Monitoring SDG 6.2 in Urban India

Exploring possibilities using City level PAS-SLB Information

January 2022

CWAS CENTER FOR WATER AND SANITATION | CRDF CEPT RESEARCH AND DEVELOPMENT FOUNDATION | CEPT UNIVERSITY

Acknowledgements

The 2030 Agenda for Sustainable Development called for 'ensuring availability and sustainable management of water and sanitation for all' under SDG 6. Safely managed sanitation services (indicator 6.2.1a) is an ambitious indicator under the target 6.2 . While the number of countries with estimates available for the safely managed sanitation has increased with each JMP progress update, many still only have a small number of data points making it difficult to assess trends.

India is one of the countries with the greatest progress in increasing at least basic sanitation and reducing open defecation, 2015-2020. Estimation of safely managed sanitation services in India is based on the small number of data points, the estimate of wastewater treated is based on the one-time study, whereas no estimates are available for fecal sludge emptied and treated. This slide deck describes the approach and assessment of safely managed sanitation services for urban areas, at the local level for a city and state. It is based on use of the performance assessment system (PAS) database at city level. It also provides a review of SDG monitoring in India and measures to strengthen monitoring system related to safely managed sanitation services.

The study was carried out under the project "Performance Assessment System for Urban Water Supply and Sanitation in India" funded by the Bill and Melinda Gates Foundation. It is based on the data in the online PAS module, and insights provided by 700+ cities in the three states of Gujarat, Maharashtra and Chhattisgarh in India. These cities are of various sizes, ranging from 2000 to 13 million population, diverse geography and varied levels of development.

We hope this slide deck provides an overview of how the PAS system can be used as a local level monitoring tool for estimation of safely managed sanitation services (SDG 6.2). These results, can help guide city and state officials for local level actions / measures to improve safely managed sanitation service levels.

Meera Mehta and Dinesh Mehta
Executive Directors, Centre for water and Sanitation
CRDF, CEPT University
Ahmedabad, India

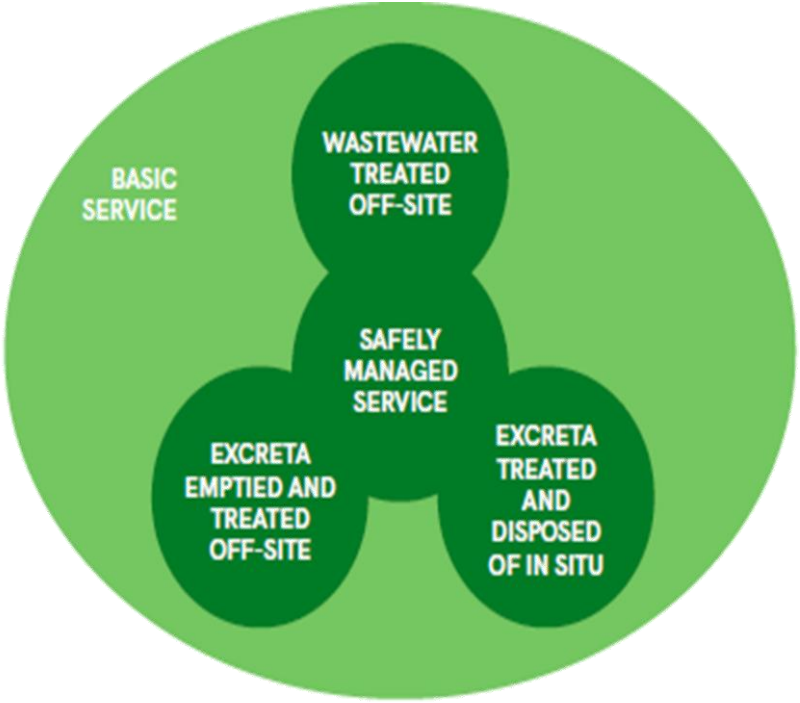
Contents

Contents

The new JMP ladder for sanitation services

Service Level	Definition	Data Sources
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	New data on emptying, disposal and treatment of excreta
BASIC	Use of improved facilities that are not shared with other households	Existing data on infrastructure type and accessibility
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	

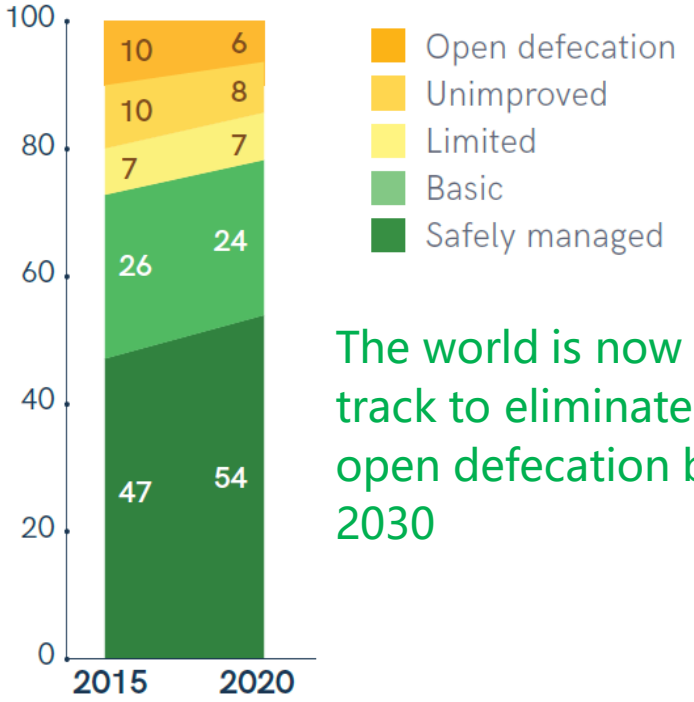
Note: improved facilities include flush/pour flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, composting toilets or pit latrines with slabs.



Source: WHO/UNICEF JMP (2017)

Progress on eliminating open defecation - world

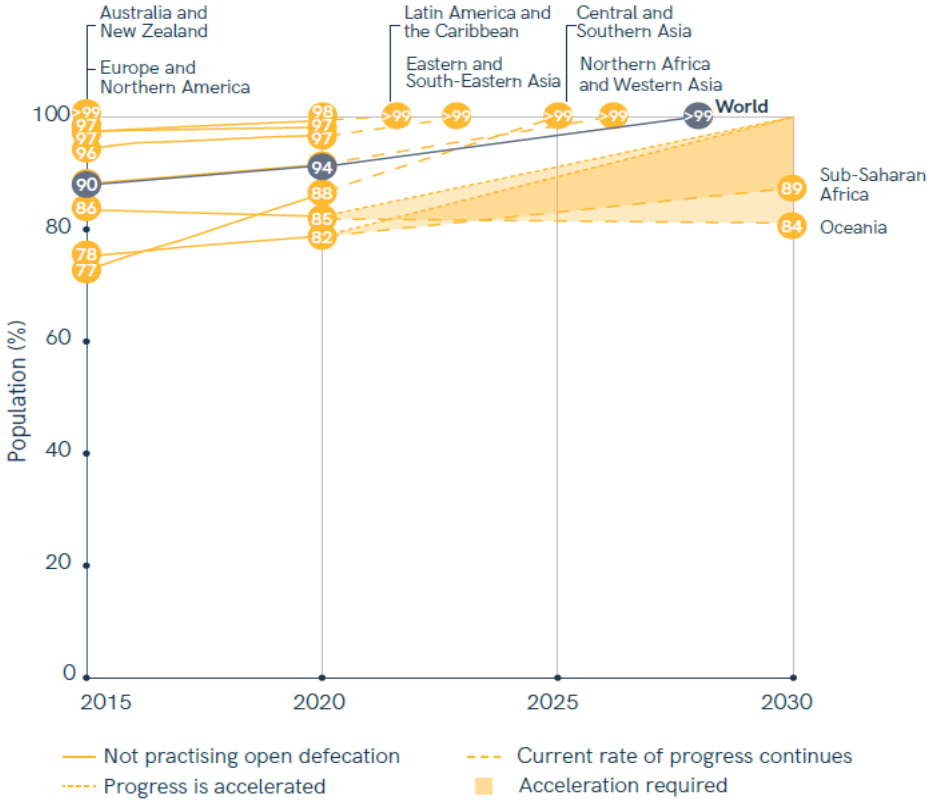
Global sanitation coverage, 2015- 2020 (%)



The world is now on track to eliminate open defecation by 2030

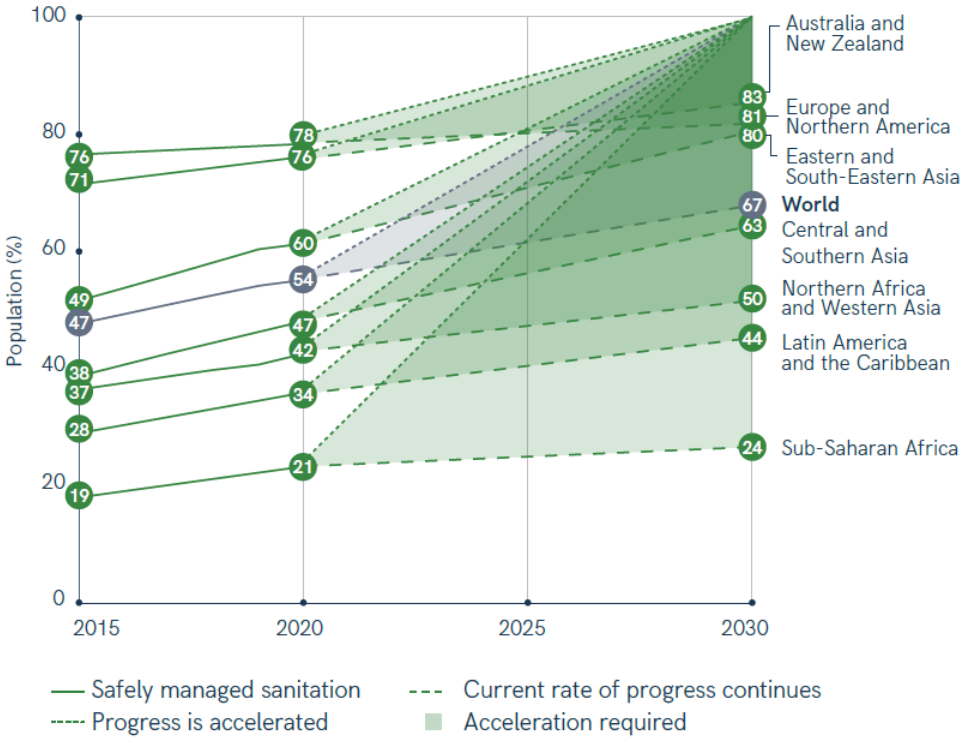
Source: JMP report on Progress on Household Drinking Water, Sanitation and Hygiene, 2000-2020, p. 9 and 64

Progress in eliminating open defecation, 2015 – 2020, and acceleration required to reach universal coverage by 2030



Progress in safely managed sanitation - world

Progress in safely managed sanitation services, 2015 – 2020 (%), and acceleration required to reach universal coverage by 2030



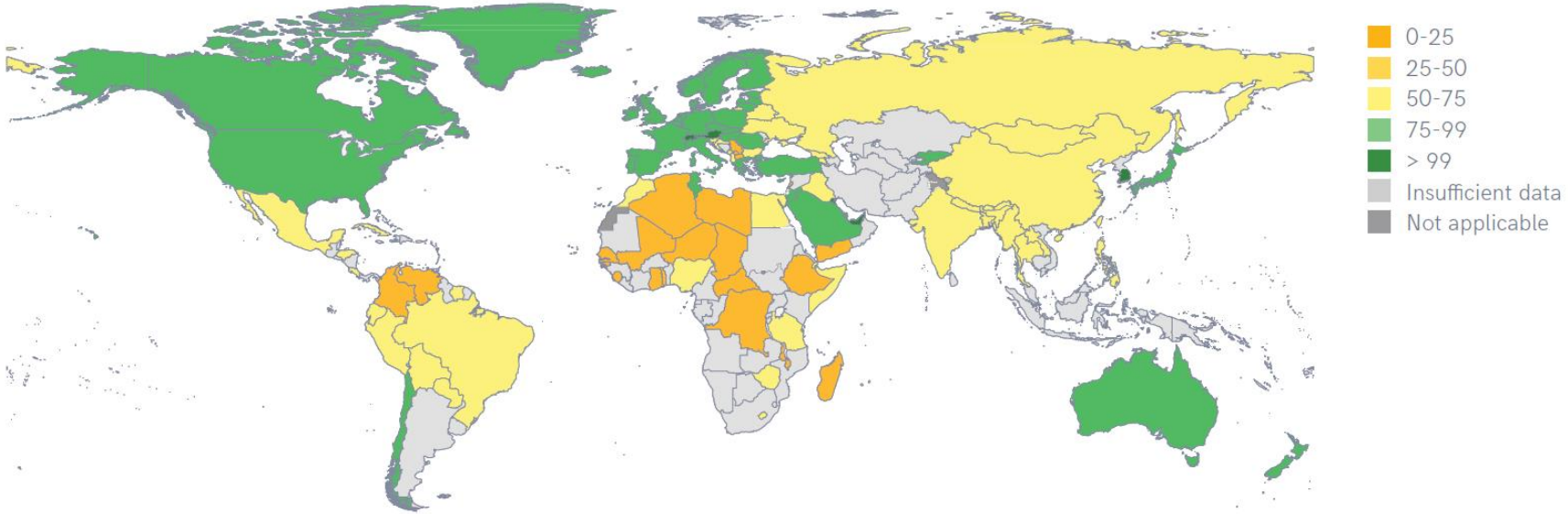
No SDG region is on track to achieve universal access to safely managed sanitation services by 2030

- In 2020, **34%** of the global population had **safely managed sanitation through sewer connections**, while **20%** had **safely managed on-site sanitation** facilities (including septic tanks and improved latrines) that were treated and disposed of in situ.
- For the first time, **more people used on-site sanitation technologies than sewer connections.** This signals a need for strengthening systems for monitoring safe management of on-site sanitation systems, and for investing in formal services for emptying, removal, and treatment of faecal sludge.

Source: JMP report on Progress on Household Drinking Water, Sanitation and Hygiene, 2000-2020 , p. 52 - 54

Status of safely managed sanitation services - world

Proportion of population using safely managed sanitation services, 2020 (%)



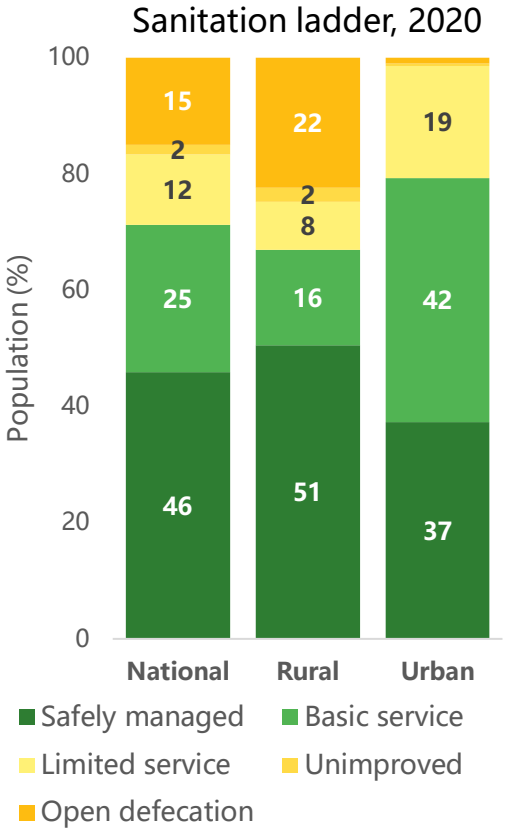
Data coverage for safely managed sanitation services has steadily increased.

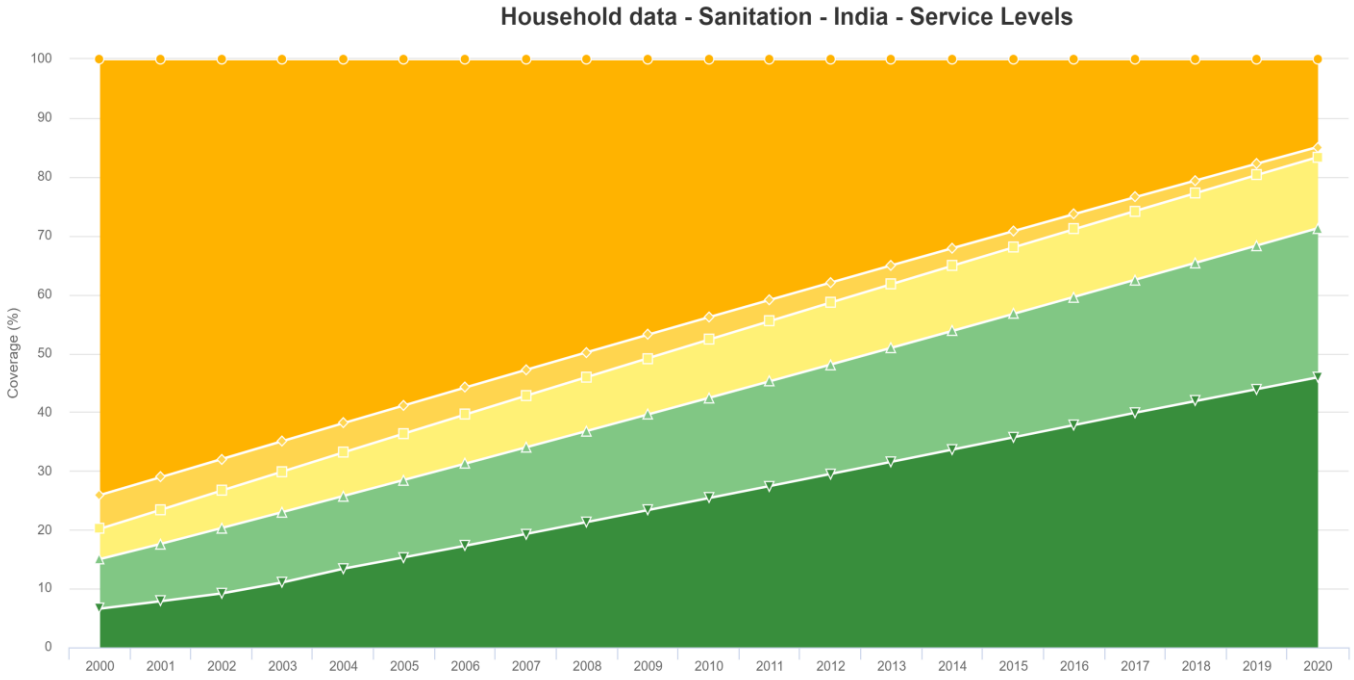
Year 2020 - 120 countries (representing 81% of global population)
Year 2017 - 92 countries (representing 54% of global population)
Year 2015 – 84 countries (representing 48% of global population)

The increase in data coverage has come mainly in low and middle-income countries where on-site sanitation is widespread, and **new questions included in household surveys have collected data on pit-emptying practices**. **There was insufficient data to estimate the global population with excreta removed and treated off-site**.

Source: JMP report on Progress on Household Drinking Water, Sanitation and Hygiene, 2000-2020, p. 59

Progress on household sanitation - India



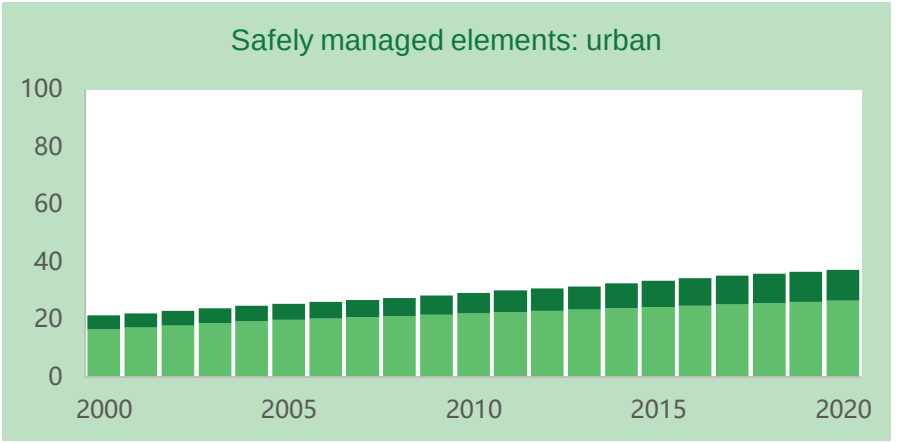


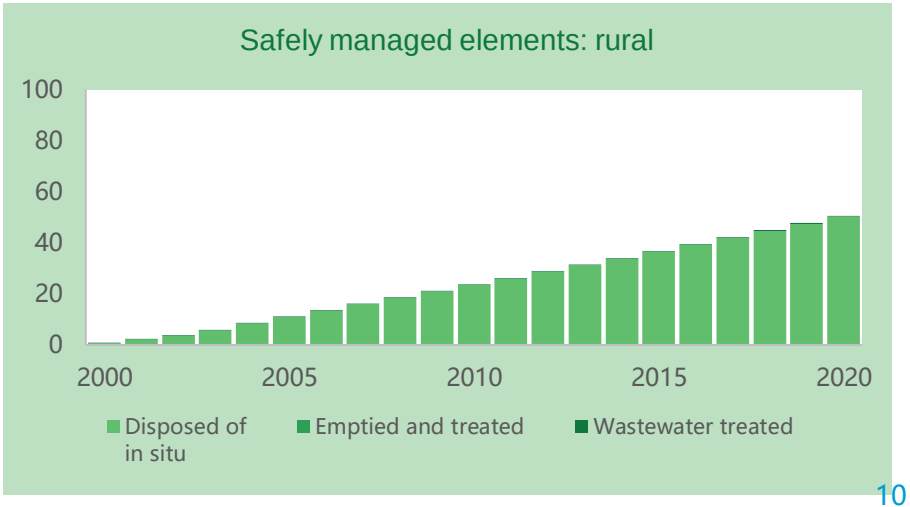
- India is responsible for the largest drop in open defecation since 2015, in terms of absolute numbers.
- It is one of the countries with the greatest progress in increasing at least basic sanitation, 2015-2020

Source: WHO/UNICEF JMP (2021), https://washdata.org/data/household#!/ , accessed on Oct 30, 2021.

Safely managed sanitation services in India - 2020

- Estimates for **disposed of in situ** is based on the **National Sample Survey** (NSS) 76th round: Drinking Water, Sanitation, Hygiene and Housing condition.
- Estimates for **wastewater treated** is based on the **study** of "Inventorization of sewage treatment plants" conducted by **Central Pollution Control Board** (CPCB) in the year 2015.
- As per "Faecal Sludge and Septage Management in Urban Areas: Service and Business models" report prepared by NITI Aayog, **more than 700 cities/towns are in various stages of FSSM** implementation. But **no estimates are available for fecal sludge emptied and treated.**





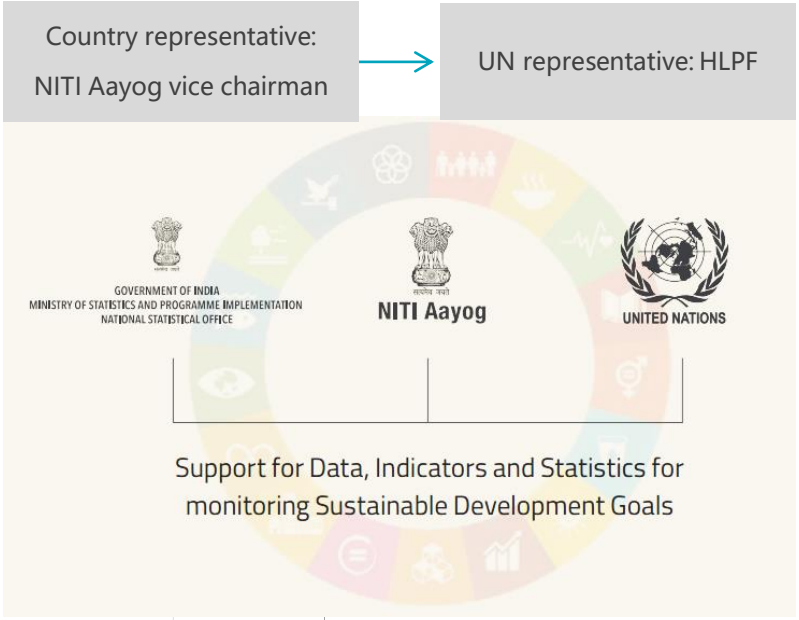
Source: WHO/UNICEF JMP (2021), https://washdata.org/data/household#!/

CWAS CENTER FOR WATER AND SANITATION | CRDF CEPT RESEARCH AND DEVELOPMENT FOUNDATION | CEPT UNIVERSITY

Contents

Institutional arrangements for SDG monitoring and reporting in India

- The responsibility for SDG monitoring is of the **Ministry of Statistics and Programme Implementation (MoSPI)**, Government of India and **NITI Aayog**.
- MoSPI has developed the **National Indicator Framework** (NIF) for **measuring the progress of the SDGs** and associated targets. NIF has been prepared in consultation with NITI Aayog, central ministries/ departments, states and other stakeholders, such as: the UN Agencies and civil society.
- MoSPI has also published a **guideline for development of State Indicator Framework** (SIF) for monitoring SDGs.

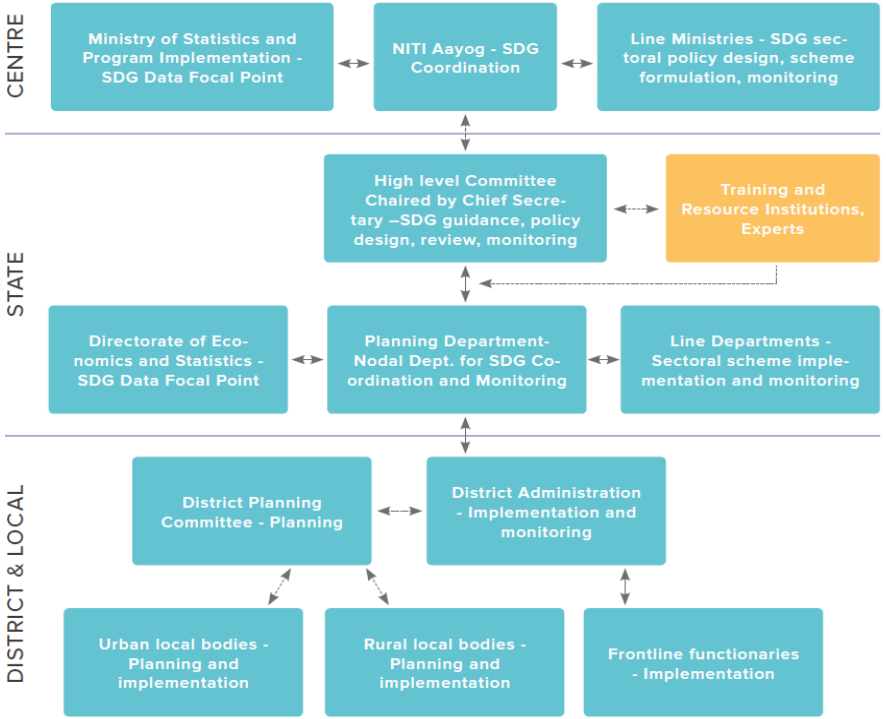


- NITI Aayog is facilitating and coordinating the implementation of SDGs in the country and undertaking comparative analysis of its achievement in the States and UTs.
- **NITI Aayog** has also **mapped various ongoing central schemes and responsible ministries against each sustainable development goal and related indicators**.
- State and local governments play a pivotal role in implementing development programmes. To reinforce the spirit of competitive good governance among the states and union territories, NITI Aayog has developed an SDG India index. And **published annual SDG India index to monitor progress at national and state level**.

Source: NITI Aayog.2020. VNR report retrievd from https://sustainabledevelopment.un.org/content/documents/26279VNR_2020_India_Report.pdf

Localisation of SDGs in India – at state and district levels (1/2)

"Localizing" is the process of taking into account subnational contexts in the achievement of the 2030 Agenda, from the setting of goals and targets, to determining the means of implementation and using indicators to measure and monitor progress.

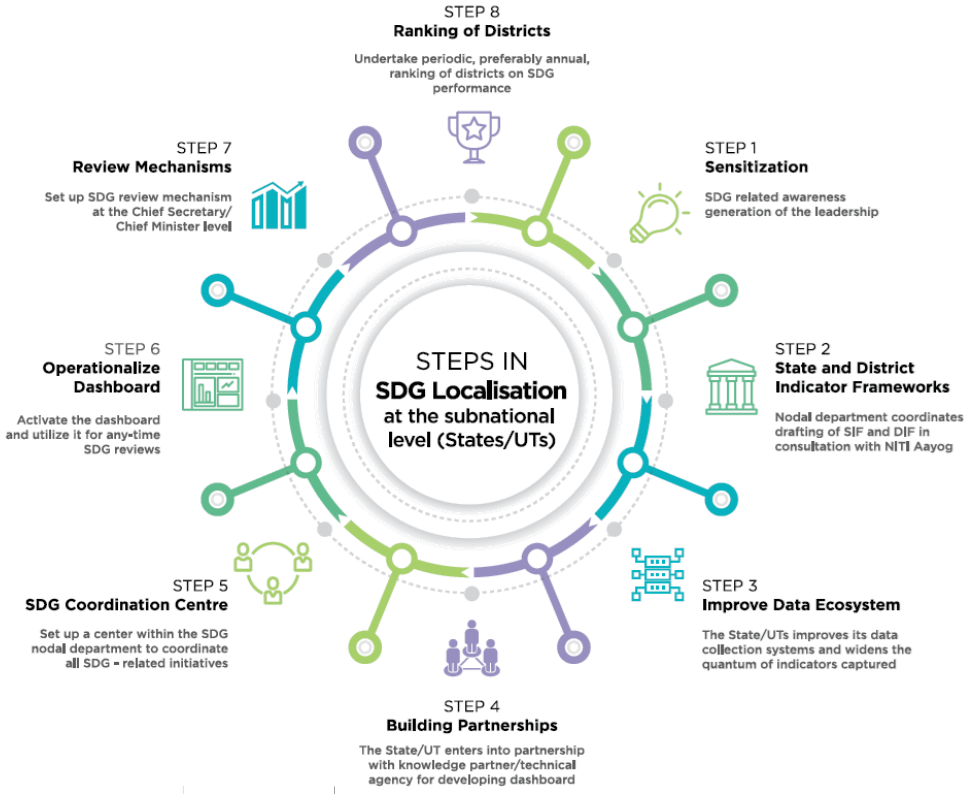


- **Planning, implementation and monitoring** of most of the functions related to Sustainable Development Goals are within **the mandate of state governments and local governments**. Localisation of SDGs is the responsibility of all the three levels of government.
- All line ministries that contributed to achieving specific results for each of the goals were also identified in the mapping and entrusted with the responsibility of achieving specific targets.
- NITI Aayog advocated with **States to prepare State level Vision documents and SDG Action Plans** aligned to SDGs, with 23 States and UTs having prepared their documents.
- Most States have formally identified the **Planning department as nodal departments for coordinating the SDG implementation process**. Several have also defined nodal structures within various departments.

Source: Global taskforce of local and regional governments; https://www.global-taskforce.org/localizing-global-goals; Localising SDGs – Early lessons from India 2019, NITI Aayog, pg. no 7 to 11.

Localisation of SDGs in India – at state and district levels (2/2)

Steps in SDG localisation at the subnational level



- Several States have gone further and established or **adapted even district level structures for taking SDG implementation and monitoring to the grassroots**.
- Many states have **gradually developed their State Indicator Frameworks** (SIF) for State level monitoring and tracking of progress. About 60 per cent of the States have developed SIFs, which significantly vary in terms of the number of indicators. They have been developed in consultation with all relevant stakeholders in the light of the broad national guidelines of Government of India.
- Similarly, the **States are in the process of developing District Indicator Frameworks** (DIFs). DIFs would enable addressing local aspirations and capturing details of ground level performance, with focused monitoring of indicators and goals at the grassroots. Presently, about 30 per cent of the States have brought out their DIFs.

Source: India VNR 2020 – Decade of action taking SDGs from global to local, NITI Aayog, pg. no 20 to 27.

Key challenges in monitoring the SDGs in India

NITI Aayog, India has identified the key challenges in the way of fully achieving the SDGs and has charted the way forward to address the roadblocks and achieve the goals and targets on time.

Key challenges related to monitoring of the SDGs are:

- "*The National SDG Indicator Framework (NIF) currently does not include indicators for 36 out of the 169 SDG targets. This is due to the fact that the statistical system, historically, has not been collecting data which correspond to some of the new challenges put forward by the SDG framework. For some indicators, a suitable methodology does not exist.* ***To ensure that the NIF is a comprehensive tool to monitor the whole of SDGs, the missing indicators will be identified or designed, following a consultative process, and added to the NIF****."*
- *"The NIF is a close-to-comprehensive set of indicators which reports on national-level data,* ***a sizable number of indicators do not present data at the State level****. This is a challenge to the SDG localisation model adopted by India."*
- *"With data in large quantity emanating from a variety of sources on a myriad of themes, it is imperative to focus on data quality. India already uses third-party independent surveys for data validation of some of its flagship schemes; the same approach shall be used for SDG data as well. Another strategy for improved data quality is the usage of modern tools and technologies of data collection such as tablets, mobile phones, and geospatial data". "A third strategy is to consider making use of citizen-generated data. India already has reputed citizen-related data collection and reporting initiatives, such as the Annual Status of Education Report (ASER) by Pratham, a non-profit organisation."*

Source: India VNR 2020 – Decade of action taking SDGs from global to local, NITI Aayog, p. 165 - 167

Overview of mapping of central schemes and ministries and review of missing schemes related to targets 6.2

- NITI Aayog has undertaken a mapping of various government schemes as they relate to the SDGs and their targets and has identified lead and supporting ministries for each target.
- In the updated mapping document published on August 2018, centrally sponsored schemes related to SDG 6 targets were not linked suitably. AMRUT schemes that provide thrust on provision of water supply connections and treatment of sewage and faecal sludge in cities were not covered for Targets 6.2.

SDG 6 targets	Centrally Sponsored Schemes and concerned ministries / departments – as per NITI Aayog mapping	Relevant Centrally Sponsored Schemes and concerned ministries not included in NITI Aayog mapping document
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	1. Swachh Bharat Mission (Rural), Drinking Water & Sanitation 2. Swachh Bharat Mission (Urban), Housing & Urban Affairs 3. Mission for Protection and Empowerment of Women, Women and Child Welfare and Panchayati Raj	AMRUT - Atal Mission for Rejuvenation and Urban Transformation, Housing & Urban Affairs

Source: Mapping of Central Sector Schemes and Ministries of Government of India (August, 2018), NITI Aayog, New Delhi. https://niti.gov.in/sites/default/files/2019-01/SDGMapping-Document-NITI_0.pdf, page no 20-21.

Aligning India's monitoring systems for targets 6.2 to global monitoring

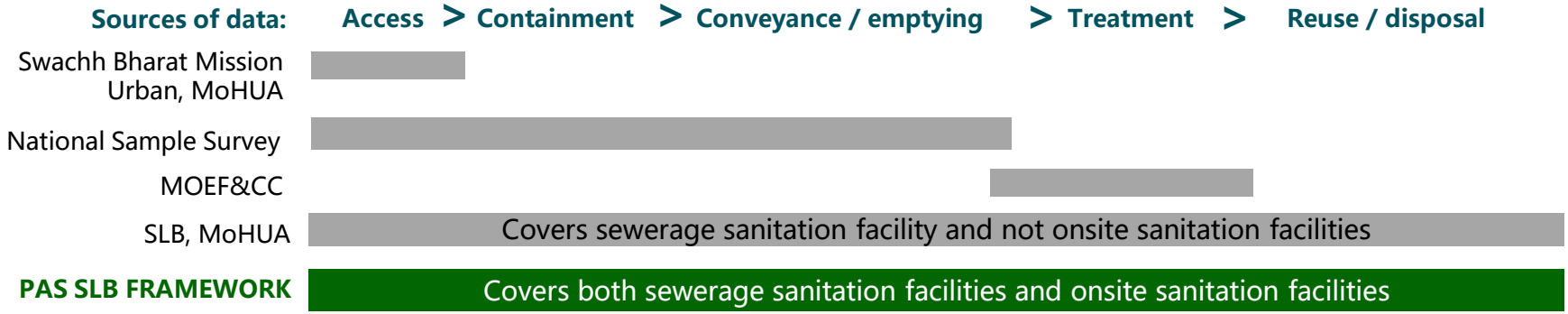
SDG Global target	6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
Global indicators	Indicator 6.2.1: The Proportion of population using (a) safely managed sanitation services (JMP 2020 values for India - 46%) (b) a hand-washing facility with soap and water (JMP 2020 values for basic handwashing facility in India – 68%)
SDG India index 2018 indicators and national target values	1. Percentage of rural households with individual household toilets (100%) 2. Percentage of districts verified to be ODF (100%) 3. Installed sewage treatment capacity as a proportion of sewage created in urban areas (%) (68.79%)
SDG India index 2019-2020 indicators and national target values	1. Percentage of rural households with individual household toilets (100%) 2. Percentage of urban households with individual household toilets (100%)* 3. Percentage of districts verified to be ODF (100%) 4. Proportion of schools with separate toilet facility for girls (100%)
SDG India index 2020-2021 indicators and national target values	1. Percentage of individual household toilets constructed against target (SBM(G)) (100%) 2. Percentage of districts verified to be ODF - SBM(G) (100%) 3. Percentage of schools with separate toilet facility for girls (95%)

- Globally, monitoring of Targets 6.1 and 6.2 is done by the UNICEF and WHO's Joint Monitoring Program (JMP). JMP derives trends from country level data and produces an annual report on the progress of SDGs for these two targets.
- JMP 2020 reports 46% safely managed sanitation and 71% basic sanitation service levels in India.
- NITI Aayog published SDG India index to monitor progress at national and state level. In these reports, **indicators used for monitoring targets of SDG 6.2 mainly focus on access to toilets (number of new toilets built against the targets). However, indicators related to excreta management and the full service chain are not included.**
- **Beyond the data on individual toilets, information on improved sanitation and excreta management (treated, disposed on site or stored and then emptied and treated) will be required to calculate safely managed sanitation service to align better with the global definition.**

Source: WHO/UNICEF JMP (2021), https://washdata.org/data/household#!/
SDG India index base line report 2018, NITI Aayog, page no 77, https://niti.gov.in/sites/default/files/2019-01/SDX_Index_India_21.12.2018_2.pdf
SDG India index and dashboard report 2019-20, NITI Aayog, page no 90 and 314, https://niti.gov.in/sites/default/files/SDG-India-Index-2.0_27-Dec.pdf
SDG India index and dashboard report 2020-21 (p. – 114), 2019-20 (p. 90) and 2018 (p. 77), NITI Aayog, http://niti.gov.in/reports-sdg

Need to shift from programme driven monitoring system to service level monitoring system – from local to state and national level

- Urban monitoring system is mostly based on the programme / mission driven. Therefore, data sets related to missions are captured periodically.
- Service level benchmarks initiative of MoHUA covers the performance assessment of sanitation service but focus mainly on sewerage system.
- Most of the available sanitation data sets are fragmented and not covered the entire service chain and all types (sewerage and onsite) of sanitation systems.
- PAS system captures the performance of onsite sanitation along with sewerage system across sanitation service chain. It works at local to state level and can be used at the national level. It will help in localizing the SDG and for use by state, district and at city level to assess and chart the progress over time.



PAS-SLB+ framework used in India, captures both sewerage and onsite sanitation service levels in cities

Revised sanitation assessment framework: San-benchmarks

It captures performance across sanitation service chain covering sewerage as well as onsite sanitation system in cities.

Framework applicable for all size of urban areas

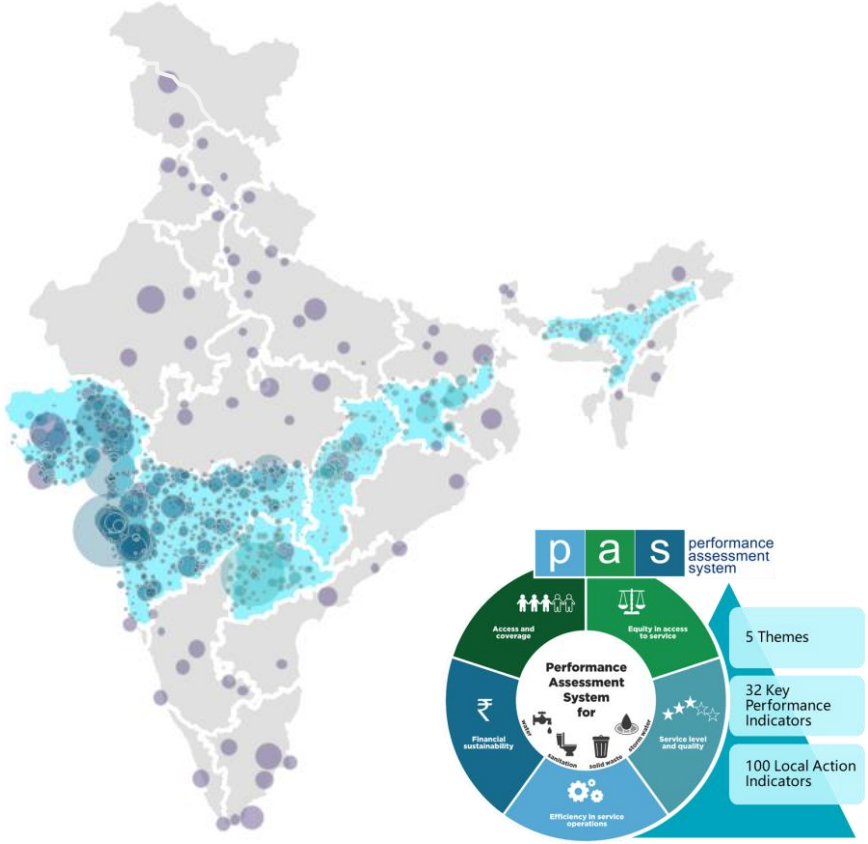
Framework is used by various size of cities, ranging from 5,000 to 5 million population.

Framework focusing on equity

Covers indicators related to access to water and sanitation services in slum areas

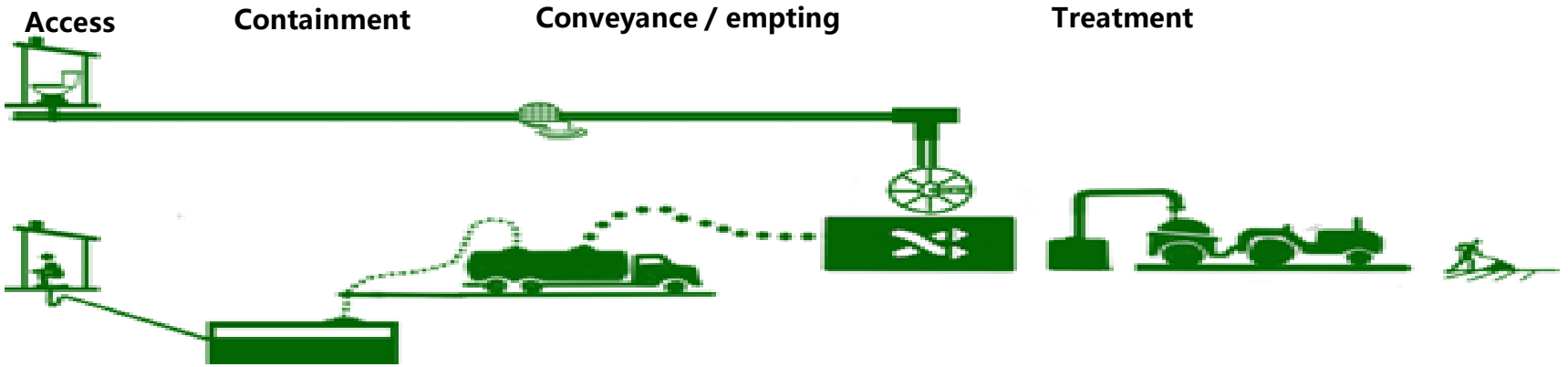
Nationwide presence

PAS-SLB online system is used by 1000+ cities of various states with diverse geography and varied level of development.



Contents

Use of PAS indicators and data to estimate safely managed sanitation



PAS data elements for calculation of basic and lower service levels

Households with individual toilets either connected with

- Sewerage system
- Septic tank
- Single pit
- Other safe system like twin pits, ecosan toilets, etc.

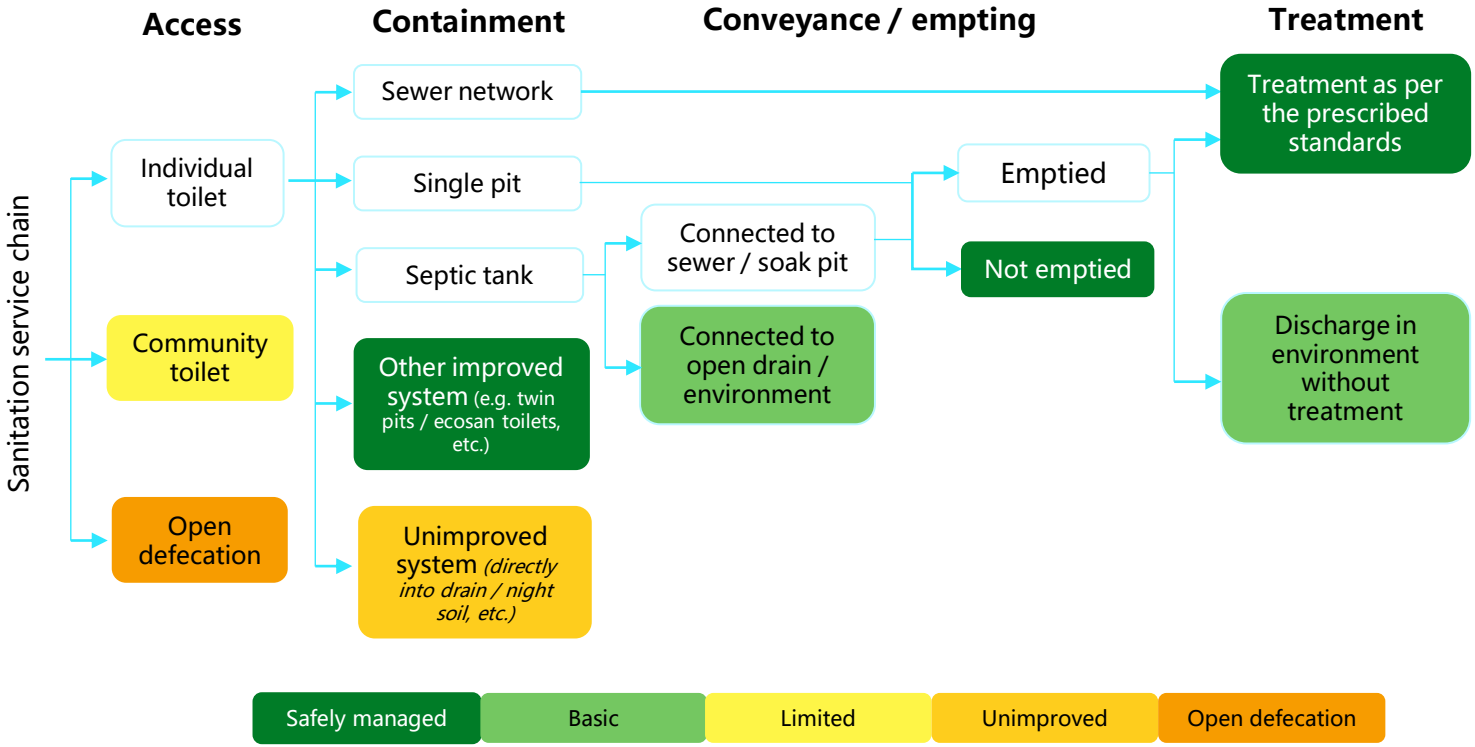
Households dependent on functional community toilets

Households with toilets connected to unsafe system like pit without slab, night soil disposal, bucket toilets, etc.

Households without individual toilets (improved / unimproved) and even not dependent on functional community toilets

Safe Management of Excreta Methods	PAS Indicators
Excreta transported through piped system and treated at sewage treatment plant	• % of sewage treated at treatment plant • Quality of sewage treatment
Excreta emptied from septic tank*/pit using mechanised means, transported and treated at FSTP/ STP	• % of faecal sludge treated at treatment plant • Quality of faecal sludge treatment
Excreta not emptied from septic tank*/ pit and contained in the tank / pit	• % of septic tank / pit are not cleaned annually
Excreta contained and treated onsite	• % households with individual toilets connected to twin pits or safe systems such as ecosan toilets, Johkasou

Estimation methodology for sanitation service levels using PAS data



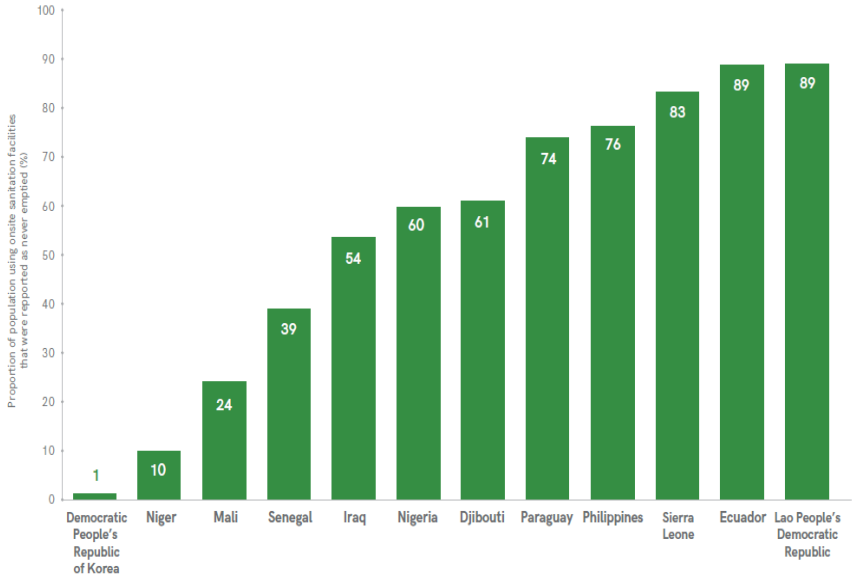
Estimation of safely managed sanitation:

- Sewerage safely conveyed and treated
- Fecal sludge in single pit or septic tank connected to sewer / soak pit safely emptied and treated
- Fecal sludge in single pit or septic tank connected to sewer / soak pit safely contained (not emptied)
- Other improved systems e.g. twin pits / ecosan toilets

Regular emptying of septic tanks for safely managed sanitation – 1/2

- As per JMP, emptying of onsite sanitation facilities varies widely among countries with data available.
- Irregular and delayed desludging can result in increased chances of accidental overflows of fecal matter from septic tanks to open drains. In addition, overflow of supernatant with pathogens leads to groundwater and surface water pollution and other adverse environmental impacts.
- A study by Gretsch et al. (2016) conducted in four low-income neighborhoods in Accra, Ghana, showed high levels of fecal contamination in open drains.
- Therefore, JMP should consider regular emptying also and assumption of septic tank never emptied as safely managed needs to review again.

Proportion of septic tanks and latrines never emptied and wastes disposed of in situ



Source: JMP report on Progress on household drinking water, sanitation and hygiene I 2000-2017, Special focus on inequalities p. 69

Mehta M, Mehta D and Yadav U (2019) Citywide Inclusive Sanitation Through Scheduled Desludging Services: Emerging Experience From India. Front. Environ. Sci. 7:188. doi: 10.3389/fenvs.2019.00188

Regular emptying of septic tanks for safely managed sanitation – 2/2

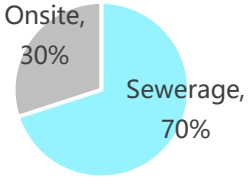
- Initial results from the zones of Wai and Sinnar cities (Maharashtra state, India) where scheduled desludging has been initiated, show that fecal coliform in open drains is below 100 MPN/100 ml.
- Regular desludging (ranges from 2 to 5 years) is recommended by several countries for the safe and proper functioning of septic tanks. Although, JMP is not considering the emptying frequency in estimation of safely managed sanitation.
- To ensure regular desludging, similar to solid waste collection services – public service, a planned efforts (scheduled desludging) is needed. This also helps improves health and safety practices by removing the need for manual cleaning; and achieves positive environmental impacts.
- Experience of scheduled desludging in Wai and Sinnar reveals that desludging fees as sanitation tax and linked to property tax or water bills are more acceptable to households. This also helps achieve equitable service by including the poor and low-income settlements; helps in cost optimization and thereby reduces payment burden.

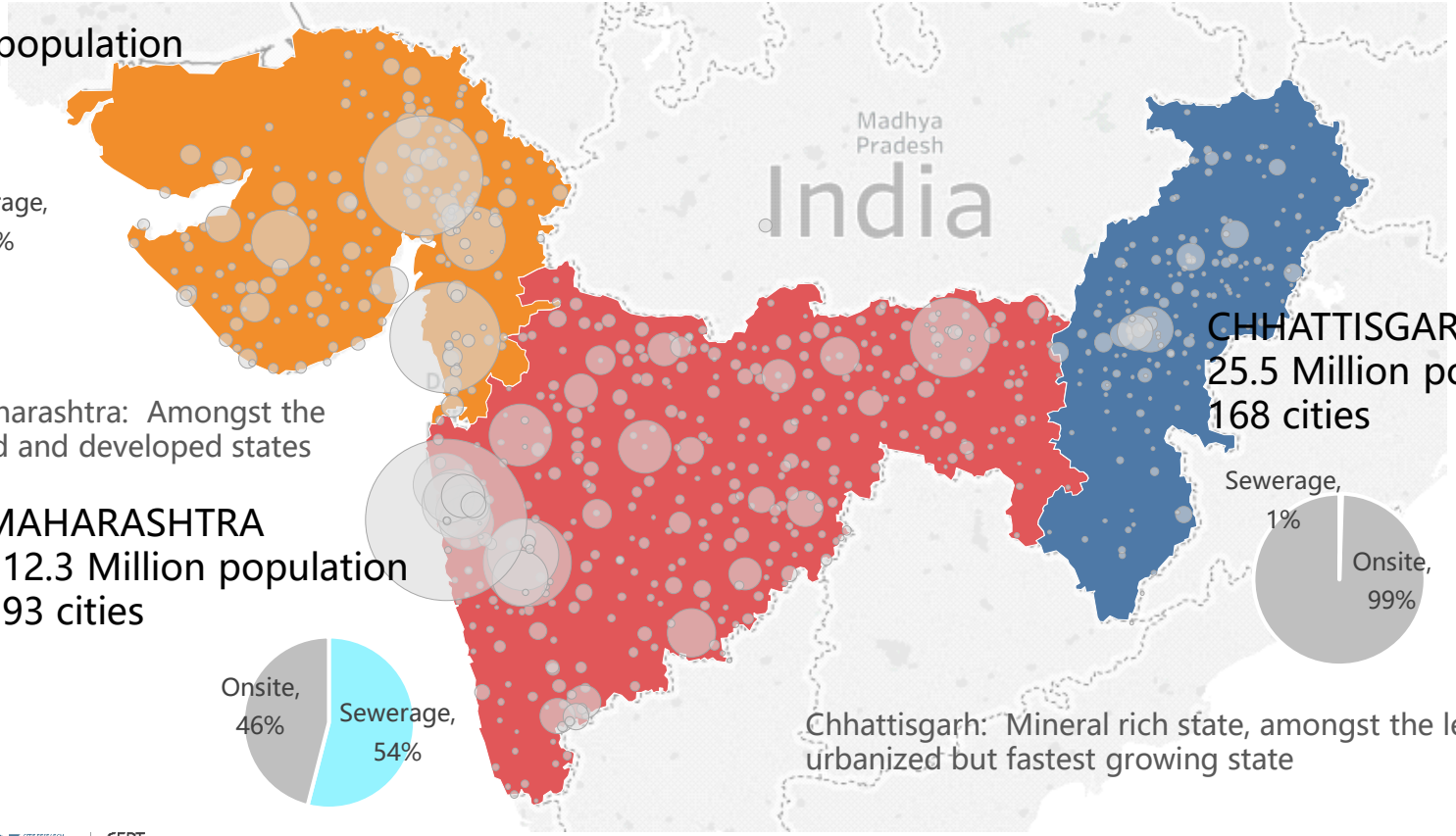
Source: Mehta M, Mehta D and Yadav U (2019) Citywide Inclusive Sanitation Through Scheduled Desludging Services: Emerging Experience From India. Front. Environ. Sci. 7:188. doi: 10.3389/fenvs.2019.00188

Contents

Estimating SDG 6.2 using PAS data – Overview of states

GUJARAT
60.4 Million population
170 cities





Gujarat and Maharashtra: Amongst the highly urbanized and developed states

MAHARASHTRA
112.3 Million population
393 cities

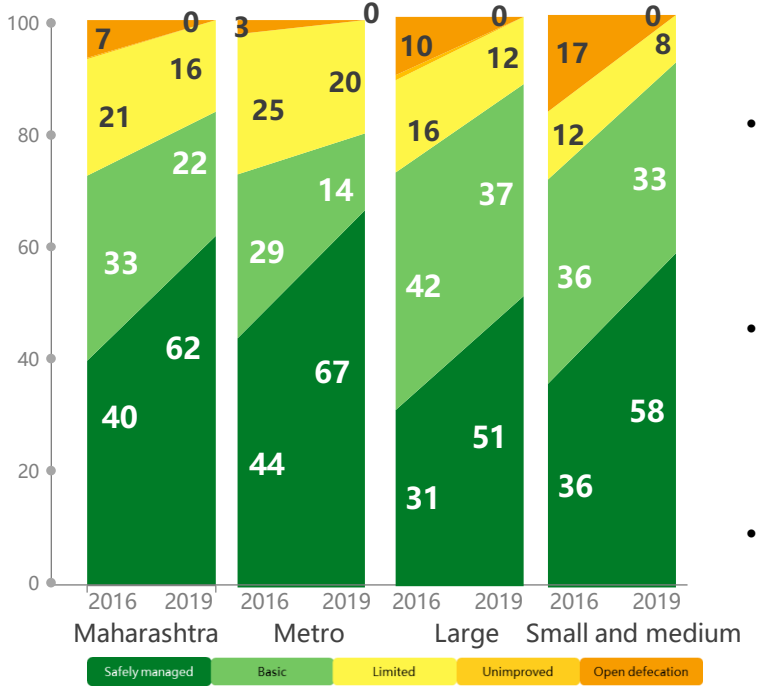
CHHATTISGARH
25.5 Million population
168 cities

Chhattisgarh: Mineral rich state, amongst the least urbanized but fastest growing state

Service gaps and actions for safely managed sanitation - Maharashtra

State sanitation coverage,

2016 – 2019 (%)



Metro Cities (Million Plus population)
Large Cities (1 to 0.1 million population)
Small and Medium Cities (less than 0.1 million population)

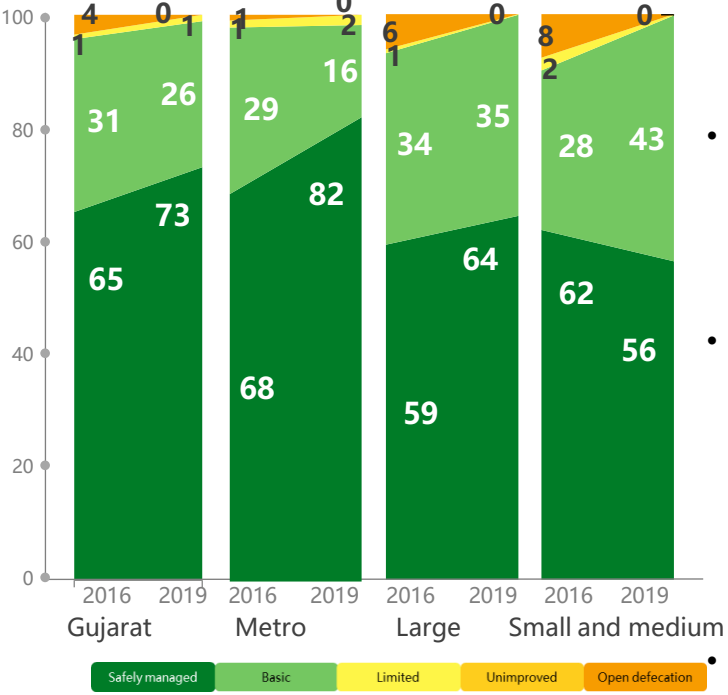
- **Maharashtra** state has a highest percentage (16%) of shared toilets as compared to other states in India.
- Metro cities have higher dependency on shared toilets as compared to small and medium cities. **Thrust is needed towards universal access to individual household toilets**.
- **Service gap** in **safely managed sewerage system** is only **5%** whereas gap in **safely managed onsite sanitation** (mainly in large, small and medium cities) is **17%**.
- In many cities, **outlet of septic tanks are connected to drain** and therefore excreta contained in the tank or emptied and treated are not considered as safely managed. Hence, **there is a need to improve containment system for supernatant along with treatment of fecal sludge**.

Estimated based on SLB-PAS 2016 – 2019 data provided by cities of Maharashtra

Service gaps and actions for safely managed sanitation - Gujarat

State sanitation coverage,

2016 – 2019 (%)



Metro Cities (Million Plus population)
Large Cities (1 to 0.1 million population)
Small and Medium Cities (less than 0.1 million population)

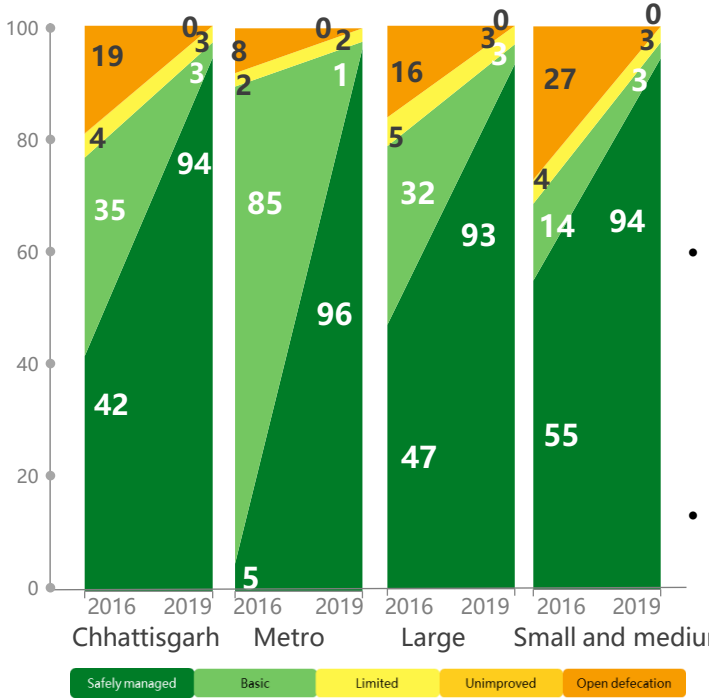
- Gujarat sanitation policies are inclined towards providing **individual toilets** and **sewerage system** in all the cities.
- Most of the **treatment plant projects** are **completed in metro and large cities** therefore safely managed sanitation services are improved in these cities.
- **Safely managed sanitation** services are **decreasing** in **small and medium** cities because many cities have **laid down the sewer network** but **treatment plants are yet not built** / functional. Hence safely managed through onsite sanitation system (contain in the tank) is decreased over a time.
- **Service gap** in safely managed **sewerage system is 25%** whereas gap in safely managed onsite sanitation is less than 2%. Need to focus on **building sewage treatment plant** in large, small and medium cities.

Estimated based on SLB-PAS 2016 – 2019 data provided by cities of Gujarat

Service gaps and actions for safely managed sanitation - Chhattisgarh

State sanitation coverage,

2016 – 2019 (%)

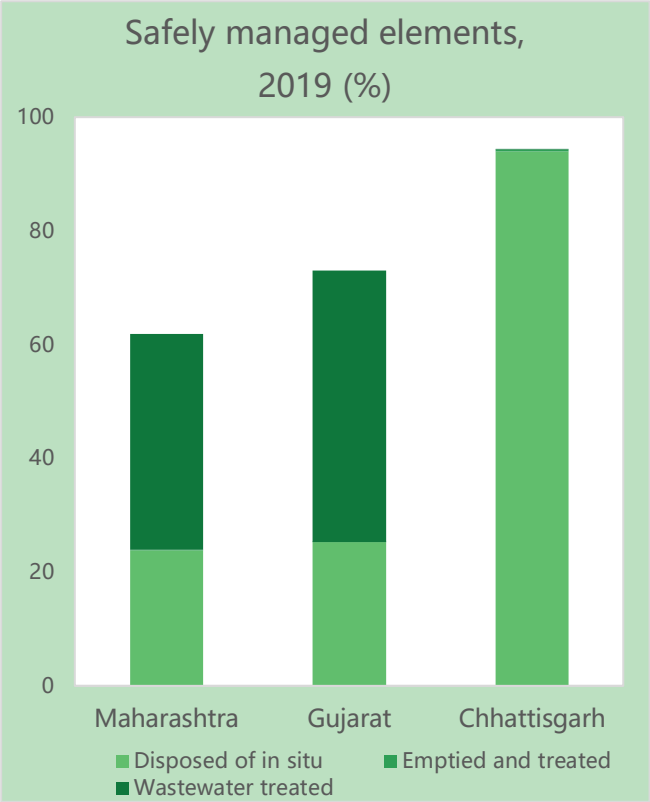


Metro Cities (Million Plus population)
Large Cities (1 to 0.1 million population)
Small and Medium Cities (less than 0.1 million population)

- As per census 2011, in urban areas, **Chhattisgarh** had the highest percentage of open defecation as compared to other states in India. State has **achieved ODF** status through **social and behavior changes along with construction of individual toilets**.
- All cities in the state are fully dependent on onsite sanitation system, except for Bilaspur (Large) city . Hence, state sanitation policies are focused on fecal sludge and septage management. More than 150 cities (90% of total cities) constructed the FSTPs in the last two years.
- Service gap in safely managed onsite sanitation is less than 3%. Most cities have build the fecal sludge treatment plant but **due to lower rate of desludging**, **fecal sludge emptied and treated** is **only 0.4% and major component is safely contained in the tank / pit. For effective functionality of onsite system, need to emptied the tanks regularly.**

Estimated based on SLB-PAS 2016 – 2019 data provided by cities of Chhattisgarh

Summary: Service gaps and actions for safely managed sanitation



Service gap is calculated by subtracting the safely managed sanitation value from basic sanitation achieved through sewerage / onsite sanitation systems

Maharashtra

- **Service gap** in safely managed sewerage system is only 5% whereas gap in safely managed **onsite sanitation is 17%**.
- In many cities, outlet of septic tanks are connected to drain and therefore excreta contained in the tank or emptied and treated are not considered as safely managed. Hence, there is a **need to improve containment system for supernatant along with treatment of fecal sludge**.

Gujarat

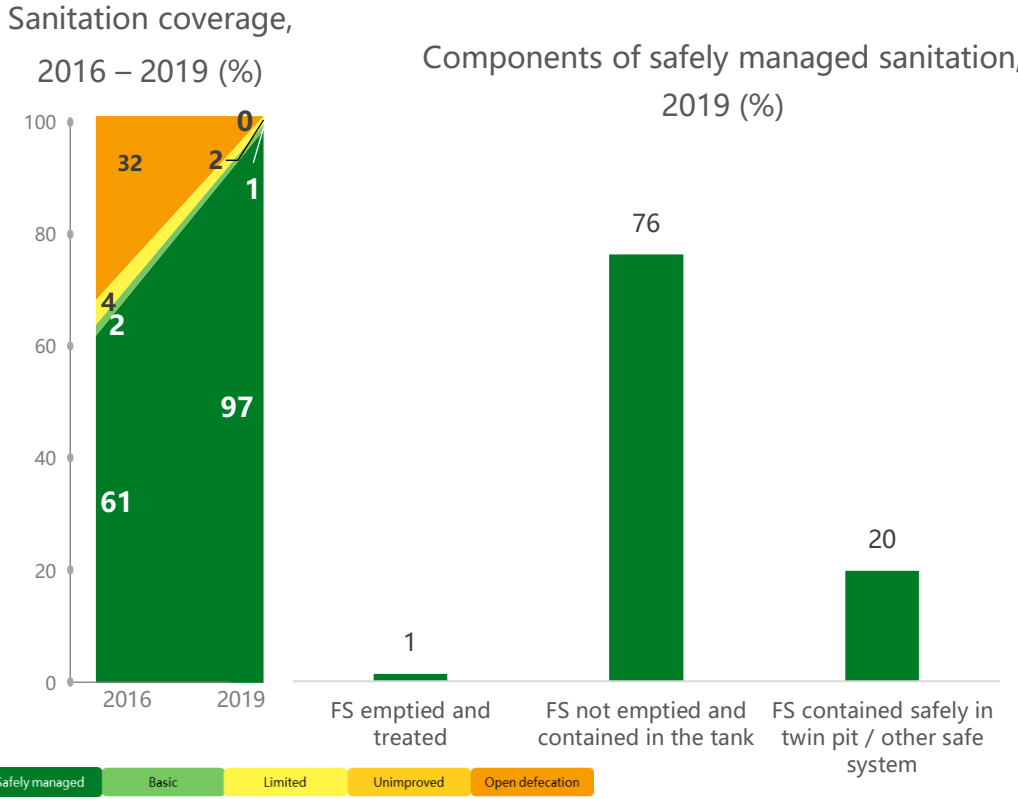
- **Service gap** in safely managed **sewerage system is 25%** whereas gap in safely managed onsite sanitation is less than 2%. Need to focus on **building sewage treatment plant** in cities.

Chhattisgarh

- Service gap in safely managed onsite sanitation is less than 3%. Most cities have built the fecal sludge treatment plant but **due to lower rate of desludging, fecal sludge emptied and treated is only 0.4%**.

Estimated based on SLB-PAS 2016 – 2019 data provided by cities of Maharashtra, Gujarat and Chhattisgarh states of India.

Estimation of safely managed sanitation – city example Ambikapur

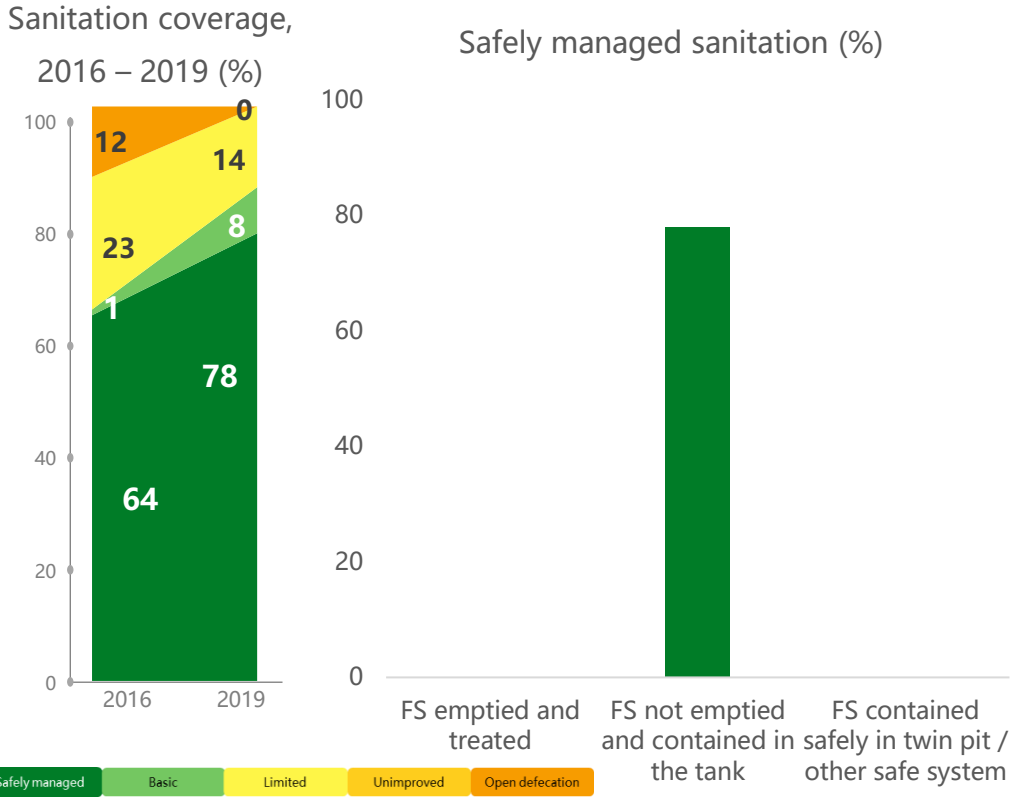


Ambikapur, Chhattisgarh state

- Population of city – 160 thousand
- Only 2% of households are using shared toilets.
- City is entirely dependent on onsite sanitation, septic tank connected to soak pit (79%) or twin pit system (20%).
- City has achieved 97% of safely managed sanitation
- Majority of excreta are not emptied and contained in the tank. Therefore, higher percentage is considered as safely managed sanitation.
- Emptied fecal sludge is treated in the FSTP.

Estimated based on SLB-PAS 2016 – 2019 data provided by cities of Maharashtra, Gujarat and Chhattisgarh states of India.

Estimation of safely managed sanitation – city example Sinnar



Sinnar, Maharashtra state

- Population of city – 82 thousand
- 14% of households are using shared toilets.
- City is entirely dependent on onsite sanitation. In onsite sanitation 95% septic tank are connected to soak pit and others are connected to open / closed drainage network
- City has achieved 78% of safely managed sanitation
- Majority of excreta are not emptied and contained in the tank. Therefore, higher percentage is considered as safely managed sanitation.
- FSTP was under construction and not operationalized until March 2019. And emptied fecal sludge was disposed of on land without treatment.

Estimated based on SLB-PAS 2016 – 2019 data provided by cities of Maharashtra, Gujarat and Chhattisgarh states of India.

Summary of measures to improve safely managed sanitation in Gujarat, Maharashtra and Chhattisgarh states (1/2)

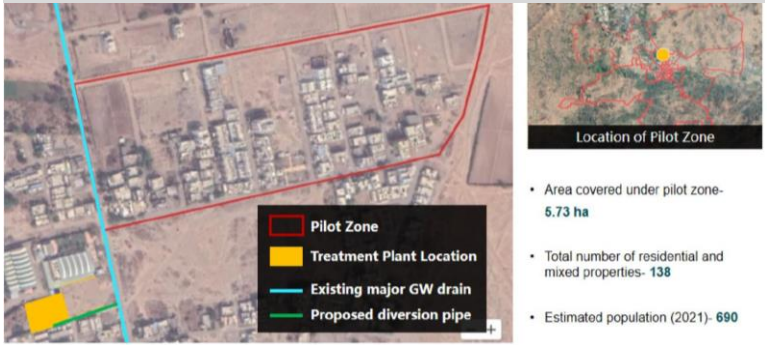
Access: Reduced dependency on community toilets by providing individual toilets with proper containment system, mainly in all cities of Maharashtra state and metro cities of Gujarat and Chhattisgarh states.

Public agencies often cite lack of space, finance and sewerage access as reasons for not being able to make individual household toilets available for the urban poor. "Reaching the Unserved-Access to individual household toilets in vulnerable urban areas" document is a compendium of cases which show how the perceived barriers to constructing individual household toilets have been successfully addressed.

Containment: Some cities have reported septic tank outlet is connected with the open drain. Therefore there is a need to **improve containment system / conveyance and treatment for supernatant**.

Example – ongoing initiative of greywater management through improved conveyance and treatment of supernatant and greywater in Sinnar city, Maharashtra. Most households in the pilot area have their septic tanks connected to soak pit while in a few cases the supernatant is discharged into the closed public drains. And these drains are then merged into open drains and ultimately in river Saraswati. Based on the quality tests and flow measurement in drains, various technology options were selected for treatment of supernatant and greywater. And diversion pipeline till treatment plant will be laid out for conveyance.

Demonstration of decentralised solutions for treatment of greywater including supernatant of septic tank



Summary of measures to improve safely managed sanitation in Gujarat, Maharashtra and Chhattisgarh states (2/2)

Conveyance / emptying: Most cities of Chhattisgarh state has lower rate of septic tank desludging. **For effective functionality of onsite system, need to emptied the tanks regularly.**

Central Public Health and Environmental Engineering Organisation (CPHEEO) of India recommends that septic tanks be emptied every 2/3 years. The new Swachh Bharat ODF+/++ protocol also mandates safe management of faecal sludge from all toilets particularly emptying of onsite sanitation structures atleast once in two years for a city to be declared ODF++. This is difficult to achieve for cities on a demand based model of desludging. The cities of Wai and Sinnar are the first cities in India to implement scheduled desludging of septic tanks for FSSM. Resources for implementing scheduled desludging document describes the steps required to implement such a service in a city.

Treatment: **Need to build sewage / fecal sludge treatment plant** (40% of total cities of Gujarat and a less than 1% total cities of Maharashtra where network is laid down but treatment plant is not build) **or fecal sludge treatment plant** (30% of total cities of Gujarat and 80% of total cities of Maharashtra).

Example of Maharashtra's FSSM strategy for effectively collection and treatment of human faecal waste in all cities. Faecal Sludge and Septage Management in Maharashtra document provides the brief description of a two-pronged approach: a) co-treatment of faecal sludge at own or nearby STPs, where feasible; and b) setting up faecal waste treatment plant (FSTP) at city level for faecal sludge treatment. Guidelines for FSTP operation and maintenance have also been developed.

Contents

Measures needed to strengthen monitoring system and address data challenges

Based on the experience of working with cities in the state, major challenge for monitoring safely managed sanitation is availability of onsite sanitation data. Common challenges and its improvement measures are:

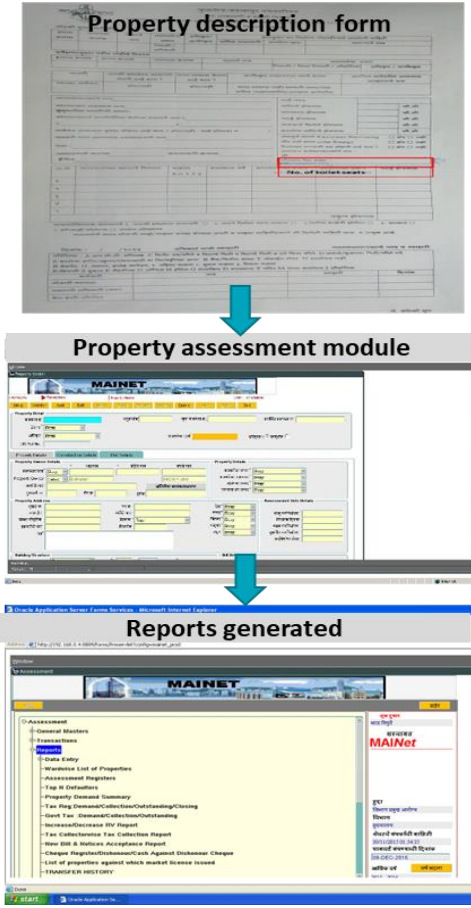
Challenges	Measures
• User interface: Lack of recorded **information on household level access to onsite sanitation system:** Households with septic tank, no of septic tanks connected to soak pit, to well managed covered drains, etc. • **Septage collection**: When emptying services are provided by private operators, data is not always available with city. • Treatment: **Quantity of septage treated** in existing sewerage treatment plant	• Currently estimated based on knowledge of city officials. Can be improved by **addition of onsite sanitation related question in property tax assessment system** • **Provide license to private operators** and need monitoring mechanism • **Maintain record at sewage pumping station and treatment plant** for septage received and treated

Strengthen onsite sanitation data base – link with property tax data base in city

- Usually, the information on service provided by cities is fairly reliable (e.g water connection, sewage connection, etc.). However, information on onsite system is weak as cities typically do not collect information on toilets connected to septic tanks or pits.

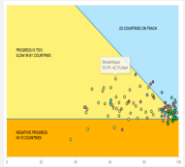
- Property tax is one of the most important revenue sources of cities. And hence most of the cities have computerized record system for properties. And periodically cities reassess the properties through survey.

- Attempt has been made in Wai city, Maharashtra to include onsite sanitation system related questions in property tax assessment forms. When city will do the reassessment, onsite sanitation database will be generated. And then linked permanently with the property database for regular up-dation.



PAS system as a local level monitoring tool for safely managed sanitation services

Cities: monitor the progress in safely managed sanitation services and accordingly take decisions for local level action



States: Identify the inequality in service provision in various city sizes or divisions. Implement the required policies and programs for improving safely managed sanitation services in cities.

National: Rank states based on progress in safely managed sanitation services and provide guidelines and allocate resources to achieve safely managed sanitation target

Advocacy tool: Used as an advocacy tool to create awareness amongst cities and states. Useful to the public health researchers and sector partners for varied purposes.

Contents

Annex 1: SDG ladder calculation

Service level	PAS Indicators	Estimates using PAS Data
Safely managed	• Excreta transported through piped system and treated at sewage treatment plant • Excreta emptied from septic tank*/pit using mechanised means, transported and treated at FSTP/ STP • Excreta not emptied from septic tank*/ pit and contained in the tank / pit • Excreta contained and treated onsite	= Total quantity of sewage treated at least secondary treatment or undergo primary treatment with long ocean outfall *100 / Total sewage generated in the city as per the sewerage network + Total treated sewage samples passed as per standards*100/Total treated sewage samples tested + Total quantity of faecal sludge treated *100 / Total quantity of faecal sludge emptied in the city + Total treated faecal sludge samples passed as per the prescribed standards *100 / Total treated faecal sludge samples tested + 100 – (no of septic tank / pit cleaned annually *100 / households with individual toilets connected with septic tank / pit system) + Households with individual toilets connected to twin pits system or other safe system like ecosan toilets, Johkasou, etc. *100 / Total households in the city
Basic	Households with individual toilets either connected with • Sewerage system • Septic tank • Single pit • Other safe system like twin pits, ecosan toilets, etc.	= % of HHs connected to sewer network+ % of HHs connected to septic tank + % Households with toilets connected to single pit+ % Households with toilets connected to twin pits + % Households with toilets connected to other safe system
Limited	Households dependent on functional community toilets	= % Coverage of households with toilets (individual + community)
Unimproved	Households with toilets connected to unsafe system like pit without slab, night soil disposal, bucket toilets, etc.	= %Households with toilets connected to other unsafe system
Open defecation	Households without individual toilets (improved / unimproved) and even not dependent on functional community toilets	= 100% - % Coverage of households with toilets (individual + community)

Contents

Annex 2: State and class wise safely managed sanitation estimation

State / Class	Year	Safely managed (%)	At least Basic (%)	Limited - shared (%)	Unimproved (%)	Open defecation (%)	Improved sanitation including shared (%)	Sewer connection excluding shared (%)	Onsite excluding shared (%)	Safely managed - Wastewater treated (%)	Safely managed - Disposed insitu (%)	Safely managed - Emptied and treated (%)
Gujarat	2016	65	95	1	0	4	100	66	30	38	27	0.0
Gujarat	2019	73	99	1	0	0	100	72	26	48	25	0.1
Maharashtra	2016	40	72	21	0	7	100	41	32	25	15	0.0
Maharashtra	2019	62	84	16	0	0	100	43	40	38	24	0.1
Chhattisgarh	2016	42	77	4	0	19	100	0.2	76	0	42	0.0
Chhattisgarh	2019	94	97	3	0	0	100	0.3	97	0	94	0.4
Metro	2016	50	81	17	0	2	100	69	12	46	5	0.0
Metro	2019	72	86	14	0	0	100	70	16	62	10	0.0
Large	2016	41	80	10	1	10	99	18	62	4	37	0.0
Large	2019	60	93	7	0	0	100	25	68	11	49	0.3
Small	2016	46	77	8	0	16	100	8	69	0	46	0.0
Small	2019	63	95	5	0	0	100	14	80	1	61	0.1
Gujarat - Metro	2016	68	98	1	0	1	100	93	5	65	4	0
Gujarat - Metro	2019	82	98	2	0	0	100	94	5	77	5	0
Gujarat - Large	2016	59	93	1	0	6	100	34	61	4	56	0
Gujarat - Large	2019	64	100	0	0	0	100	46	54	13	51	0
Gujarat - Small	2016	62	90	2	0	8	100	23	68	0	62	0
Gujarat - Small	2019	56	100	0	0	0	100	40	59	0	56	0

Estimated based on the information provided by cities of Gujarat, Maharashtra and Chhattisgarh for the year 2016 and 2019

Annex 2: State and class wise safely managed sanitation estimation

State / Class	Year	Safely managed (%)	At least Basic (%)	Limited - shared (%)	Unimproved (%)	Open defecation (%)	Improved sanitation including shared (%)	Sewer connection excluding shared (%)	Onsite excluding shared (%)	Safely managed - Wastewater treated (%)	Safely managed - Disposed insitu (%)	Safely managed - Emptied and treated (%)
Maharashtra - Metro	2016	44	73	25	0	3	100	61	12	38	5	0
Maharashtra - Metro	2019	67	80	20	0	0	100	63	17	57	10	0
Maharashtra - Large	2016	31	73	16	1	10	99	14	59	5	26	0
Maharashtra - Large	2019	51	88	12	0	0	100	19	70	12	39	0
Maharashtra - Small	2016	36	71	12	0	17	100	2	69	1	35	0
Maharashtra - Small	2019	58	92	8	0	0	100	5	87	2	56	0
Chattisgarh - Metro	2016	5	90	2	0	8	100	0	90	0	5	0
Chattisgarh - Metro	2019	96	98	2	0	0	100	0	98	0	96	0
Chattisgarh - Large	2016	47	79	5	0	16	100	1	78	0	47	0
Chattisgarh - Large	2019	93	97	3	0	0	100	1	96	0	92	1
Chattisgarh - Small	2016	55	69	4	0	27	100	0	69	0	55	0
Chattisgarh - Small	2019	94	97	3	0	0	100	0	97	0	94	0

Estimated based on the information provided by cities of Gujarat, Maharashtra and Chhattisgarh for the year 2016 and 2019

Thank you

CWAS CENTER FOR WATER AND SANITATION | CRDF CEPT RESEARCH AND DEVELOPMENT FOUNDATION | CEPT UNIVERSITY

https://cwas.org.in

About us

The Center for Water and Sanitation (C-WAS) at CEPT University carries out various activities – action research, training, advocacy to enable state and local governments to improve delivery of services.

pas.org.in
cwas.org.in

pas@cept.ac.in

pas_project

pas.cept

pas.org.in/web/ceptpas/pas e-news
Sign up: tiny.cc/pasenews