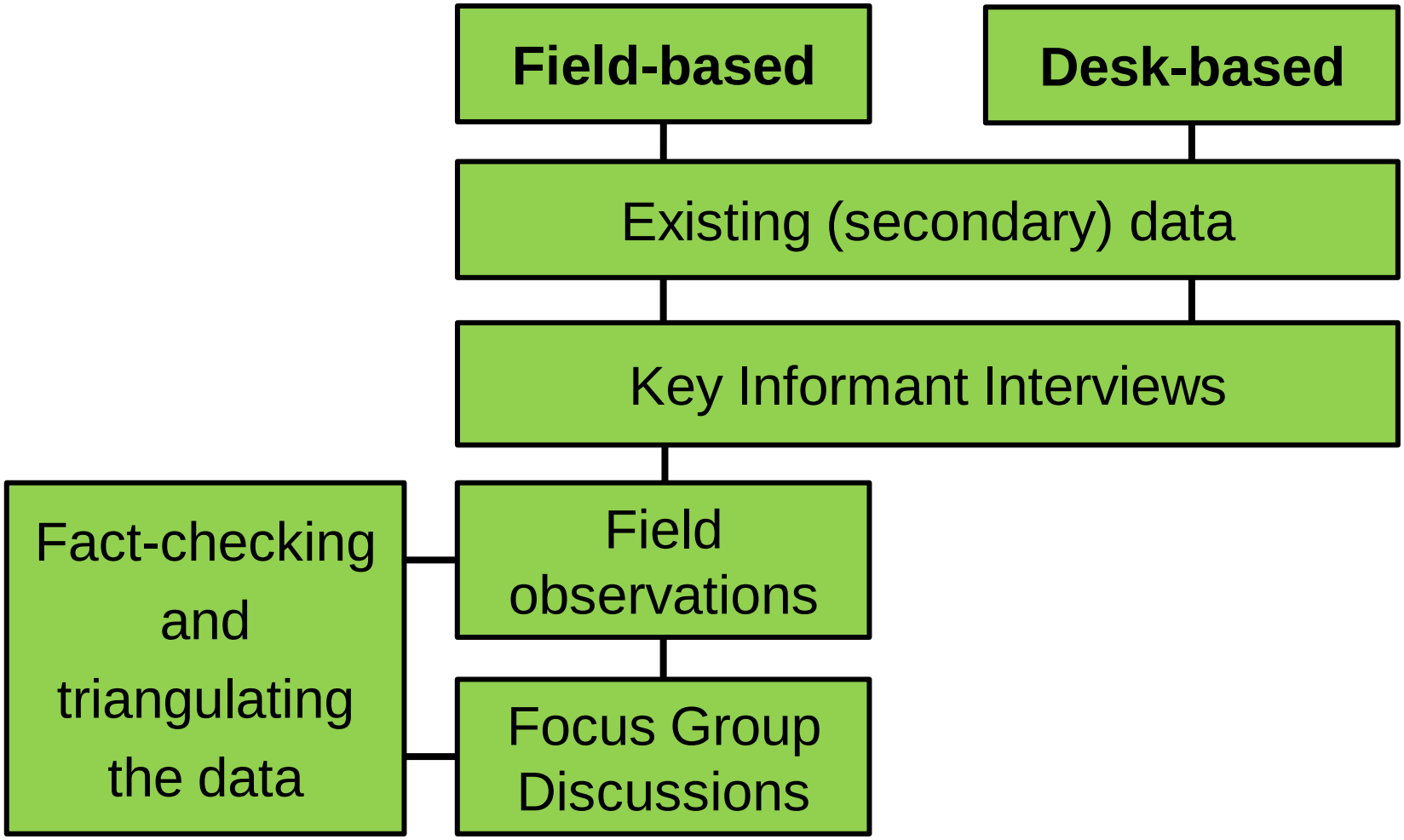
Agra – 21 October 2015
Desk based



SFD Promotion Initiative



Outcome: Standardized approach

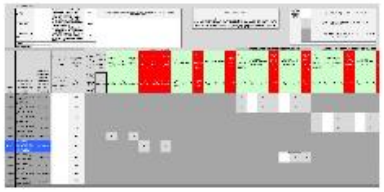


How to make a sfd

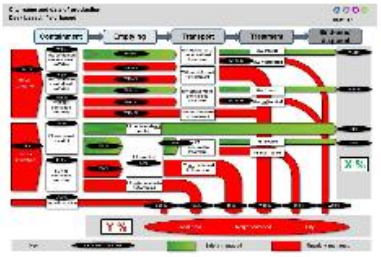
The SFD Toolbox comprises:

- The Manual for SFD Production (Draft)
- The SFD calculation tool (Draft)
- The Stakeholder Tracking Tool (Draft)
- The SFD Master Diagram (Draft)

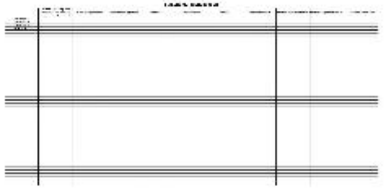
Manual for SFD Production (Draft)



SFD Calculation Tool (Draft)



SFD Master Diagram (Draft)



Stakeholder Tracking Tool (Draft)

How to make an SFD

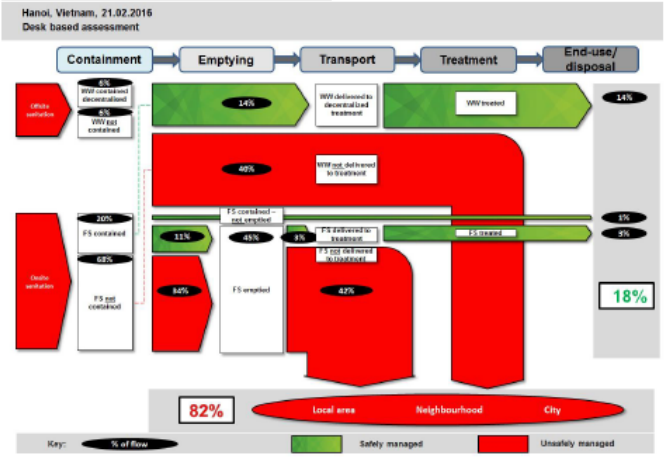
World Exclusive!

Data and assumptions

City	Nakuru, Kenya	Indian Cities
Level	**Desk**	**Desk /field based**
Data sources	**Secondary Sources** Websites: 'Opendata', census, water company, general city data. **Paper based data:** WEDC, PhD, NGO & project reports **Primary sources** Key informant interviews: Gatekeepers, water company different areas, Local Government, NGOs	**Secondary Sources** • Census • City Sanitation Plans • Service Level Benchmarks • Pollution Control Board reports **Primary Sources** Key Informant Interviews, Focus group Discussions, Field observations
Challenges	• Detail of data required • Gatekeepers to the sector – buy-in • Current focus of authorities is on Low income areas (less on other areas) • Snowballing of interviews	• Discrepancy in the secondary data and on ground situation • Limited/no data available
Confidence	• Validation of data through consultation with stakeholders, and following the project "Strategy for QA/QC"	• Validation of data through primary survey of relevant stakeholders

The product ....

1. The Diagram



2. Diagram information

The Shit Flow Diagram (SFD) was created through desk-based research by Sandec (Sanitation, Water and Solid Waste for Development) of Eawag (the Swiss Federal Institute of Aquatic Science and Technology)

Collaborating partners:
Viet-Anh Nguyen from the Institute of Environmental Science and Engineering (IESE), Hanoi University of Civil Engineering (HUCE)

Status:
Final SFD. Not yet reviewed by external committee.

Date of production:

21/02/2016

3. General city information

Hanoi, the capital of Vietnam, is located in the Northern part of the country in the Red river delta. For the SFD project, the 12 urban districts of Hanoi were selected for inclusion, as the other districts have a rural character and different public and environmental health concerns. The urban districts (from now on referred to as Hanoi) cover an area of 304 km² with an estimated population of 3,147,000 inhabitants (44% of the population in 9% of the area of Hanoi Province) (HSO 2011; GSO 2015).

Half of the districts have population densities above 20,000 inhabitants per km² while the other half below 10,000 inhabitants per km² (HSO 2011). This illustrates the variation between dense urban districts in the centre of the city and districts where peri-urban characteristics prevail. The average household size is 4.5 people per household (Nguyen *et al.* 2011; Cornel *et al.* 2012). Large influxes of daily commuters and tourists are expected in the city, however due to lack of data it was not included in the calculations.

Hanoi has a flat topography and lies at around 7 m above sea level in a region of subtropical monsoon climate (Cornel *et al.* 2012). The warm rainy season lasts from May to October with over 80% of the average annual rainfall of 1,689 mm, leading to frequent flooding (Fischer *et al.* 2011). Most surface water bodies in Hanoi (e.g. the three main rivers: To Lich, Kim Nguu and Nhue river) are highly polluted with wastewater and faecal sludge (Nguyen *et al.* 2011; Nguyen 2016)

Executive Summary Hanoi Vietnam Produced by: Eawag/Sandec

4. Service delivery context

Vietnam has a comprehensive legal framework of laws, decrees, decisions and other legal documents on the wastewater sector, while faecal sludge management has not yet received the necessary attention. However, with the recent Decree 80/2014 on the Drainage and Treatment of Wastewater (GOV 2014), accompanied by the new Circular 04/2015 (MOC 2015), the need for adequate faecal sludge management has now been acknowledged. The national Laws on Water Resources and on Environmental Projection emphasize the prevention of pollution of water resources and call for compensation from "any organization, family household or individual" (NAV 2014) causing environmental pollution, based on the "polluter pays principle" (NAV 2012).

As of the Decree 80/2014 (GOV 2014) and earlier ones, every household in the service area of a sewer network is obliged to connect to the sewerage system. In addition, the Vietnam Building Code required the instalment of septic tanks for every household in such areas (MOC 2008), resulting in onsite sanitation technologies being connected to the drainage network (Cornel *et al.* 2012; Nguyen *et al.* 2011).

Periodic emptying of septic tanks (by specialized vehicles) will for the first time be required by law in the Decree 80/2014 (GOV 2014). This policy is specified in the Circular 04/2015 (MOC 2015), which also requires documentation and monitoring of collected and treated faecal sludge by the relevant stakeholders. The National Strategy of Integrated Solid Waste Management (PM 2009) sets out targets for faecal sludge collection and treatment for the years 2015, 2020 and 2025 to 30%, 50% and 100% respectively. Currently, most of the faecal sludge collection and transport service providers in Hanoi are private unregulated businesses, with only one existing faecal sludge treatment facility.

Targets on wastewater treatment are specified in the Master Plan of Socio-economic Development of Hanoi (PM 2011) to 80% of wastewater treated by 2020. Reuse of treated effluent from wastewater and faecal sludge treatment is encouraged (MOC 2015). Therefore, it can be concluded that policies on excreta management exist and Hanoi will make significant progress in the wastewater sector (Nguyen 2016), however, the targets are ambitious. It is also anticipated that with acknowledgement of the need of proper faecal sludge management, Hanoi's overall excreta management situation will improve in the future.

5. Service outcomes

For Hanoi it is estimated that 82% of the excreta is not managed safely, thus only 18% of the excreta is considered safely managed.

Although the result from the SFD decision support tool leads to a low groundwater contamination risk estimate for Hanoi, the authors wish to point out that surface water contamination is severe and groundwater recharge occurs to a large extent from highly polluted river water. The groundwater used for drinking purposes from low lying aquifers may not be in risk for faecal contamination, however, the groundwater near to the surface is likely highly contaminated.

As previously mentioned, the majority of households have septic tanks that are connected to the drainage network – an estimated 84%. Based on the calculation tool, 68% are considered to not contain faecal sludge as they are not connected to sewers but other types of drainage channels, open drains and canals not leading to wastewater treatment plants (WWTPs). The remaining inhabitants are either using flush toilets connected to the (partly combined, partly separate) sewer network or other combined drainage channels, canals and rivers (12%). Another 4% of the population employ onsite sanitation systems that contain faecal sludge, such as pit latrines and single or double vault latrines that are either used with or without urine diversion. Open defecation is estimated to be almost non-existent. (Harada *et al.* 2008; Nguyen *et al.* 2011; Chowdhry and Kone 2012). Of the 40% of the excreta that is not delivered to treatment 34% is from septic tank effluent and 6% from offsite sanitation technologies.

Emptying of septic tanks is challenging as in most cases these are constructed beneath houses without access, which requires that a hole is made from inside the house through the kitchen floor to provide access. At least 40 private emptying service providers with around 112 trucks serve Hanoi, in addition to Hanoi's Urban Environment Company (URENCO), which owns three to four vacuum trucks and empties public toilets in the inner districts. The privately owned service providers are legally registered businesses, however, they dispose of the vast majority of collected faecal sludge directly into the urban environment due to a lack of disposal and treatment facilities. This illegal disposal is represented as 42% - faecal sludge emptied but not delivered to treatment.

The story so far…

http://sfd.susana.org/sfd-worldwide

The next step: Phase 2

- **Demand led approach**
  - Capacity building
  - DIY SFD
  - QA/QC procedure
- **Help and support during the process**
  - FAQ/forums/website
  - sfd@susana.org
- **User friendly tools**
  - Incorporating the learning from piloting (Phase 1)
- **Platform for publication and knowledge exchange**

Come and speak to us!

Thank you for listening . . .

. . . and thanks to our local partners!

Please visit: www.sfd.susana.org

SFD Promotion Initiative

sustainable sanitation alliance

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of Federal Ministry for Economic Cooperation and Development

UNIVERSITY OF LEEDS

WORLD BANK GROUP Water

wsp water and sanitation program

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CSE

eawag aquatic research

Sandec Water and Sanitation in Developing Countries

Bill & Melinda Gates Foundation