

CITYWIDE INCLUSIVE SANITATION (CWIS): A PUBLIC SERVICE APPROACH FOR EQUITABLE SANITATION SERVICE DELIVERY

ADBI-JICA training program on wastewater management and CWIS, Nov 16, 2021

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THE CHALLENGE



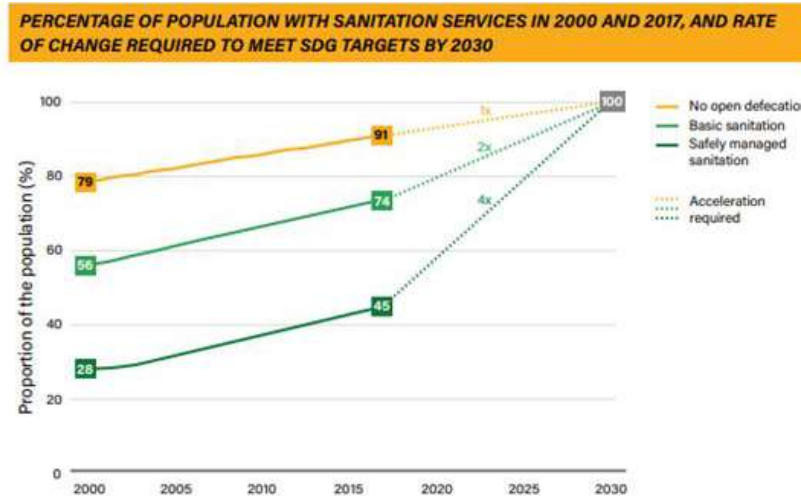
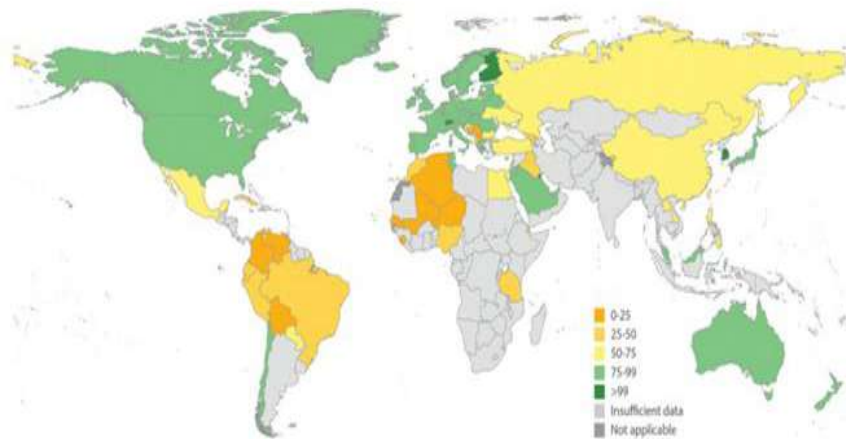
4.2 BILLION

PEOPLE GLOBALLY LACK ACCESS TO
SAFELY MANAGED SANITATION

- **673 million people** do not have toilet, practice open defecation
- **698 million school ages children** lacked basic sanitation services at the school
- **At least 53% of people in urban areas**, do not use toilets which provide full sanitation services
- **14%** do not have access to even basic sanitation services

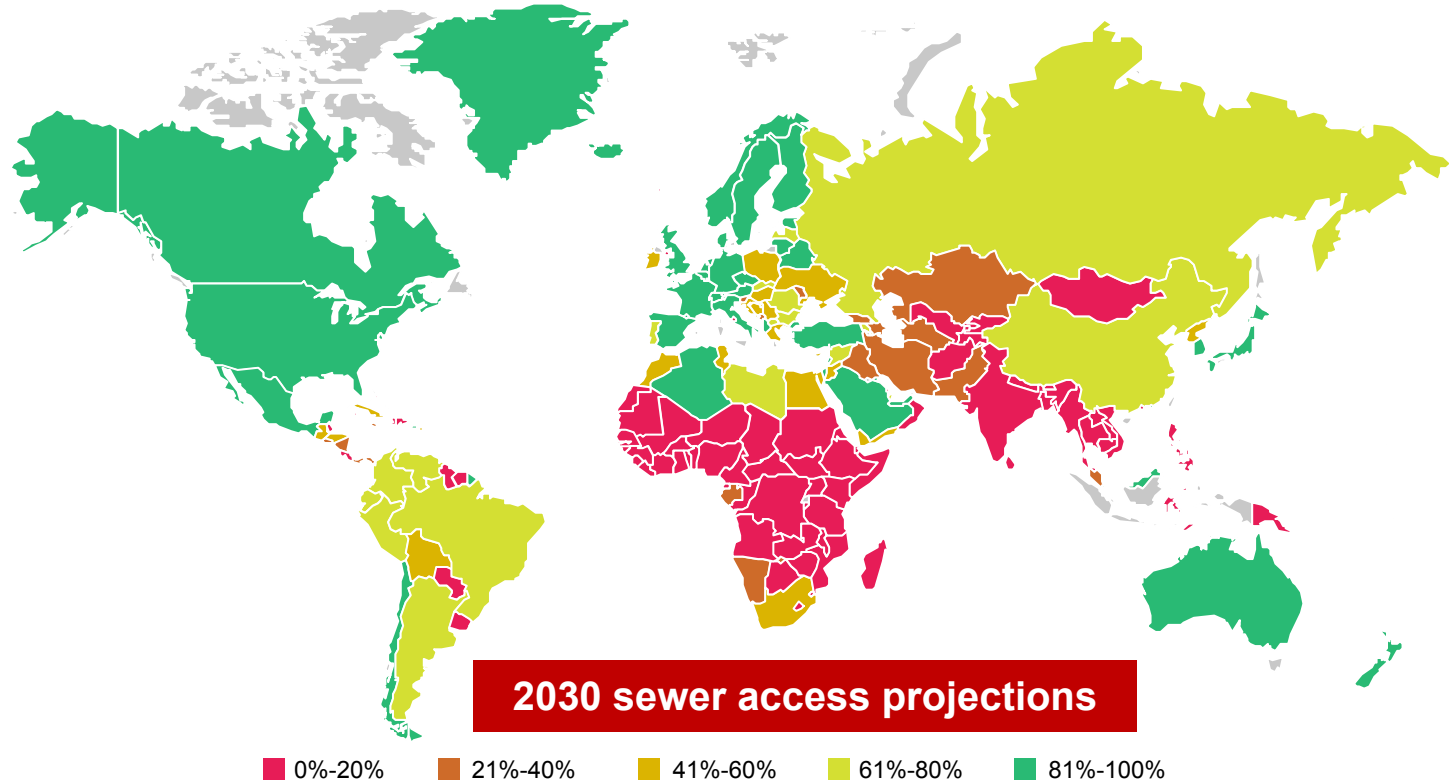
**With only 10 years left until 2030, the rate at which sanitation coverage is increasing will
NEED TO QUADRUPLE if the world is to achieve the **SDG** sanitation targets.**

PERCENTAGE OF POPULATION USING SAFELY MANAGED SANITATION SERVICES, 2017



- In many low-income countries, less than 50 percent of the population uses safely managed sanitation
- Actual data on safely managed sanitation is not available in many countries
- Achieving universal access of safely managed sanitation by 2030 will require dramatic acceleration in current rate of progress

MANY PARTS OF THE WORLD WILL CONTINUE TO LACK ACCESS TO SEWERS

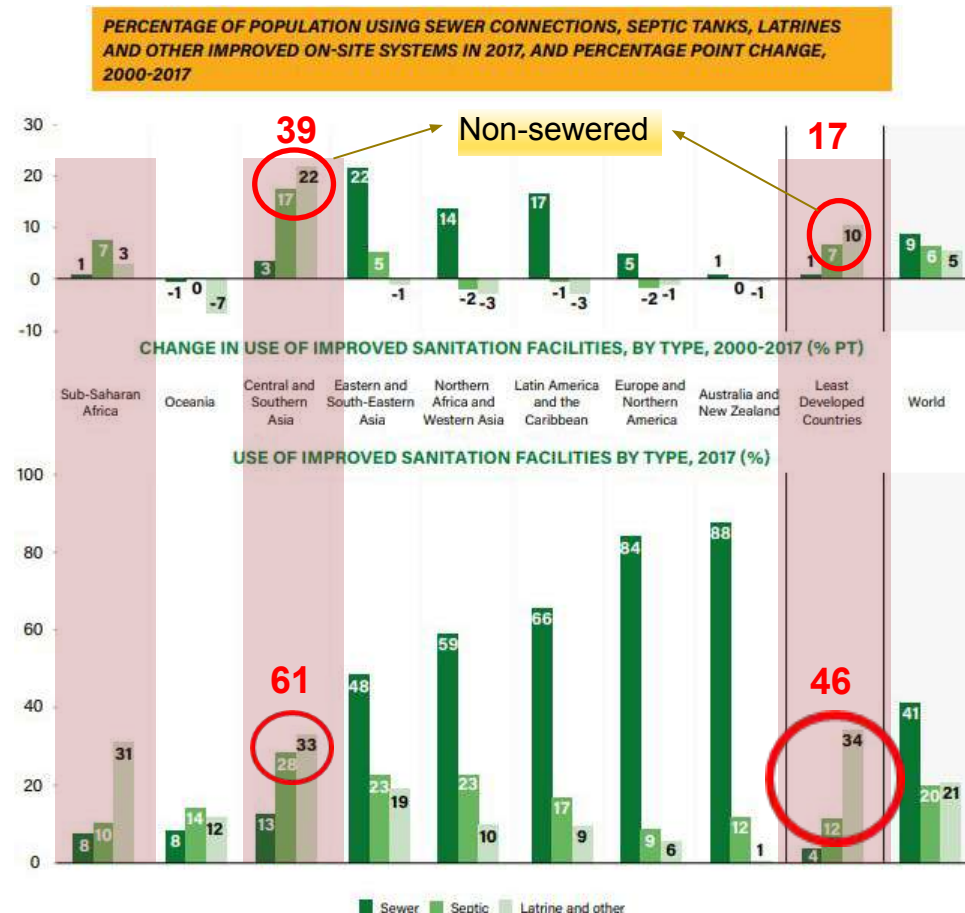


SEWER AND NON-SEWER CONNECTION

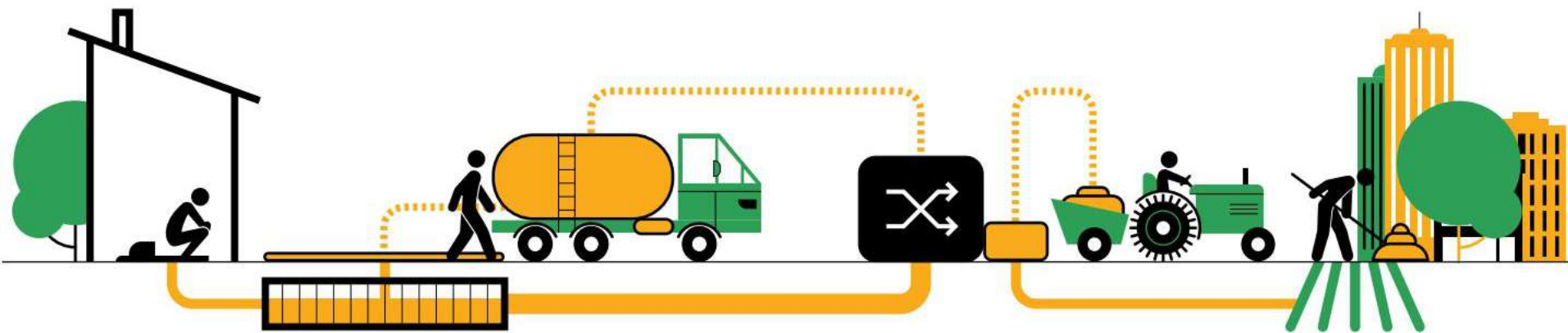
**NO OF NON-SEWERED SANITATION IS
INCREASING THAN SEWERED CONNECTION**

OPTIONS	CAPEX / CAPITA (INR)	CAPEX / CAPITA (USD)
Sewerage system	INR 3,201– 42,695	48 – 650
NSS/FSM	INR 500 – 2,000	8 – 30

OPTIONS	OPEX / CAPITA (INR)	OPEX / CAPITA (USD)
Sewerage system	295 – 3,648	5 – 56
NSS/FSM	100 – 250	2 – 4



SANITATION SERVICE CHAIN



TOILET

Without quality toilets that everyone uses, families and communities are at increased risk of disease, anxiety and violence.



CONTAINMENT - STORAGE/ TREATMENT

Without proper on-site containment or treatment, water used for drinking, recreation and agriculture can be contaminated.



CONVEYANCE

Workers without adequate protections face life-threatening risks when emptying pits and septic tanks and cleaning sewers. Waste spilled or dumped before treatment puts whole communities and food supplies at risk.



TREATMENT

Communities are put at risk when untreated wastewater and sludge pollute beaches, drinking water, and water sources used for irrigation of food crops.



END USE/ DISPOSAL

Drinking or coming into contact with untreated water perpetuates the cycle of infection – especially of intestinal worms and diarrhoea.

If wastewater and sludge are used safely, valuable water, nutrients and energy can be returned to the circular economy.

ELECTROCHEMICAL 电气化学技术

REQUIRES

需要



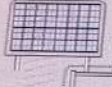
MAKES

成为



SOLAR PANELS

太阳能板



TOILETS
洗手间

LIQUID PROCESSING
液体处理

SOLID PROCESSING
固体处理



ANAEROBIC
TANK

厌氧罐

BIOLOGICAL 生物学技术

REQUIRES

需要



DRY COMBUSTION 干式燃烧

需要

成为



WET OXIDATION 湿法氧化

需要

成为



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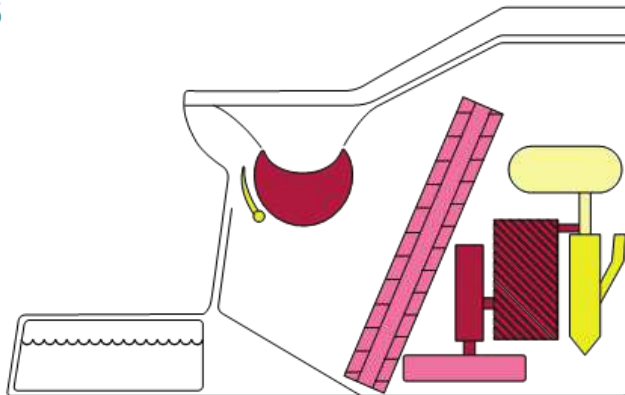
THE TRANSFORMATIVE TECHNOLOGY & COMMERCIALIZATION (TTC) INITIATIVE IS DESIGNED TO ADDRESS TODAY'S LIMITATIONS

ELIMINATE PATHOGENS

- Eliminate safety concerns via handling
- Reduce disease burden
- Improve environmental safety

OPERATE OFF GRID

- Eliminate need for external inputs such as water and energy
- Make portable and easy to install



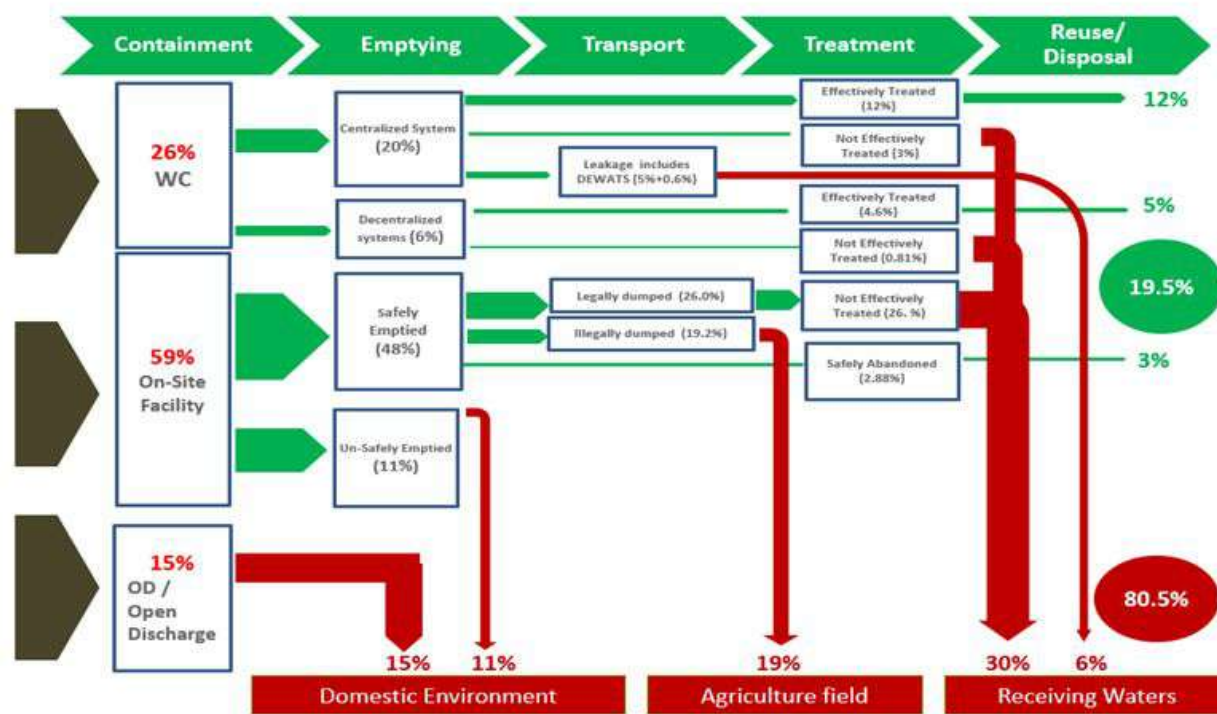
CONVEY LOW LIFE-CYCLE COSTS

- Reduce need for pit emptying
- Ensure a sustainable business model, including maintenance via service providers

PRESENT MODULAR, ATTRACTIVE INTERFACE

- Reduce / eliminate construction costs
- Provide clean and dignified product
- Eliminate odors and waste

SHIT FLOW DIAGRAM - INDIA



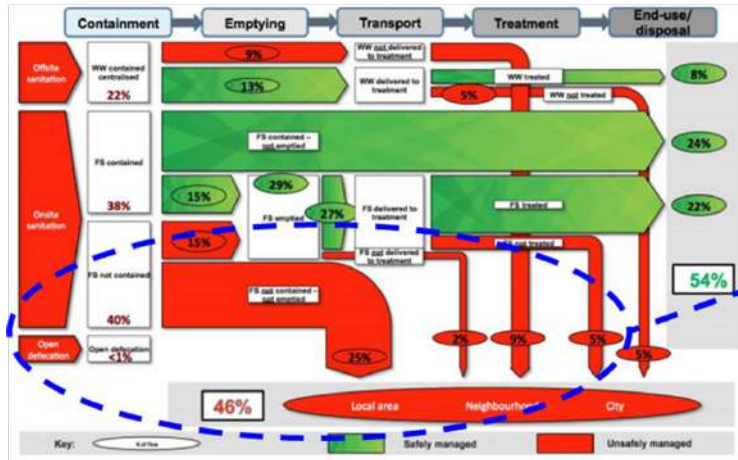
Source: CDD Society, 2020

- Partial sewerage coverage in ~ 500 cities
- Less than 20% sewage generated safely collected and treated

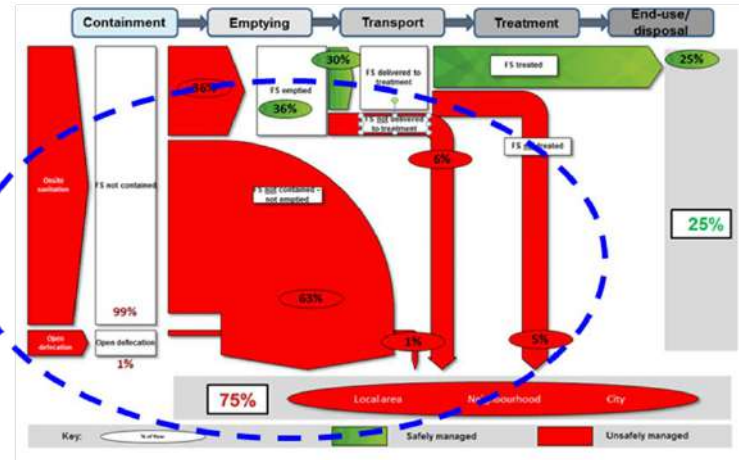
WHY ARE WE TALKING ABOUT CWIS ?

The current approaches for sanitation do not reflect & address the reality of low-income areas

CITY-WIDE



LOW-INCOME AREAS



THE NEED FOR CWIS

PAST

TRADITIONAL APPROACHES

- Master planning/ investment only for **centralized systems**
- Financed by **central gov't/loans**
- **Wealthy/business districts** prioritized
- **Limited coverage**
- **Sustainability challenges** for O&M
- **Resource recovery not considered**
- No **performance management**
- **On-site, small network not considered**



PRESENT

NSS / FSM APPROACHES

- **Often standalone pilots**, not mainstream
- **NGO / pilot financed**
- FSM value chain/fecal sludge treatment plants
- Poor communities targeted but often missed
- **Informal businesses, NGOs independent from service authorities**
- Business models often **unable to scale**
- Limited **professional capacity**



THE FUTURE



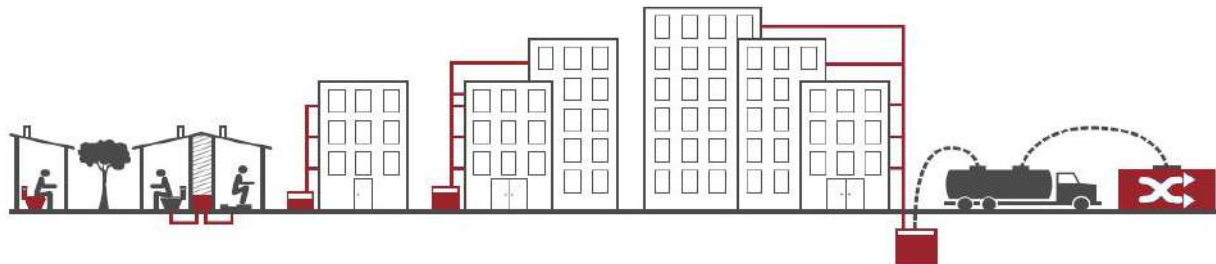
CITY-WIDE INCLUSIVE SANITATION



CWIS focuses on promoting approaches to ensuring everyone in an urban area is served by **safe, equitable, and financially viable sanitation service systems**. This means systems are designed to **reach the poor and to ensure human waste is safely managed** along the whole sanitation service chain.

THE FUTURE: CITY WIDE INCLUSIVE SANITATION

We aim to achieve the following outcomes for sustainable changes in sanitation management:



EVERYONE BENEFITS

from safe services and public investment equitably, with a focus on reaching the poorest



GENDER & SOCIAL EQUITY

are designed into planning, management, monitoring



Human waste is **SAFELY MANAGED ALONG THE SANITATION CHAIN**, starting with containment



Authorities operate with a **CLEAR, INCLUSIVE MANDATE, PERFORMANCE TARGETS**, resources, and accountability



Authorities deploy **RANGE OF HARDWARE, FUNDING & BUSINESS MODELS** to meet goals



Comprehensive long-term planning **FOSTERS INNOVATION, PRO-POOR FINANCING**; informed by analysis of needs, resources



POLITICAL WILL & accountability incentivizes improvements in capacity, leadership, outcomes

GATES FOUNDATION CWIS FRAMEWORK:

Promoting a Public Service Approach



CORE CWIS OUTCOMES



EQUITY

Services reflect fairness in distribution and prioritization of service quality, prices, deployment of public finance/ subsidies



SAFETY

Services safeguard customers, workers and communities from safety and health risks by reaching *everyone* with safe sanitation



SUSTAINABILITY

Services are reliably and continually delivered based on effective management of human, financial and natural resources



CORE CWIS FUNCTIONS

RESPONSIBILITY

Authority(s) execute a clear public mandate to ensure safe, equitable and sustainable, sanitation services for all

ACCOUNTABILITY

Authority's(ies') performance against mandate is monitored and managed with data, transparency, and incentives

RESOURCE PLANNING & MANAGEMENT

Resources—human, financial, natural, assets—are effectively managed to support execution of mandate across time/space



MARKET UPTAKE OF
TRANSFORMATIVE
TECHNOLOGIES

CITYWIDE INCLUSIVE



SANITATION (CWIS)



POLICY &
ADVOCACY



FINANCING:
MULTI-, BI-LAT,
DOMESTIC

PLATFORMS FOR REPLICATION; INSTITUTIONAL & REGULATORY ENVIRONMENT

REPLICATE & SCALE CWIS IN SUB-SAHARAN AFRICA & ASIA (EX-INDIA)

Implementation of CWIS programs and policies in focus countries and moderate engagement countries, and scaling through regional platforms



City examples &
guidance

Country
implementation

DEMONSTRATE, ENABLE &
STRENGTHEN
CWIS APPROACHES

Proof points, **examples**, tools &
normative guidance developed



DEVELOP MARKETS FOR
INNOVATIVE SANITATION TECH

Create **markets** for transformative
sanitation technologies



Institutional change in key
partners

INFLUENCE DEV & FINANCING
PARTNERS

Institutional change in critical
financing and dev partners for scale



INCLUSIVITY |



DATA MEASUREMENT |



GENDER

WHAT WE'RE LEARNING SO FAR: **CWIS CITIES**



FUNCTIONS

- **Urban Sanitation Mandates** are sewer-limited, unclear, or decoupled from performance expectations & finance
- **Municipalities are rarely financed or incentivized** to improve service levels, coverage; may not have sufficient autonomy to hire, generate revenue to organize inclusive public sector service
- **Municipal governance reform** may determine limits & opportunities for sanitation system-strengthening
- **Performance Accountability** systems, generally, do not exist for municipalities, are not applied to NSS for utilities, and not backed by measurement systems when applied
- **Civic engagement needs to be built into institutions** to support behavior change, comm engagement, and reinforce transparency
- **Financing** decisions and outcomes still political, opaque, unaligned, inequitable; decision process transparency & clarity requires clear mandates and performance data
- **State/National Systems** that clarify mandates, establish accountability systems, and tie finance to policy priorities, are required if city-level project gains are to be sustained or replicated



OUTCOMES

- **On-site upgrading does not scale or reach the poor** with behavior change and marketing alone. Subsidies are required for safe, inclusive containment & connections
- **Services do not reach LICs** without meaningful and enforced incentives; different private sector engagement approaches are required to reach LICs
- **Formalizing emptying services does not guarantee safe emptying jobs.** Inappropriate/missing PPE gear, manual emptying, manual trash, broken/poorly designed mechanized equipment prevail if workers' labor rights are not actively protected
- **Integrated NSS/SS planning**, service coordination, finances can improve efficiency and accountability
- **Measurement & monitoring approaches** are unharmonized, but often expensive project-based monitoring fills data gaps in lieu of investing in monitoring systems for improved governance
- **Private sector finance** is available if gov't actively structures demand and addresses payment risk; this is required at all stages of 'value chain'



INNOVATIONS

- **City/Utility IMIS** can improve city services; requires training, software integration, time. Success greater if integrated into national accountability/planning requirements (NWASCO/Lusaka, DPHE/Jhenaïdah)
- **Decanting stations** for fecal sludge/septage reduce travel, costs, infrastructure redundancies; ease private sector engagement, safety (Trichy/Lusaka)
- **City-scale revenue** using "payment commitment" devices like levies, property taxes, bundled tariffs are necessary for inclusive services, but insufficient for on-site upgrades or services; strengthens municipal incentives but difficult to tie to performance (Wai, Lusaka, Khulna)
- **Hardware is costly** for dense, unplanned, highwater areas, SS or NSS; no escaping long term gov't investment (Kampala, Warangal, Khulna, Dakar)
- **Revenue from reuse** possible but no breakeven opex outside orchestrated projects (all cities)
- **Gender training** req'd across city/utility departments; gender mainstreaming in all service engagements (Khulna, Warangal, Trichy)

WHAT WE ARE LEARNING SO FAR WITH DFI INVESTMENT



DFI INVESTMENTS

- Upstream work supported through TF (awareness raising and capacity building, client demand creation, knowledge focus) is crucial but not sufficient; country gov't enabling environment is key
- Operational engagement is essential for success at country level – but Gates team spread thin!
- Our optimism can get the better of us; important to openly discuss and agree on realistic timelines, especially for systems change goals
- The desire to shift ways of working is real; Figuring out how to accomplish this is harder than we thought
- We can't change everything! FOCUS on the items we care about most: e.g. '% poor reached with safely managed'
- We must work from within to change the sector: Build trust and internal allies; show practical 'islands of success' and examples of what works
- Change management is all about PEOPLE! Continue to focus on internal training/exposure, identifying & nurturing champions.
- There is appetite for more Cross-bank Collaboration: Q2 cross-bank learning retreat; quarterly teleconferences; Gates-convened moments to share and push one another

WHAT WE ARE LEARNING SO FAR FROM COUNTRY WORK



COUNTRY WORK

- Policy change does not drive change alone
- Financing and infrastructure also required to focus on service delivery
- Few countries have the institutional framework to incentivize provision of inclusive sustainable services
- Capacity gaps at country level are real and pervasive; progress will be difficult without addressing this – and capacity building takes time
- Investments in national-level soft infrastructure is needed for projects results to sustain and scale: eg e-governance, integrated MIS systems and capacity building of implementers
- Utility change management takes time – human resource capacity & internal structure and financing are huge endeavors that can involve ‘pain’

INTEGRATED MUNICIPAL INFORMATION SYSTEM (IMIS) & CWIS

IMIS Landscape

- Municipal GIS-based database and CWIS baseline of the town
- Strategic sanitation planning and decision-making tools for authorities
- Service delivery management
- Municipality's 'regular business process mapping
- Real time monitoring and evaluation – tax payments, service delivery, KPIs
- Link to external databases – health, emergency response
- Plan infrastructure investment

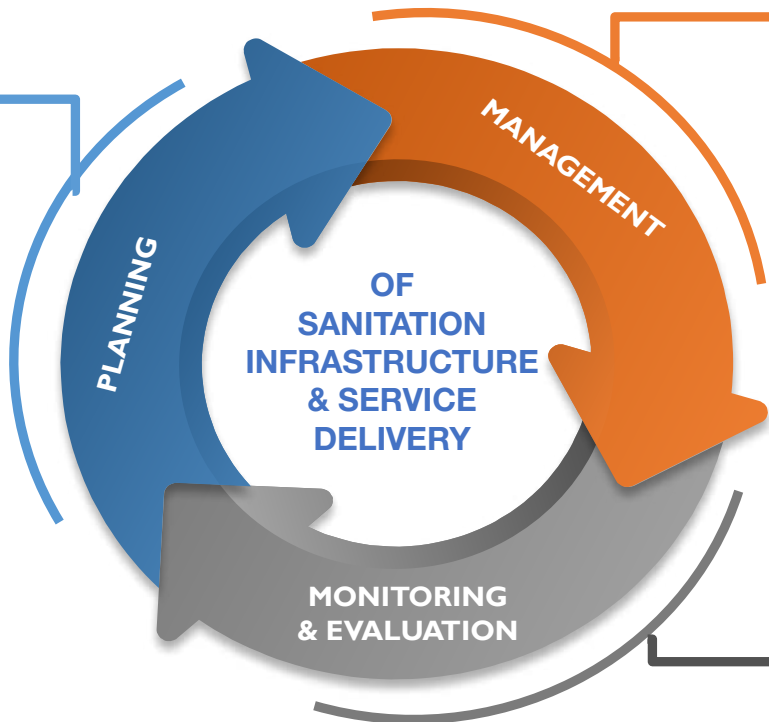


ACCURACY, RELIABILITY, RELEVANCE AND TIMELINESS OF DATA FACILITATED

WHAT WILL IMIS FACILITATE?

PLANNING

- a) **equitable** access to safe, adequate & efficient infrastructure
- b) **sustainable** infrastructure, assets and services
- c) **gender** intentional and socially **inclusive** services and infrastructure
- d) fair and strategic **pricing** of services
- e) the use of **public finances** for the expansion of infrastructure and services and
- f) sanitation **workers' rights**, protections and safety nets

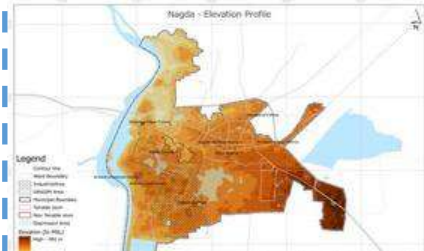


MANAGEMENT

- a) **safe** management of sanitation infrastructure and services
- b) the fair distribution of **public finances** for the expansion of infrastructure and services;
- c) implementation of equitable costs and efficient cost recovery
- d) implementation of pro-poor, gender intentional and socially inclusive mandate;
- e) institutionalization of **key performance indicators** (KPIs)
- f) implement **accountability** measures as well as enforce **regulations** including incentives and penalties.

MLE

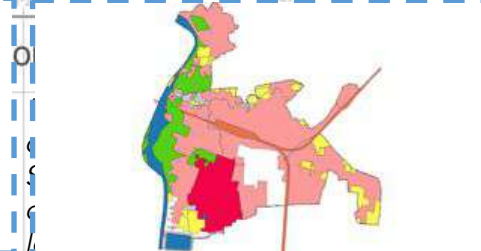
- a) the **quality** and **distribution** of services and infrastructure,
- b) service **authority performance** vis-à-vis the KPIs and targets;
- c) **financial sustainability** of service delivery and infrastructure,
- d) public health and environmental **outcomes** and
- e) pro-poor, **gender** intentional and socially **inclusive** targets.



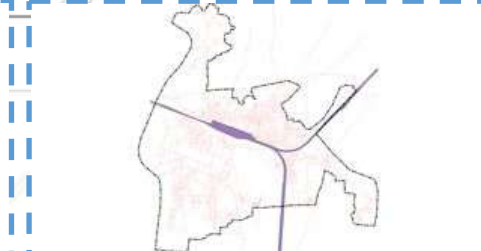
DEM - SRTM Global DEM



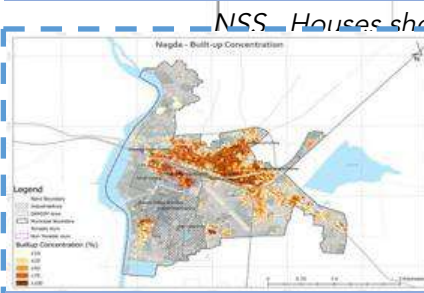
Low Income Settlements, Source: Town



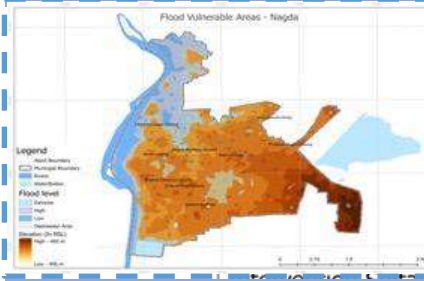
Landuse - Town



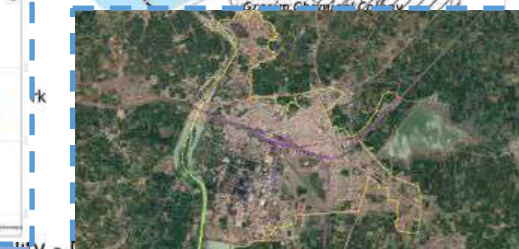
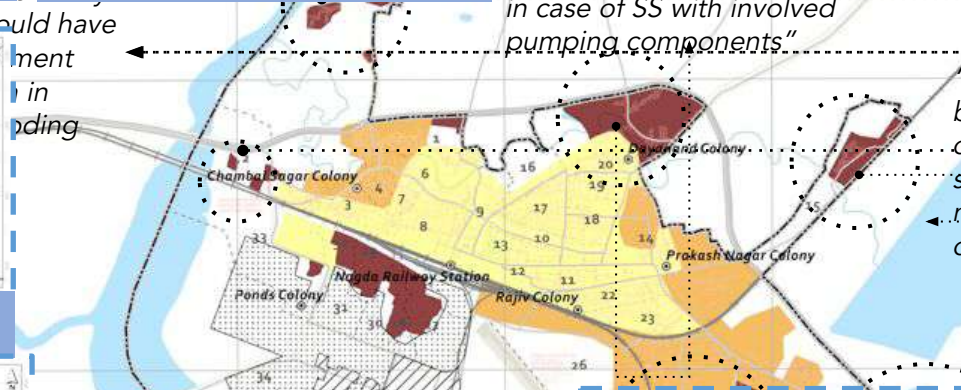
Infrastructure - Town



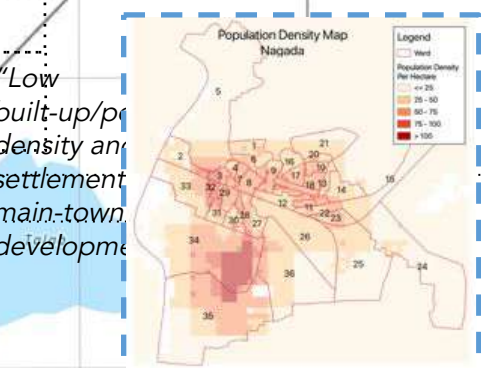
Property Data from Town & Landsat Imagery



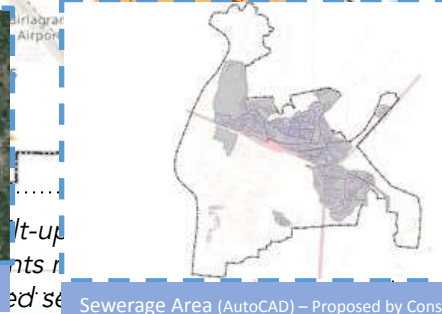
DEM & Water danger line from Water Resource Department MP



Satellite Image, Source Google

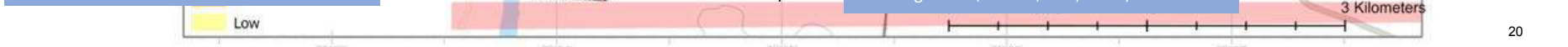


Pop Density, Source: worldpop.org

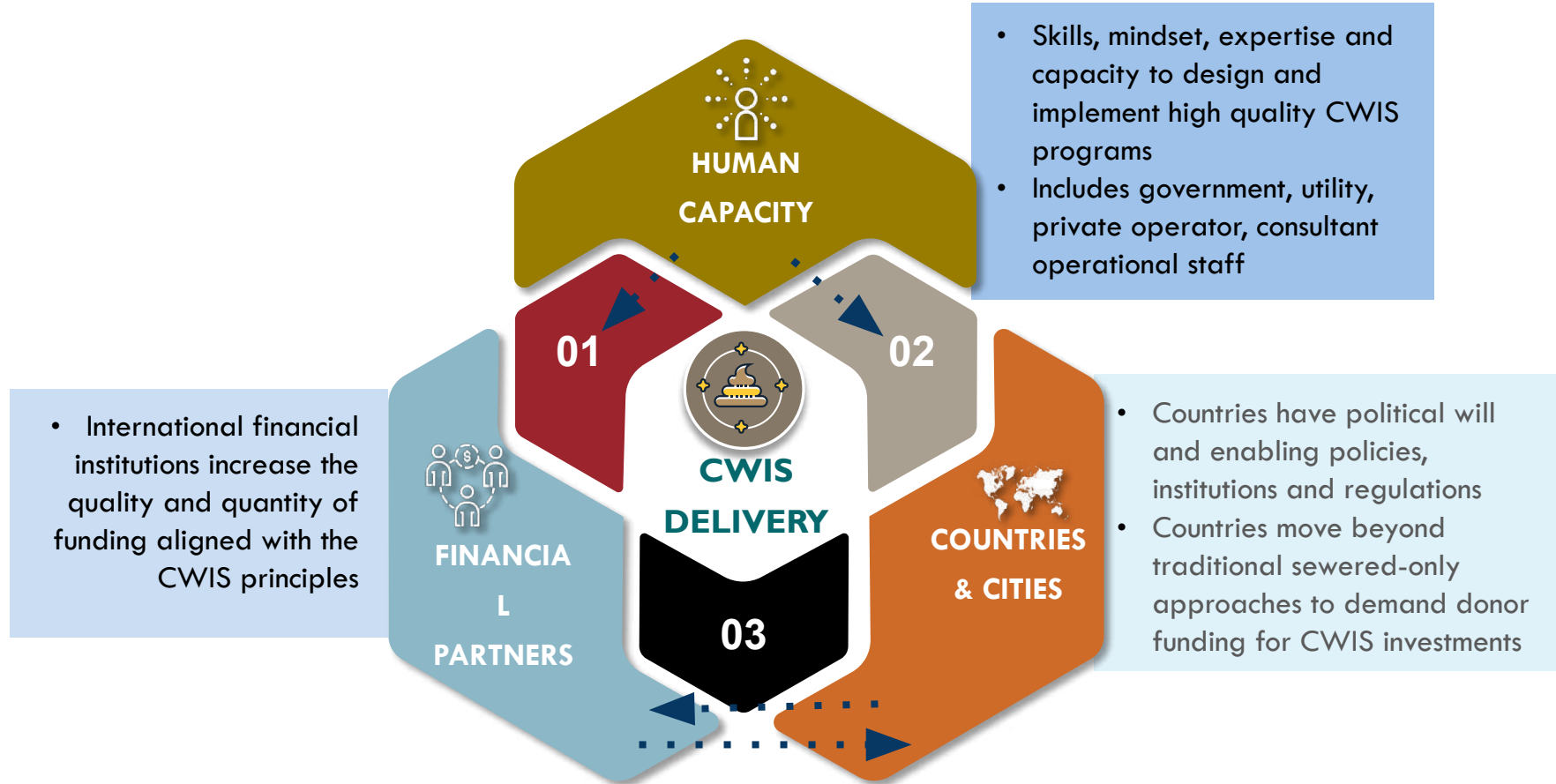


Sewerage Area (AutoCAD) – Proposed by Consultant

“Low built-up/population density and with organic settlement growth of town, may be covered with SS zone, during 2nd phase of interventions”



WHAT WILL IT TAKE TO SCALE CWIS?



BUILD CAPACITY FOR CWIS-FSM IMPLEMENTATION

SUPPLY



Institutionalized & delivered sustainable high quality CWIS/NSS/FSM capacity building programs via at least 50 universities/training institutions that generate more than 500 qualified gender balanced cadre of leaders and champions in the sector.

RESOURCES



New tools (CWIS-SAP, FSM Toolbox, IMIS etc), case studies, training materials & evidence-based knowledge products developed to improve planning and implementation of CWIS and NSS

PROFESSIONAL & INSTITUTIONAL DEVELOPMENT



Two government (Bangladesh and Senegal) departments, at least three IFIs partners (ADB, IsDB, AfDB and JICA), seven utilities, two private entity and regional networks (FSMA, AfWA, and EASWAS) capable to replicate and scale high quality CWIS, NSS/FSM solutions

MSc 370 | 53 inst | 27 countries (Top 5 enrolment - Kenya, India, Indonesia, Bangladesh, Zambia)
 54% Africa; 44% Asia; 2% Europe and LA
 45% Female
 Professional trainings, OLC – 600
 Funding \$100K to 150K/Univ

GLOBAL
 SANITATION
 GRADUATE
 SCHOOL

BILL & MELINDA
 GATES foundation

FSMA



unicef



UTEC

TU Delft

eawag
 research center for water



CEPT
 UNIVERSITY



CAPACITY BUILDING COURSES AND TOOLS

Education & Training

IHE Delft offers a wide range of flexible, high quality, specialized educational programmes to respond to the needs of diverse clients from the water sector.

- MSc programmes
- Short courses
- Online courses
- Tailor-made training



ConCaD

consulting capacity development
for urban sanitation services



Capacity training in the ConCaD in India, Bangladesh. Participants mapping different size operational sanitation services for urban town service contracts, using the ConCaD service charts.

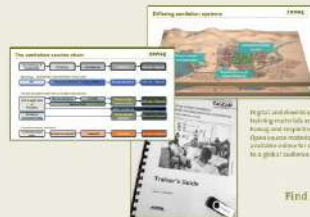
The ConCaD capacity development initiative is a global programme to improve consulting capacity for improved urban sanitation services.



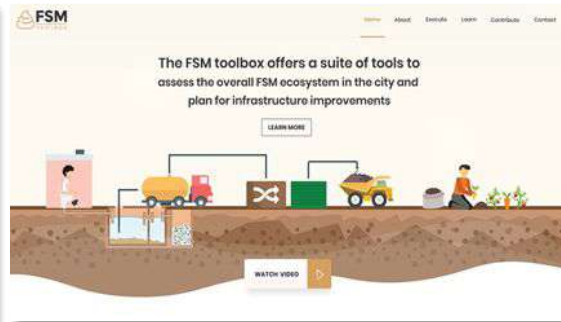
ConCaD training in Kampala, Uganda. Participants preparing a sanitation investment bill to stimulate a local market for private services.

Target audiences are consulting firm staff and freelance consultants working or bidding for 'at scale sanitation investment projects' anywhere in the world and especially in the ConCaD target or nearby countries (India, Nepal, Bangladesh, Uganda, Ivory Coast and Zambia).

Course delivery is through face-to-face short courses at selected partner training institutes (PTIs). Additionally, a three-week on-line course will be delivered on the Coursera learning platform and made available on YouTube for a global audience.



Find out more: www.sandec.ch/concad



This initiative is funded by the Bill & Melinda Gates Foundation.

Multi-Country Twinning Program FSM Knowledge Exchange

Facilitating sustainable FSM programs through collaborative, knowledge-sharing, and action-oriented partnerships.



Our Mission

Advance the knowledge and expertise of FSM professionals and their organizations through exposure visits to successful FSM programs and lessons learned in other countries. Develop a platform and initiate actions to encourage knowledge-sharing within and among countries. Create opportunities for FSM professionals to network and foster development of long-term twinning relationships between organizations and utilities.

To tackle urban sanitation challenges, the World Bank's Water Global Practice and partners have jointly advanced Citywide Inclusive Sanitation (CWIS) and put it into action.



Learn more about CWIS:
www.worldbank.org/cwis



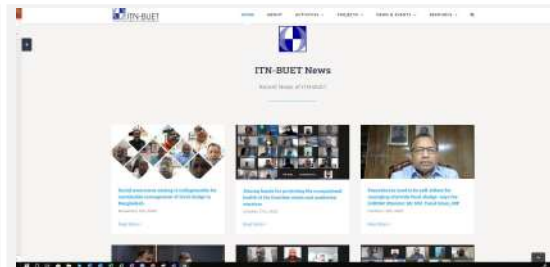
CAPACITY BUILDING PARTNERS AND KNOWLEDGE PRODUCTS



CENTER FOR WATER & SANITATION



FSM ALLIANCE



ITN BUET



CENTER FOR SCIENCE & ENVIRONMENT



CDD SOCIETY - INDIA



CENTER FOR POLICY RESEARCH



SUSTAINABLE SANITATION ALLIANCE



NIUA



ASIAN DEVELOPMENT BANK INSTITUTE



SNV



ENPHO

CAPACITY BUILDING PARTNERS AND KNOWLEDGE PRODUCTS



NEW PUBLICATIONS Citywide Inclusive Sanitation as a Public Service

Please download our new reports which review the CWIS functions - Responsibility, Accountability and Resource Planning & Management



Framework for Addressing Occupational Safety of De-sludging Operators: A Study in Two Indian Cities

Mamta Gautam, Kavita Wankhade, Gayathri Sarangan, Srinitha Suchakar



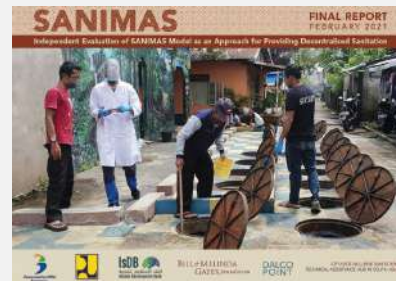
Heart-felt thanks to the entire field team, and all sanitation workers who participated in this study



Integrated decentralized water and sanitation for unserved areas in small Indian towns



Public Health and Engineering (PHE) Department
Union Territory of Ladakh



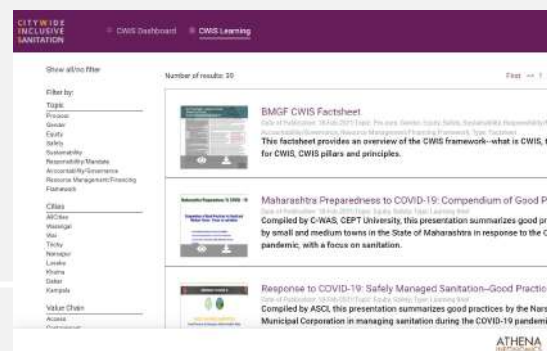
CAPACITY BUILDING PARTNERS AND KNOWLEDGE PRODUCTS



CWIS SERVICES ASSESSMENT & PLANNING TOOL



AFRICAN WATER ASSOCIATION



ATHENA CWIS DASHBOARD



ESAWAS



CITY SERVICE DELIVERY ASSESSMENT

Coming Soon....

West & Central Africa Capacity Hub (UFHB)

South & South East Asia Capacity Hub (INT-BUET with regional partners)

THANK YOU!

