Towards national and global monitoring of faecal sludge management

Rick Johnston
Tom Slaymaker

World Health Organization

WHO UNICEF JMP

unicef

WHO/UNICEF Joint Monitoring Programme

AfricaSan5 FSM5

Global sanitation ladder

WHO UNICEF JMP

Safely managed sanitation services: raised ambition

SERVICE LEVEL	DEFINITION
SAFELY MANAGED	Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or transported and treated offsite
BASIC	Use of improved facilities that are not shared with other households
LIMITED	Use of improved facilities shared between two or more households
UNIMPROVED	Use of pit latrines without a slab or platform, hanging latrines or bucket latrines
OPEN DEFECATION	Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches or other open spaces, or with solid waste

SDG 6.2.1

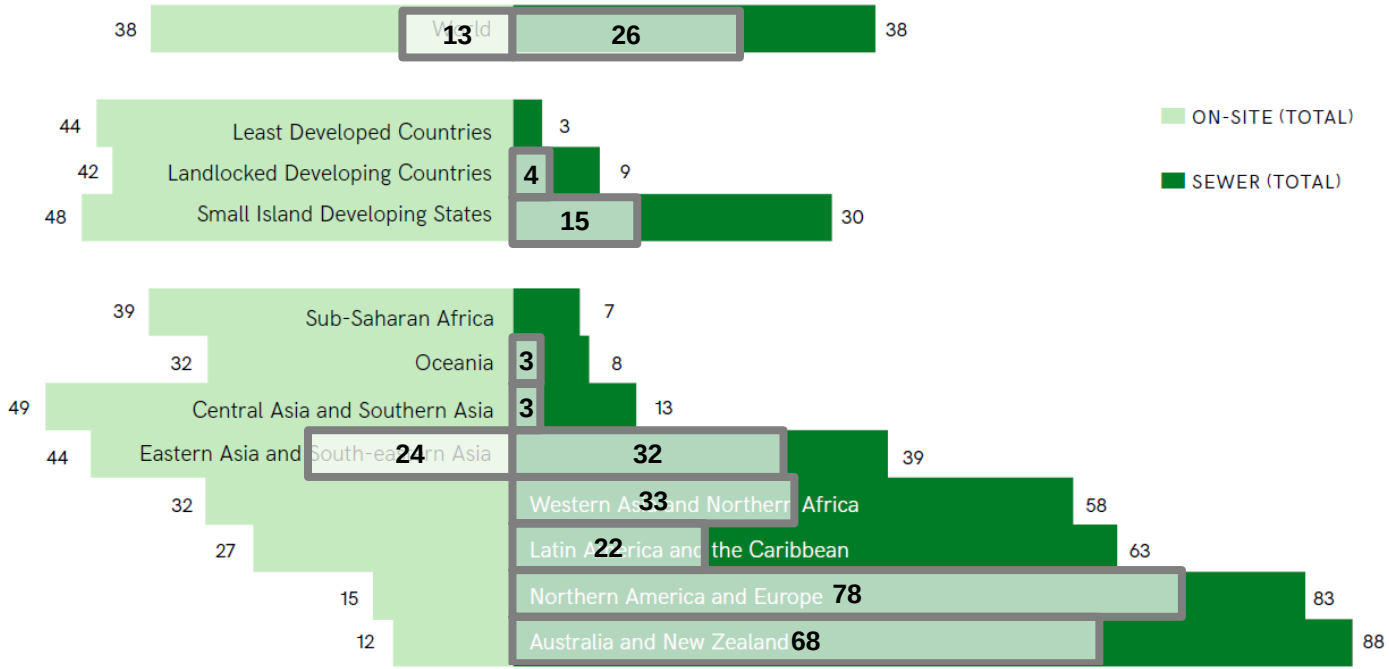
SDG 1.4.1

SDG 6.2.1

Non-sewered sanitation

WHO UNICEF JMP

Globally as many people use on-site sanitation as sewered systems



JMP country files

WHO UNICEF JMP

List national data sources used to produce estimates

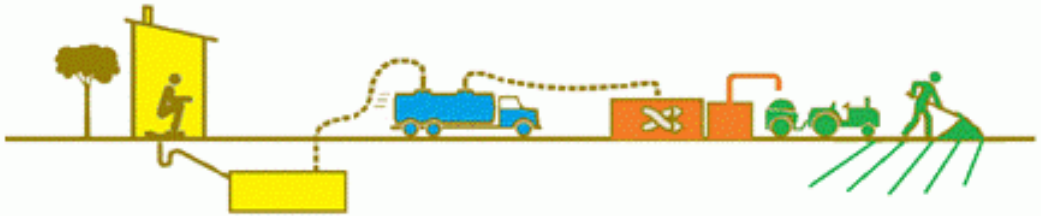
[values in square brackets not used]

Drinking water
Sanitation
Hygiene

Sanitation

National

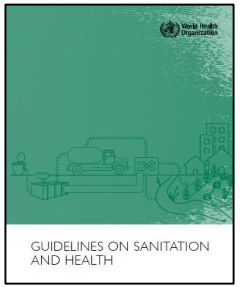
Source	Type	Year	Improved	Sewer	Septic	Latrines and other	Open defecation	Wastewater enters network	Wastewater reaches treatment plant	Septic: contained	Septic: not emptied	Septic: emptied and buried onsite	Septic: emptied and discharged locally	Septic: emptied and removed offsite	Septic: delivered to treatment plant	Latrines: contained	Latrines: not emptied	Latrines: emptied and buried onsite	Latrines: emptied and discharged locally	Latrines: emptied and removed offsite	Latrines: delivered to treatment plant	Treated at wastewater treatment plant	Treated at faecal sludge treatment plant	Shared
ESPS06	Survey	2006																						
IBNET07	Other	2007																						
IBNET08	Other	2008																						
IBNET09	Other	2009																						
MIS09	Survey	2009																						
IBNET10	Other	2010																						
IBNET11	Other	2011																						
ESPS11	Survey	2011																						
DHS11	Survey	2011																						
IBNET12	Other	2012																						
IBNET13	Other	2013																						
DHS13	Survey	2013																						
CEN13	Census	2013																						
DHS14	Survey	2014	65	5	13	47	15																	21
EE14	Survey	2014									[46]	[0]	[19]	[34]			[46]	[0]	[19]	[34]				
SDE14	Other	2014																						
DHS15	Survey	2015	62	6	25	31	14																	23
SDE15	Other	2015																						



Senegal, 31 data sources 2000-2015

Safely treated and disposed of in situ

Normative guidelines (Guidelines on Sanitation and Health, 2018)



- Pit latrines
  - Proper design
    - Depth to groundwater
    - Distance from water point
  - Treatment in situ
    - 1-2 years storage: safe to handle
    - Twin pit alternating
    - Arborloo
    - Cover & abandon
- Septic tanks
  - Proper design
    - Impermeable tank
    - Baffles
    - Two chambers, access
  - Effluent line
    - Leach fields, soak pit
    - Sewer connection
  - Regular emptying

Safely treated and disposed of *in situ*

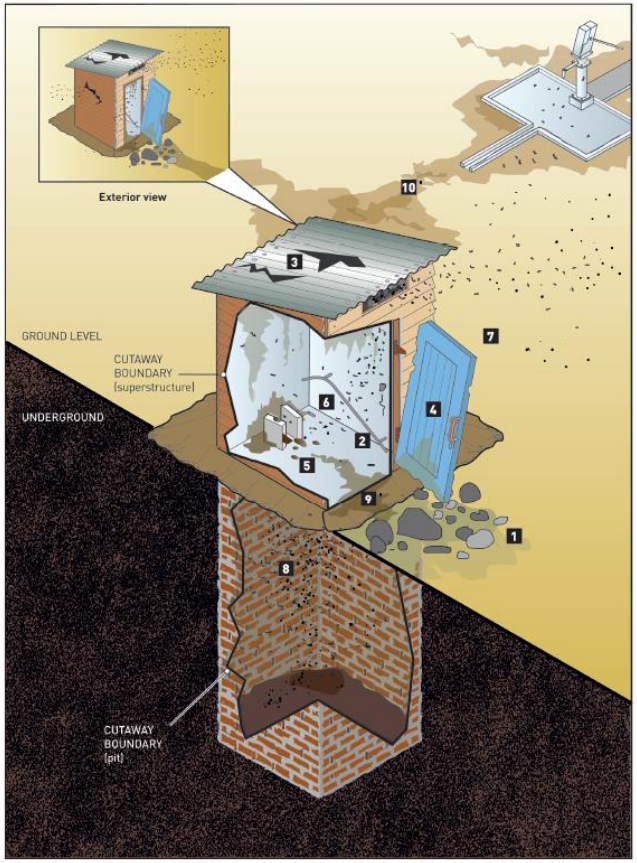
WHO UNICEF JMP

SDG monitoring

- Containment
  - Can be measured
    - Ireland
    - Sanitary Inspections
  - Otherwise assume
    - Full containment (latrines)
    - 50% containment (other)
- Emptying
  - From household surveys
  - Potentially service providers
- Never emptied → Safely treated *in situ*
  - India (rural): 30%
  - Bangladesh (rural): 32%
  - China (rural): 34%
  - Ecuador (rural): 50%

Sanitary Inspection forms, fact sheets

Sanitation inspection questions	
1	Is the access route to the toilet blocked or not manageable for some intended users? The elderly, disabled or sick may need a clear path or a ramp to gain access to the toilet, if it isn't or the route is blocked, some users may practise open defecation.
2	Are the handrails in the toilet room absent or loose? The elderly, disabled or sick may need handrails to use the toilet.
3	Is the toilet superstructure absent or damaged such that it does not prevent the ingress of rainwater, or prevent animals, rodents and insects from entering the toilet room and/or pit? Rainwater ingress may cause the pit to fill up and overflow, while animals, rodents and insects can damage the facility and can also carry excreta to the community.
4	Is the toilet door absent, broken or not lockable and/or the light does not work? A lockable toilet door and working light will help to provide privacy and security for the intended users.
5	Is the toilet dirty with excreta visible on surfaces? If it is not kept clean, the intended users could be exposed to excreta when using the toilet.
6	Are the anal cleansing facilities absent, inappropriate for the intended users, or insufficient? If culturally appropriate facilities are not provided, users could be exposed to excreta.
7	Are the handwashing facilities absent, or insufficient for the intended users? If culturally appropriate facilities are not provided, users could be



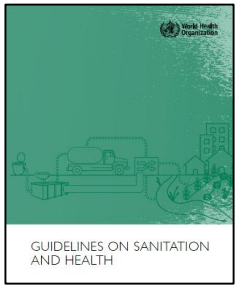
Recommended questions for household surveys

S4. Emptying of on-site sanitation facilities			
Has your (pit latrine or septic tank) ever been emptied?	Yes emptied	1	>>S5
	Never emptied	2	>>H1
	Don't Know	98	>>H1

S5. Disposal of excreta from onsite sanitation facilities			
The last time it was emptied, where were the contents emptied to?	**Removed by service provider**		
	to a treatment plant	1	>>H1
	buried in a covered pit	2	>>H1
Was it removed by a service provider?	to don't know where	3	>>H1
	Emptied by household		
	buried in a covered pit	4	>>H1
	to uncovered pit, open ground, water body or elsewhere	5	>>H1
	Other (specify)	6	>>H1

Emptied and treated off-site

Normative guidelines (Guidelines on Sanitation and Health, 2018)



- Limit exposure during conveyance
  - To sanitation workers, communities, consumers
- Regulation of emptying and transport services
  - Mechanised emptying and transport

- Technologies for treatment
  - Dedicated treatment plants
  - Co-treatment with sewage
  - Compliance with effluent standards

Emptied and treated off-site

SDG monitoring: what reaches treatment plants?

- Households
  - Has it ever been emptied?
  - Who did the emptying?
  - Where were the contents emptied to?
- Administrative records: how much is collected, how much is delivered?
  - Desludging services
  - Faecal sludge treatment plants
  - Wastewater treatment plants that receive faecal sludge
  - Regulators

Emptying in urban Thimphu

SDG monitoring: what reaches treatment plants?

- 11 treatment plants in Bhutan
  - 71% of people using septic tanks live in cities with treatment
- Thimphu: household survey
  - 74% of tanks ever emptied
  - 50% at least once per year, 25% never
  - Emptying arranged by landlords not renters

- Good records from municipal truck operators
  - 14% of septic tanks emptied per year, usually 2 trips per truck
  - Reportedly discharged into sewer lines. WWTP not designed for FS.
  - Trucks spend half of their trips unblocking sewer lines

Emptied and treated off-site

SDG monitoring: what is “treated” enough?

- Sewage treatment plants: secondary treatment or better
  - SDG target 6.2: Nominal treatment
  - SDG target 6.3: Effluent compliance
- Faecal sludge treatment plants: solids and liquids
  - Liquids: secondary treatment or better
  - Solids: typology not as clear
- Reuse?
  - SDG target 6.2: not included
  - SDG target 6.3: included in text, additional reporting indicator

2019 update underway

WHO UNICEF JMP

2017 report:

- 4727 datasets (2000-2016)
- 84 national estimates SMS
- 118 for sewage treated
  - 481 datasets
- 78 for treated and disposed of onsite
- 2 for emptied and treated
  - 29 datasets on FST

2019 report (draft):

- 5715 datasets (2000-2018)
- 90 national estimates SMS
- 204 for sewage treated
  - 666 datasets
- 94 for treated and disposed of onsite
- 9 for emptied and treated
  - 57 datasets on FST

Monitoring Safely Managed On-Site Sanitation Systems

WHO UNICEF JMP

SMOSS: new JMP project to improve & standardize methods and tools

- Aggregate data
  - From city to country
- Inception phase (2019)
  - Collect and review data collection tools
    - Treated and disposed of in situ
    - Emptied and treated
  - Expert Group Meeting
  - Select pilot countries
- Phase 1 (2019-2020)
  - Train pool of consultants
  - Test tools in 5 pilot countries
- Phase 2 (2020-2021)
  - Review and revise
  - Apply revised tools in 5 more pilot countries
  - Disseminate

washdata.org

WHO UNICEF JMP

https://washdata.org/data/household#!/dashboard/1976

WHO UNICEF JMP | DATA | REPORTS | MONITORING | HOW WE WORK | Search

Rank Chart

Geography: Rank c... | Region Type: SDG regions | Region: Sub-Saharan Africa

Measure

- (•) Coverage ( ) Population
- ( ) Percentage point change (2000 - 2015)
- ( ) Wealth inequalities (% pt difference richest vs poorest)

( ) Drinking Water (•) Sanitation ( ) Hygiene

Inequality

(•) Total ( ) Rural ( ) Urban

[ ] Poorest [ ] Poor [ ] Middle [ ] Rich [ ] Richest

Wealth quintile data only available for a subset of countries

Ladder Type

Analyse by service level | Analyse by facility type | Analyse by safely managed criteria

- [ ] Open defecation
- [ ] Unimproved
- [ ] Limited
- [x] Basic
- [x] Safely managed

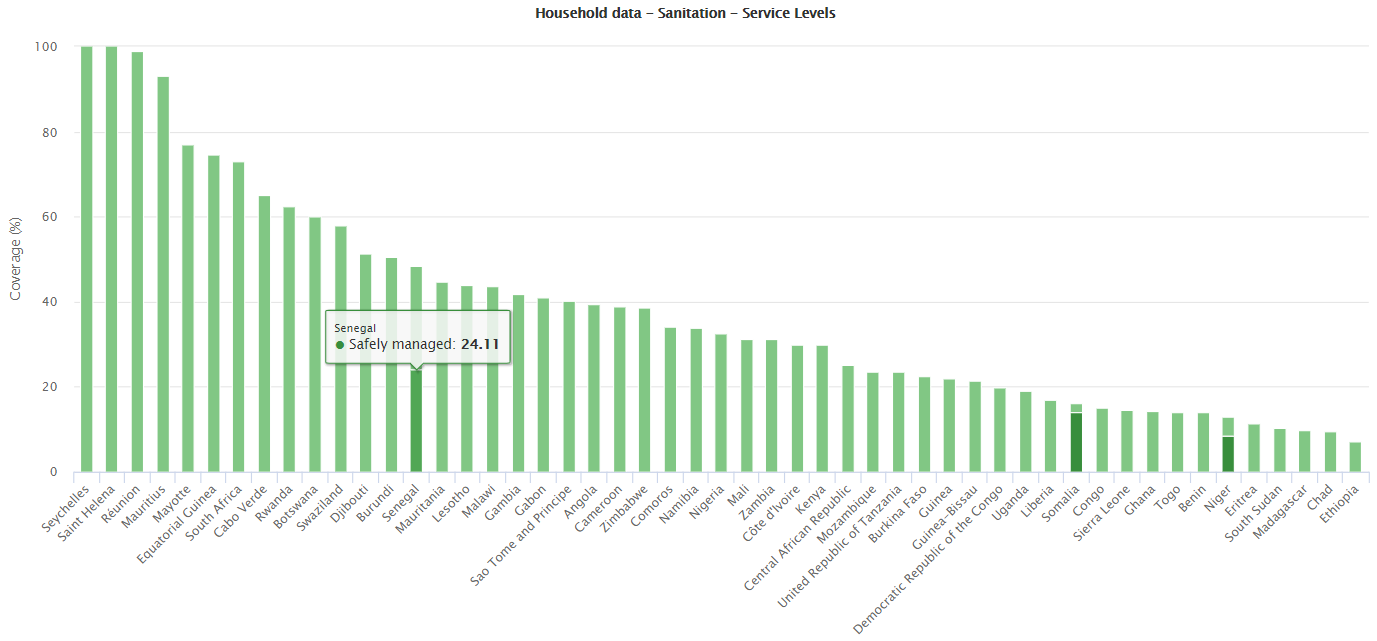
- [ ] Latrines
- [ ] Septic
- [ ] Sewer

- [ ] Disposed insitu
- [ ] Faecal sludge treated
- [ ] Sewage treated

Time period

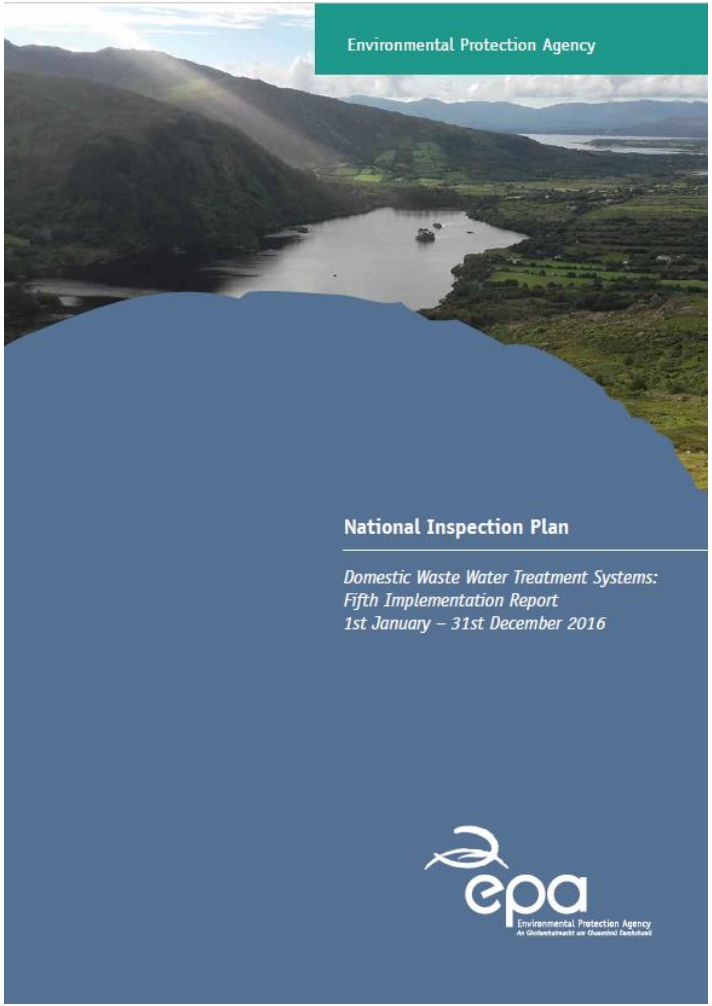
2015

Basic and Safely Managed Sanitation Services in sub-Saharan Africa



EDIT | EDIT IN NEW GRID

Extra slides if needed



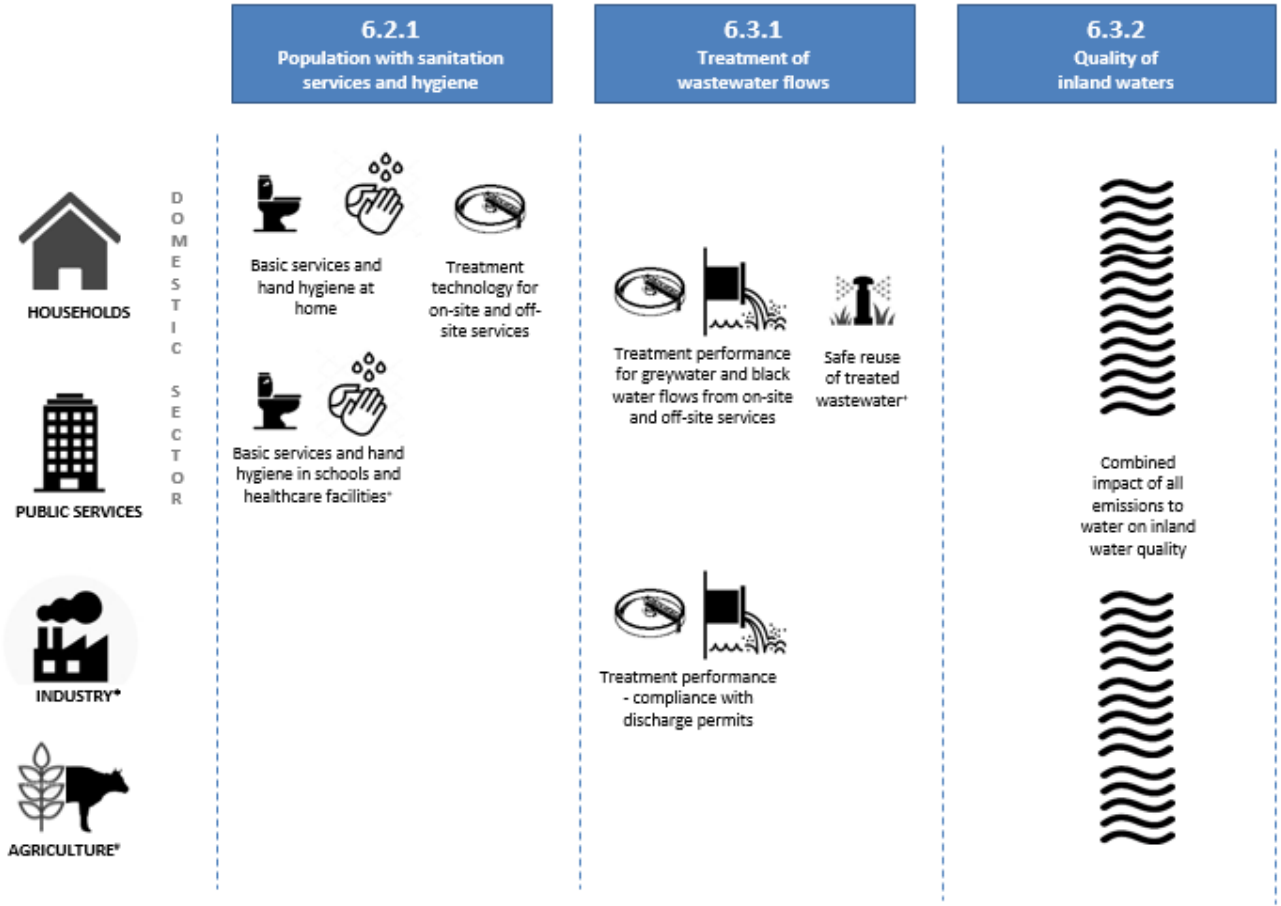
Inspections

Undertaken by local authorities

- The number of site inspections carried out (1,110) exceeded the minimum required by the EPA (1,000).
- Failures rates of DWWTS were up, with 49% of sites failing inspection in 2016, compared with 45% in 2015.
- 54% (294) of sites that failed inspection in 2016 are now compliant following remedial works.
- One re-inspection and 226 verification inspections were carried out in 2016.
- 23% of inspections were on unregistered sites.
- Sligo County Council did not undertake any new inspections in 2016.

Findings

- 29% of inspected systems failed due to operation and maintenance issues.
- 24% of inspected systems failed due to lack of desludging.
- 29% of inspected sites failed due to risk to human health or the environment.
- 299 of inspected sites had private drinking water wells on site; 51% of these systems failed inspection.



+ Includes point source agriculture
* diffuse sources

+ Supplementary reporting

6.3.1a

- *Indicator =*

(Volume ww safely treated) / (Volume ww generated)

- *Denominator:* Volumes of wastewater flows generated by all households (including greywater and blackwater if any)
  - Assume 120 lpcd for users of on-premises water
  - Assume 20 lpcd for users of off-premises water
  - Aim to get actual water usage numbers

6.3.1a

- *Numerator:* Volumes of wastewater flows that are
  - Transferred through sewers to a wastewater treatment plant where they are treated in compliance with national and local standards or
  - Released to an on-site system (septic tanks) that includes treatment compliant with national and local standards before discharge or
  - Released to an on-site system that is emptied and transported to a treatment plant where is treated in compliance with national or local standards

6.3.1a

- Preliminary estimates available for 79 countries
  - 62% is collected in sewers, 9% is collected in onsite facilities and the remaining 29% is not collected.
  - 59% of all domestic wastewater flows are collected and safely treated.
    - 76% of domestic wastewater flows collected in sewers are safely treated.
    - 18% of domestic wastewater flows collected in septic tanks are safely treated.
  - The untreated 41% presents risks to environment and health