



Urban Sanitation Challenges: Case Studies from Africa and Asia

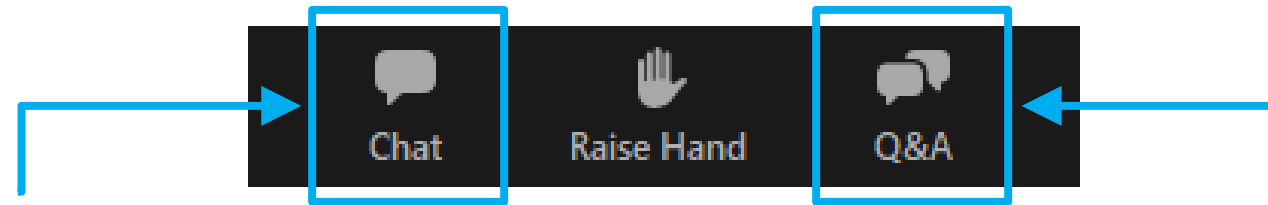
19 JUNE 2024

WEBINAR INFORMATION



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WEBINAR INFORMATION



- **'Chat' box:** please use this for general requests and for interactive activities.
- **'Q&A' box:** please use this to send questions to the panelists. (We will answer these during the discussions)

Please Note: Attendees' microphones are muted. We cannot respond to 'Raise Hand'.

MODERATOR & SPEAKERS



Hezekiah Pireh
UN-Habitat
HQ
(Moderator)



Abishek Narayan
EAWAG
Switzerland



Emanuel Owako
WSUP
Kenya



Thi Thuy Bui
Moleaer Inc.
USA



Harinaivo Anderson Andrianisa
2iE
Burkina Faso



Pritum Saha
WSUP
Bangladesh

AGENDA

- Welcome, housekeeping rules, introduction (5 mins)
Hezekiah Pireh, UN-Habitat
- Keynote speech (7 mins)
Abishek S Narayan, EAWAG
- Extending sanitation services to informal settlements in Ouagadougou (10 mins)
Harinaivo Anderson Adrianisa, 2iE
- Evolution of the Dhaka sanitation sector: institutional and regulatory reform (7 mins)
Pritum Saha , WSUP
- Poll 1 (5 mins)
- Bridging the sanitation data gap in Nakuru (10 mins)
Emanuel Owako, WSUP
- Flood prevention via urban drainage systems, Hanoi (10 mins)
Thi Thuy Bui, Moleaer Inc
- Poll 2 (3 mins)
- Q&A & Discussion (25 mins)
All speakers and moderator
- Key messages and Close (5 mins)
Hezekiah Pireh, UN-Habitat

Evolution of Urban Sanitation towards CWIS

KEYNOTE ADDRESS

Dr Abishek S Narayan
Eawag

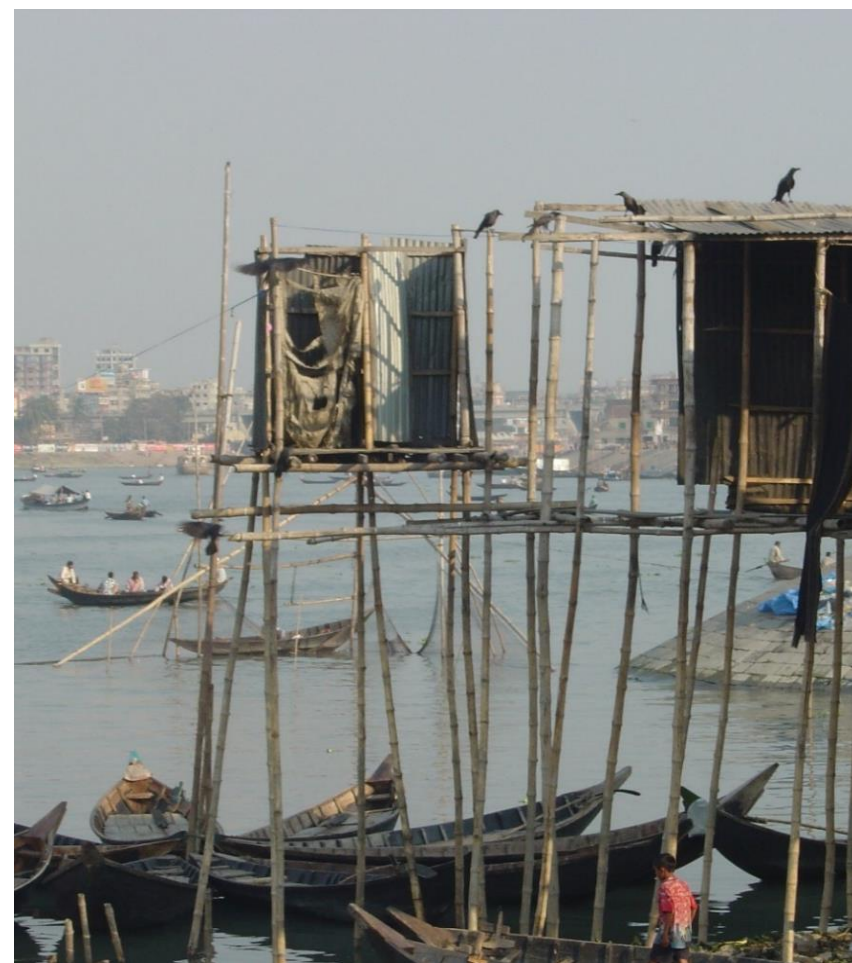
inspiring change



An aerial photograph of a city, likely Mumbai, India. The foreground is dominated by a vast, dense slum with numerous small, makeshift structures, many of which have blue corrugated metal roofs. A narrow canal or stream winds through the slum. In the background, the city transitions into a modern urban landscape with numerous high-rise apartment buildings and commercial structures. The sky is hazy, suggesting a clear day with some atmospheric haze. The text "WE LIVE IN AN URBANIZING WORLD" is overlaid in white, bold, sans-serif font across the middle of the image.

WE LIVE IN AN URBANIZING WORLD

SITUATION ACROSS CITIES IN ASIA, AFRICA AND LATIN AMERICA



Hanging Toilets in Bangladesh

© Water.Org



Flying Toilets in Kenya

© Africa Times



Unusable Toilets in Peru

© WSP

URBAN SANITATION – COMPLEXITIES & PRESSURES

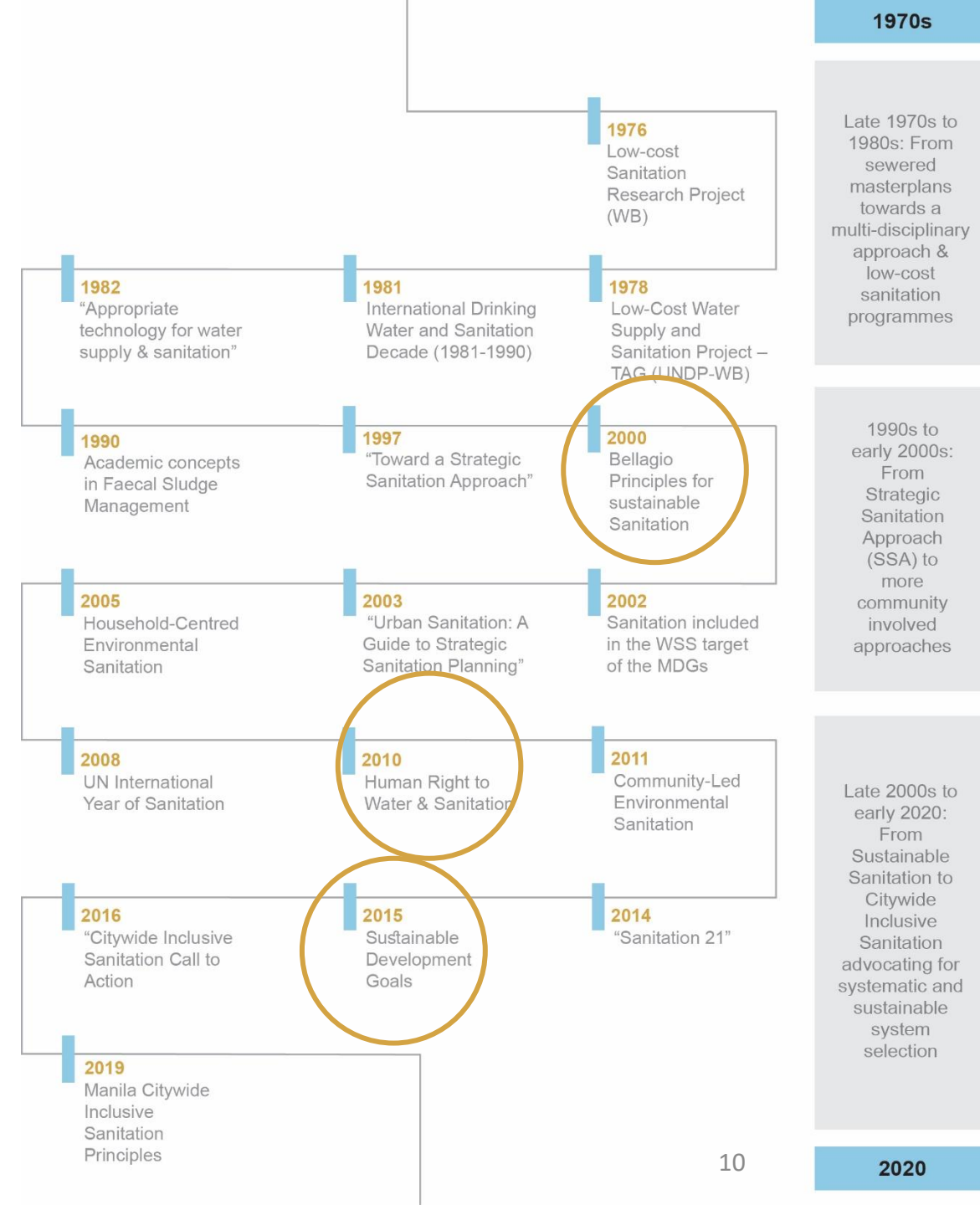
- **Urbanization issues:**
migration, slums, population density, inequities, tenure insecurity etc.,
- **Multi-sectoral interactions:**
water, solid waste, storm water, public health, urban planning, environment etc.,
- **Multi-dimensional aspects:**
social, cultural, engineering, economic, institutional etc.,



EVOLUTION OF URBAN SANITATION

- 1970s to 2020s: Evolution of the urban sanitation development agenda.
- Low-cost and context specific sanitation solutions. Not sewers only.
- Sanitation planning became: strategic, participatory, multi-disciplinary and citywide.
- Key moments include: Bellagio Principles, Human Right to Sanitation, SDGs

Adapted from (Schertenleib et al., 2021)



ADVANCEMENTS IN URBAN SANITATION

- MDGs to SDGs
Toilets to safely managed sanitation.
- Non-sewered & decentralised sanitation solutions incl. FSM, CBS, SSS.
- Development of resource recovery technologies and business models.
- Community based planning methodologies such as CLUES, U-CLTS etc., and related tools to assist.



Aurin Resource
Recovery from Vuna ©

EMERGENCE OF CWIS

- Brings various evolved thinking under one holistic approach.
 - Prioritize the Human rights approach
 - Deliver safe management of whole service chain
 - Recognize sanitation's role in urban economy
 - Work in partnerships (BMGF et al., 2017)

CITYWIDE INCLUSIVE SANITATION
A CALL TO ACTION

A silent urban sanitation crisis is underway. It's time to clean up our acts!

A successful city is one where all citizens live productive, healthy and dignified lives in an environment free from local contamination. Human waste must be managed in ways that safeguard the urban environment, including water and food supplies. Far from being a reality, this vision is under increasing threat. With limited financial and human resources, a changing climate and rapid, unplanned urbanization, cities are struggling to cope. 'Business as usual' is not working. However, the Sustainable Development Goals provide new impetus to ensure access to sustainable water and sanitation services, to keep cities safe and resilient, and to ensure citizens' health and well-being.

Citywide inclusive sanitation means that everybody benefits from adequate sanitation service delivery outcomes, human waste is safely managed along the whole sanitation service chain, effective resource recovery and re-use are considered, a diversity of technical solutions is available for adaptive, mixed and incremental approaches, and on-site and sewerage solutions are combined, in either centralized or decentralized systems, to better respond to the realities found in developing country cities. Cities need to develop comprehensive approaches to sanitation improvement that encompass long-term planning, technical innovation, institutional reforms and financial mobilization. They will need to demonstrate political will, technical and managerial leadership, to focus on durable drivers for innovation, and to manage funding for sanitation in new and creative ways.

To achieve citywide inclusive sanitation, a radical shift in mindsets and practices is needed in sanitation and urban development.

Initiated by a growing group of institutions, 'this Call to Action seeks to mobilize all stakeholders to embrace a radical shift in urban sanitation practices deemed necessary to achieve citywide inclusive sanitation.'

The Bill & Melinda Gates Foundation, Emory University, Plan International, The University of Leeds, Wateraid, the World Bank.

Moving from inadequate sanitation to citywide inclusive sanitation – an example from São Paulo, Brazil (Credit: Secretariat of Housing, Municipal Government of São Paulo)

This briefing note sets the scene and defines guiding principles for citywide inclusive sanitation. Its objective is to bring all actors – including you! – to the table to start the conversation. The principles are not set in stone and a number of specific aspects need to be further developed to help define paths to 2030. We hope to benefit from your inputs as we define a global strategy for implementing the Call to Action. For more information, follow the progress at bit.ly/CWISsignup.

Join us as we commit to this challenging and critical goal of moving to citywide inclusive sanitation by signing up at bit.ly/CWISsignup.

Prioritise the human right of all to sanitation

- Develop **inclusive** strategies and programs to reach the most vulnerable, especially **women and children**
- Focus on **informal settlements** and account for **land tenure** insecurity
- Show political, technical and managerial **leadership**
- Allocate sufficient **funds** for investment and O&M
- Empower qualified staff
- Take **calculated risks** to shift the status quo: start addressing the challenge!

Deliver 'safe management' along the whole sanitation service chain

- Address **complex problems** rather than deliver fixed solutions
- Allow for a **diversity of solutions and approaches**, focusing on outcomes rather than technologies
- Focus on **innovation**, testing and evaluating approaches
- Facilitate **progressive realization**, building on what is already in place – embrace **incrementalism**
- Recognize the **trade-offs** that exist along the sanitation service chain

Recognise that sanitation contributes to a thriving urban economy

- Integrate sanitation in **urban planning and renewal**
- Clean up city streets: remove unsightly pollution and bad odours
- Increase **resource recovery and reuse**
- Reform **regulatory policies**
- Recover water bodies for **recreation and for fauna and flora**

Commit to working in partnership to deliver citywide inclusive sanitation

- Embed sanitation within **urban governance**. Use an integrated approach: link to water supply, drainage, solid waste management, paving, affordable housing, urban development
- Leverage **urban development, health, education and environmental budgets and savings** thanks to improved sanitation
- Establish clear **roles and responsibilities**, with accountability and transparency
- Articulate and build demand and engage with civil society at the **grass roots level**

- A consensus between research institutions, development banks, NGOs governments etc.

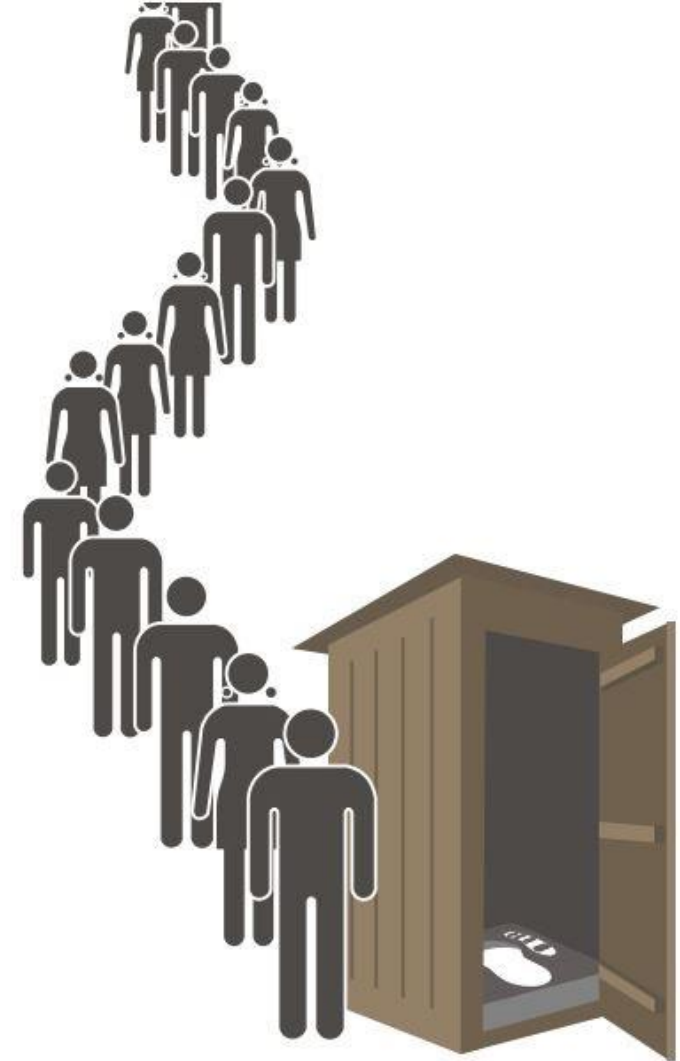
- CWIS emerged as a paradigm shift since 2016 and has gained huge traction since.



WHAT IS CWIS?

An approach to urban sanitation, where all members of the city have equitable access to adequate and affordable improved sanitation services through appropriate systems of all scales (sewered & non-sewered), without any contamination to the environment along the entire sanitation value chain.

(Narayan and Lüthi 2020)



MANILA PRINCIPLES ON CWIS

1. Equity

Everyone in an urban area — including communities marginalized by gender, social, and economic reasons — benefit from equitable, affordable, and safe sanitation services.

2. Environment and public health

Human waste is safely managed along the entire sanitation service chain, starting from containment to reuse and disposal.

3. Mix of technologies

A variety of sewerred and non-sewerred sanitation solutions coexist in the same city, depending on contextual appropriateness and resource recovery potential.

4. Comprehensive planning

Planning is inclusive and holistic with participation from all stakeholders including users and political actors — with short- and long-term vision and incremental perspective and is synergistic with other urban development goals.

5. Monitoring and accountability

Authorities operate with a clear, inclusive mandate, performance targets, monitoring requirements, human and financial resources, and accountability.

6. Mix of business models

Sanitation services are deployed through a range of business models, funding sources, and financial mechanisms to reach all members equitably.

(Narayan and Lüthi 2020)

CWIS SERVICE FRAMEWORK



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



RESPONSIBILITY

Authority executes a clear public mandate to ensure safe, equitable and sustainable, sanitation services for all

ACCOUNTABILITY

Authority's 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

CWIS HAS WIDE UPTAKE



**Implementation of
CWIS projects
mainstreamed**



**Way forward in
International
development**



**Degree programs
and Cap Dev
initiatives**

\$6+ Billion

**Invested in CWIS
project by various
Banks and Dev
agencies**



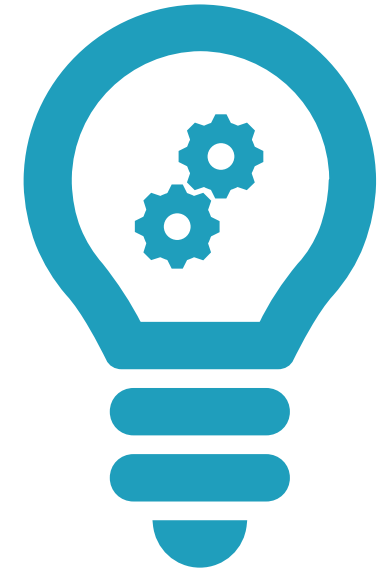
**Wide research on
CWIS topics**



**Tools to plan and
design CWIS**

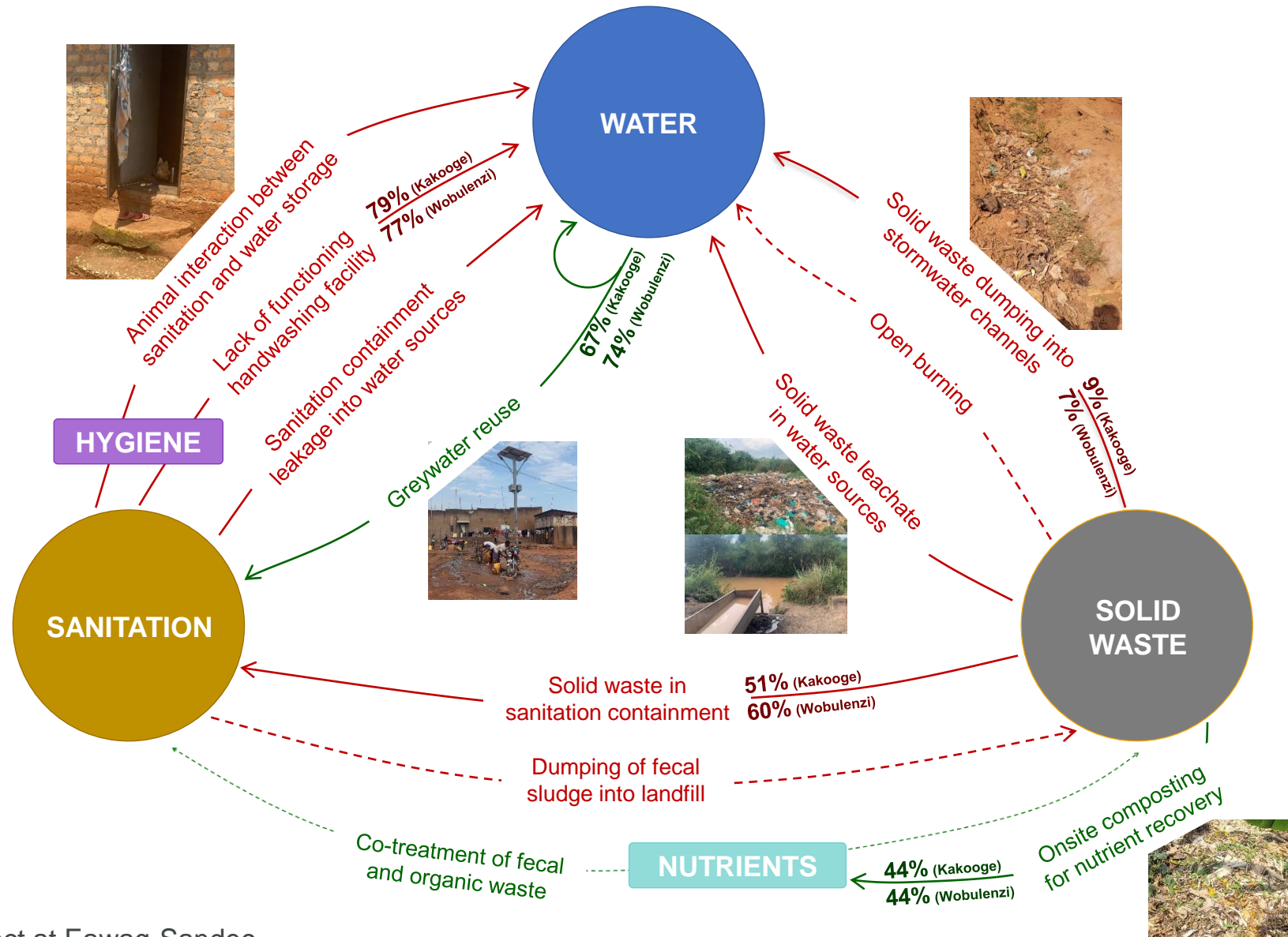
STATE OF THE ART ON CWIS

- Reviewed over 77 research articles, policy briefs, and guidance notes on CWIS that exist today.
- Four prominent CWIS frameworks exist – ADB, BMGF, Eawag, World Bank. But they all largely agree on the commonalities, and only differ on the basis of their emphasis.
- Most of the research and knowledge documented has been so far on (i) Institutions and Regulations and (ii) Planning CWIS.
- Major gaps are on (i) Impacts of CWIS on public and env. health, and (ii) How mix of technologies can be chosen and governed.
- Key issues that have gained prominence to be incorporated: Climate, Sanitation Workers, Integration



(Schelbert and Narayan, upcom. 2024)

INTEGRATED ASSESSMENT IN UGANDA



Negative interlinkages

Positive interlinkages

— Identified/ observed interlinkages

- - - - Potential interlinkages

% values: reported from surveys

IWA INCLUSIVE URBAN SANITATION INITIATIVE



- Engage diverse stakeholders through 2 broad objectives:
 - Focus on the **public sector approach** to sanitation **service outcomes**.
 - Progress a **widely applicable framework** supported by **actionable guidance** to advance inclusive urban sanitation, especially in low- and middle-income countries.
- Diverse pool of **Advisory Board** and **Task Force** members.

IWA INCLUSIVE URBAN SANITATION INITIATIVE



**GET
INVOLVED**

- **Publications** (IWA Special Issues journal, books, discussion papers, stories, etc).
- **Knowledge management** (Webinars, blogs, capacity building, MOOCs/focused training).
- **Global consultation-** Urban sanitation applicable framework & actionable guidance
- **Workshop** sessions at IWA and other events.



Extending sanitation services to informal settlements in Ouagadougou, Burkina Faso

HARINAIVO ANDERSON ANDRIANISA, INSTITUTE 2IE, BURKINA FASO



KEY DATA FOR THE CITY OF OUAGADOUGOU



Demographics	Population in Ouagadougou city*	2,453,496
	Population Density**	90.3 / KM2
	Low-income area (LIA) population	809,654 (33% of Ouagadougou's population)
Water and sanitation services	Water network coverage (%) connections	99
	Sewerage coverage (%)	0.4
	Dependent on onsite sanitation (%)	96.3
	Access to improved containment (%)	46.2
	Dependent on shared facilities (%)	6.7
	Wastewater treated (%)	18
	Sludge treated (%)	36 - 38
Institutional arrangements	Policy making and regulation	Ministry of Water and Sanitation (MEA)
	Planning	Office National de l'Eau et de l'Assainissement (ONEA) (public utility)
	Service provision	<ul style="list-style-type: none"> ONEA (sewer services, construction of toilet facilities, WWTP and FSTP operation) Private service providers (emptying and transport, construction of toilet facilities)



THE ISSUE OF INFORMAL SETTLEMENT



- Not structured settlements , Land tenure.
- No basic social services.
- Located on the city margins, on the edge of formal areas.
- Unsustainable construction.
- Accessibility, particularly during the rainy season.

STRATEGIES FOR SANITATION SERVICES PROVISION



National constitution

The only French-speaking country in West Africa to date to have integrated access to water and sanitation as a national ambition into its constitution

Article 18 of the constitutional law n°072-2015/CNT revising the constitution of Burkina Faso

National Policies

A national investment programme is in place for the period of 2016-2030, which includes clear plans for sanitation.

National Strategies

No specific strategy to address sanitation in informal settlements.

Strategical initiatives from some national structures

Restructuring of informal settlements to facilitate projects implementation, including sanitation improvements.

Ministry of Housing, Urban Planning and the City, 2021

The use of the concept of "Urban Agglomeration" instead of "Urban area" to consider informal settlements in the development of water and sanitation services.

Office National de l'Eau et de l'Assainissement (ONEA)

INITIATIVES FOR EXTENDING SANITATION SERVICES TO INFORMAL SETTLEMENTS



1

PERISAN Project (2012-2016)

The PERISAN Project, funded by international organizations, has successfully subsidized household latrines. They also introduced the movable "LILI latrine" model, which has revolutionized sanitation in many communities (5 informal settlements and 16 peripheral sectors in Ouagadougou).

2

ONEA's Private Provider Approach

ONEA, the local sanitation authority, has taken an innovative approach to improve sanitation services in informal settlements. They have delegated the services to private providers, resulting in increased latrine construction and improved hygiene practices. Partnership with BASED to expand services to new settlements. Payment of 5000 XOF (About USD 8) per latrine to the private provider (to be improved)

3

KfW Budgetary Support (2021)

KfW, has played a crucial role in expanding water and sanitation services to informal neighborhoods. Their budgetary support has enabled ONEA to reach underserved communities and improve the overall quality of life. Target areas: 14 cities outside of Ouagadougou and Bobo-Dioulasso.

MODEL OF SANITATION SERVICES ADAPTED TO INFORMAL SETTLEMENTS



Onsite Sanitation

Onsite systems are better suited for informal settlements than sewerage. They provide immediate access to sanitation services, improving the health and living conditions of residents.

Mapping and Partnerships

Continuously updated maps and partnerships are key for service extension. By collaborating with local organizations and communities, the most in need areas for sanitation solutions and ensure efficient service delivery can be identified.

Adaptable Toilet Models

The "LILI latrine" allows for relocation in settlements. With its modular design, it can be easily disassembled and moved to a safer location, ensuring access to sanitation even in challenging environments.

Formalized Manual Emptying

Collaboration with ABASE (Association of manual emptiers) to provide safe and accessible sludge removal. Through proper training and equipment, it will ensure that manual emptying is carried out with utmost care, protecting the health of workers and minimizing environmental impact.



THANK YOU FOR FOLLOWING



Dhaka, Bangladesh – Institutional and Regulatory Reform in a Mega-City Context

PRITUM SAHA, WSUP BANGLADESH



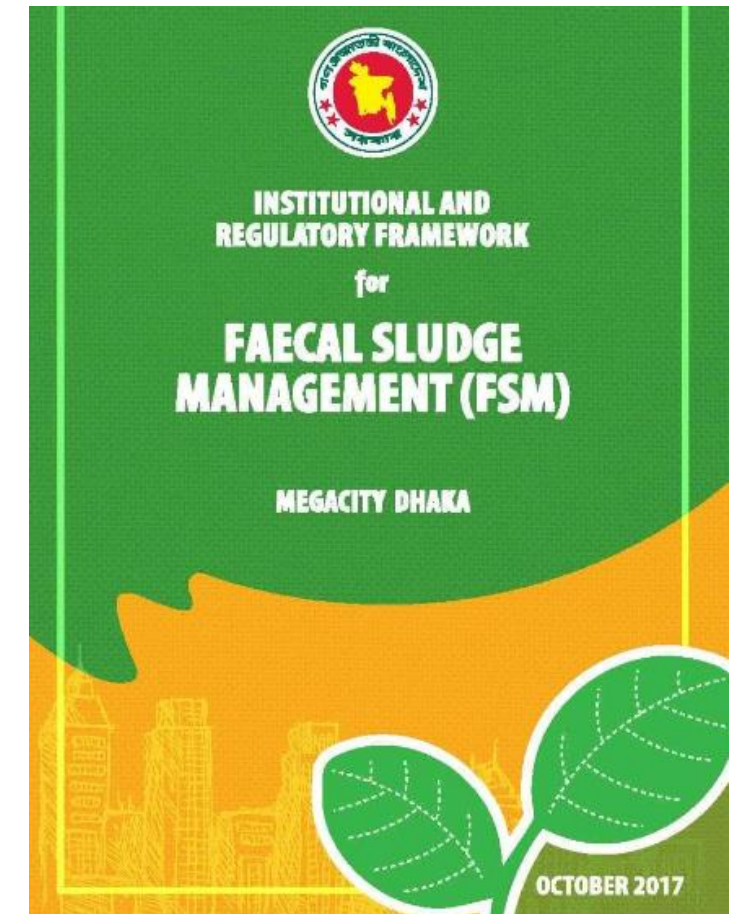
CHALLENGE: LACK OF REGULATION AND ENFORCEMENT FOR TOILET CONNECTIONS

- Dhaka's population has multiplied 14 times in 50 years since 1971. The megacity is now the seventh most populous in the world with over **21 million residents**
- Most Dhaka slums are established adjacent to rivers and canals and are not connected to planned networks
- Disposal of solid and faecal waste to these waterbodies became commonplace, with **toilets often connected directly to canals and open surface drains** (over 70% in some LICs)
- Though responsible for wastewater management, the utility DWASA was unable to play any significant role in regulating this practice



WAY FORWARD: CITY-LEVEL INSTITUTIONAL AND REGULATORY REFORMS TO CLARIFY RESPONSIBILITIES

- The Megacity Dhaka Institutional Regulatory Framework for Faecal Sludge Management (**IRF-FSM**) (2017) clarified **responsibilities for enforcement of containment standards for onsite systems** and for stopping the direct connection of containment structures to surface drains
- City Corporations (CCs) have since begun to **clear the canals** filled with solid waste, serve legal notice to those illegally using the canals, and **create awareness** among property owners of the need to stop direct toilet connections
- However, a large part of the IRF-FSM for Dhaka is **still to be executed**. CCs are only slowly adapting to their enhanced roles in FSM, and only now developing investment plans for onsite sanitation



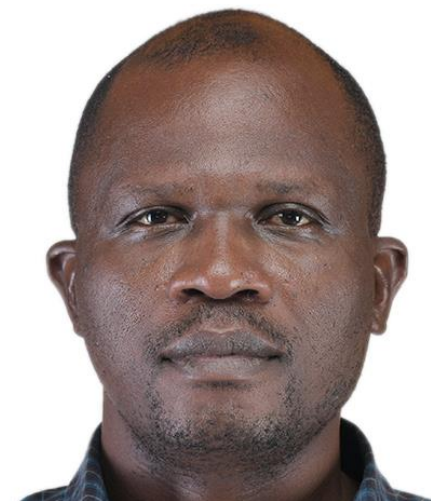
POLL 1

MODERATOR: HEZEKIAH PIREH



Nakuru, Kenya – Bridging the Sanitation Data Gap

EMANUEL OWAKO, WSUP KENYA



CHALLENGE: DATA GAP FOR ONSITE SANITATION

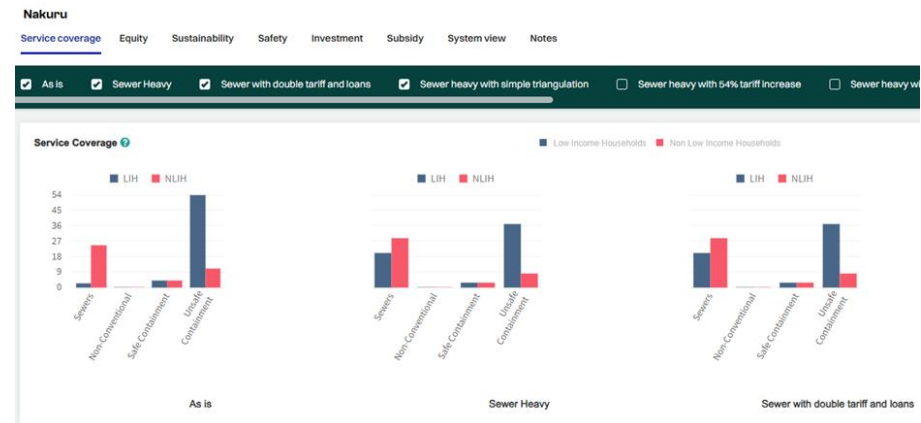
- The local government-owned public utility NAWASSCO is explicitly in charge of sewerage and onsite sanitation across the county
- **Lack of data is a clear limitation for NAWASSCO to fulfil this mandate:**
 - The utility has up-to-date information on key metrics for sewerage services, with data readily accessible through an automated system, but **data related to onsite services is lacking**
 - Data critical for guiding investment and service planning — for example, the proportion of households with access to pit latrines and septic tanks respectively within a given service area — has not been collected
 - Where it does exist, **data is domiciled within other institutions** (for example the Department of Health)



WAY FORWARD: CENTRALIZED DATA MANAGEMENT WITHIN THE UTILITY LEADING TO IMPROVED SERVICE PLANNING

- In collaboration with the national regulator WASREB, **NAWASSCO participated in a pilot of EquiServe** — a tool designed to assist planners and service providers in mapping city-level service coverage, costs and revenue models
- The pilot has developed NAWASSCO’s understanding of the need to **centralize information within the utility**
- NAWASSCO is strengthening its M&E systems across the utility departments and functions to enhance service planning

Key Metric	Indicators
Service Coverage	Service coverage for low-income and non low-income households, disaggregated by sanitation categories: <ul style="list-style-type: none"> ▪ Sewers ▪ Non-conventional ▪ Safe containment ▪ Unsafe containment
Equity	[All indicators sub-divided by low-income / non low-income households; sanitation categories] Public Expenditure Targeting Public Expenditure Capex Public Expenditure Opex Public Expenditure per Capita Average Annual HH Expenditure
Sustainability	[All indicators sub-divided by low-income / non low-income households; sanitation categories] Total Government Cost (Grants & Government Transfers) Cost Coverage (Revenue/Cost Ratio; Net profit / loss) Water requirement
Safety	Safely managed Faecal Waste (per centage of waste safely managed at each level of the sanitation chain for each sanitation category)
Investment	Utility Net Income Private Operator Net Income Available Finance Vs Required Investment
Subsidy	Subsidy requirement Household components (by containment option)



An aerial photograph showing a cityscape on the left, a river in the center, and a large concrete drainage structure on the right. A blue semi-transparent banner is overlaid on the image, containing the title text.

Flood prevention via urban drainage systems, Hanoi, Vietnam

THI THUY BUI (PH.D.) – MOLEAER INC., USA



OVERVIEW

Geographical information

- Country: Vietnam
- City: Hanoi
- City population: ~ 8.3 mil

Water and sanitation services:

- Water network coverage connection: 42 ~ 71% (2010)
- Sanitation coverage: > 60%
- Wastewater treated: 28.8%
- Sludge treated: 2 – 8%
- Combined sewerage and drainage system



Source: <https://www.britannica.com/place/Hanoi>

PROBLEM

- Water pollution and frequent **FLOOD**



Discharge from households
to canal



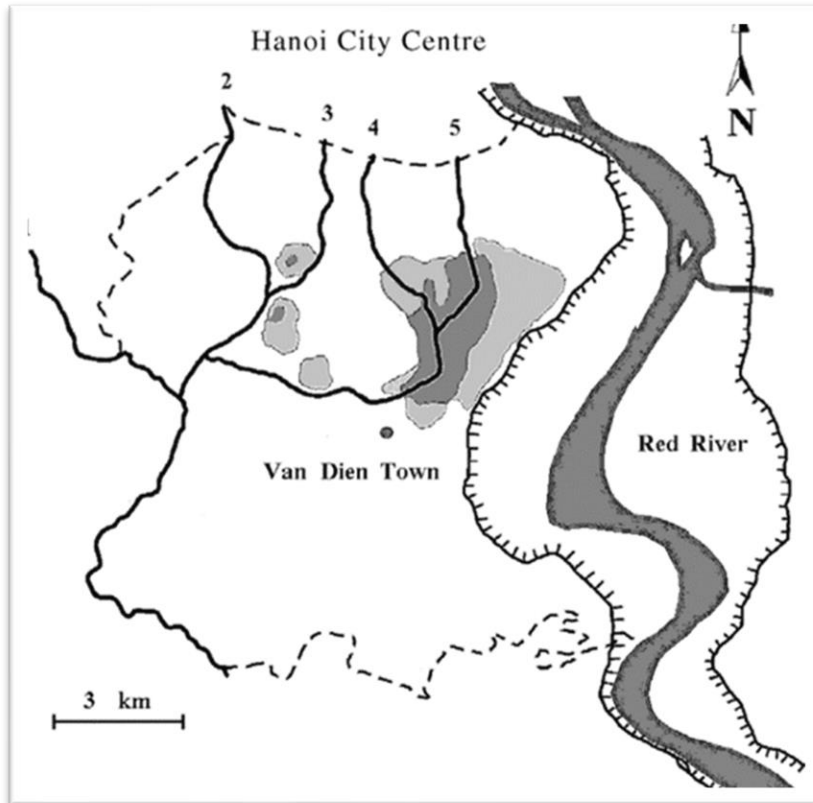
Discharge from a sewer to a
river



Flood in Hanoi due to heavy
rain (24th May, 2024)

PROBLEM

Wastewater reuse for fishery, rice and vegetable cultivation but **LACK** of safe reuse guideline



Wastewater-fed areas in Thanh Tri District, Hanoi
(Source: Thanh Tri office)



Wastewater reuse in vegetable cultivation

SOLUTION

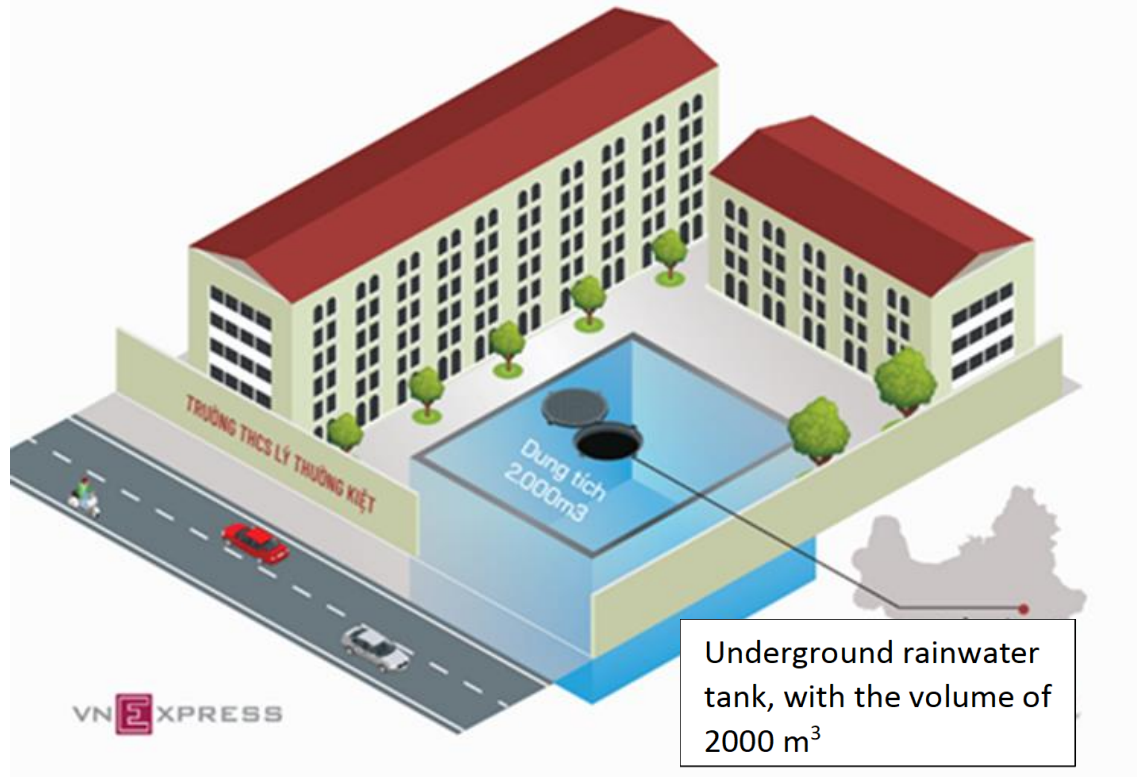
- Efficient wastewater and faecal sludge management




Viet Nam Circular Economy | UNDP
Policy Dialogue | Đối thoại chính sách
BRIDGING POLICY AND INDUSTRY TO CLOSE THE LOOP OF INDUSTRIAL WASTEWATER
 Kết nối chính sách và doanh nghiệp nhằm tuần hoàn nước thải công nghiệp
 Hà Nội, 11/10/2023

SOLUTION

- Sustainable urban drainage solutions (SUDS) implementation: Source control



Rainwater storage tank for flood mitigation in Nguyen Khuyen Street – Hanoi, constructed at Ly Thuong Kiet secondary school in 2020



Rainwater storage tank at Hanoi University of Civil Engineering for flood mitigation and drinking water supply (Source: V-A Nguyen, 2022)

SOLUTION

- Sustainable urban drainage solutions (SUDS) implementation: Pathway – Receptor control



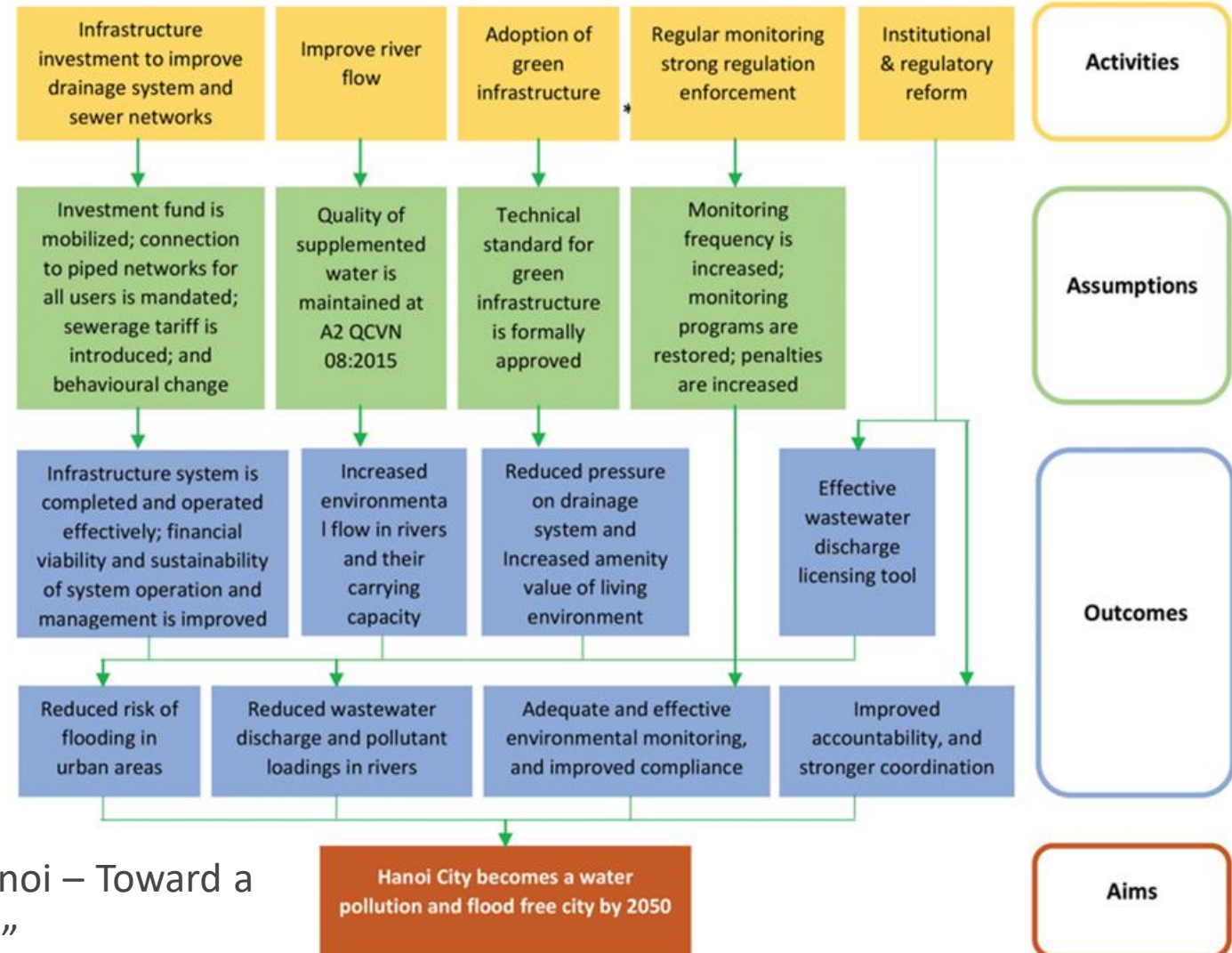
Yen Nghia pumping station



Rehabilitation of four rivers in Hanoi: tackle water pollution

SOLUTION

Recommendation of investment theory of changes for SUDS in Hanoi

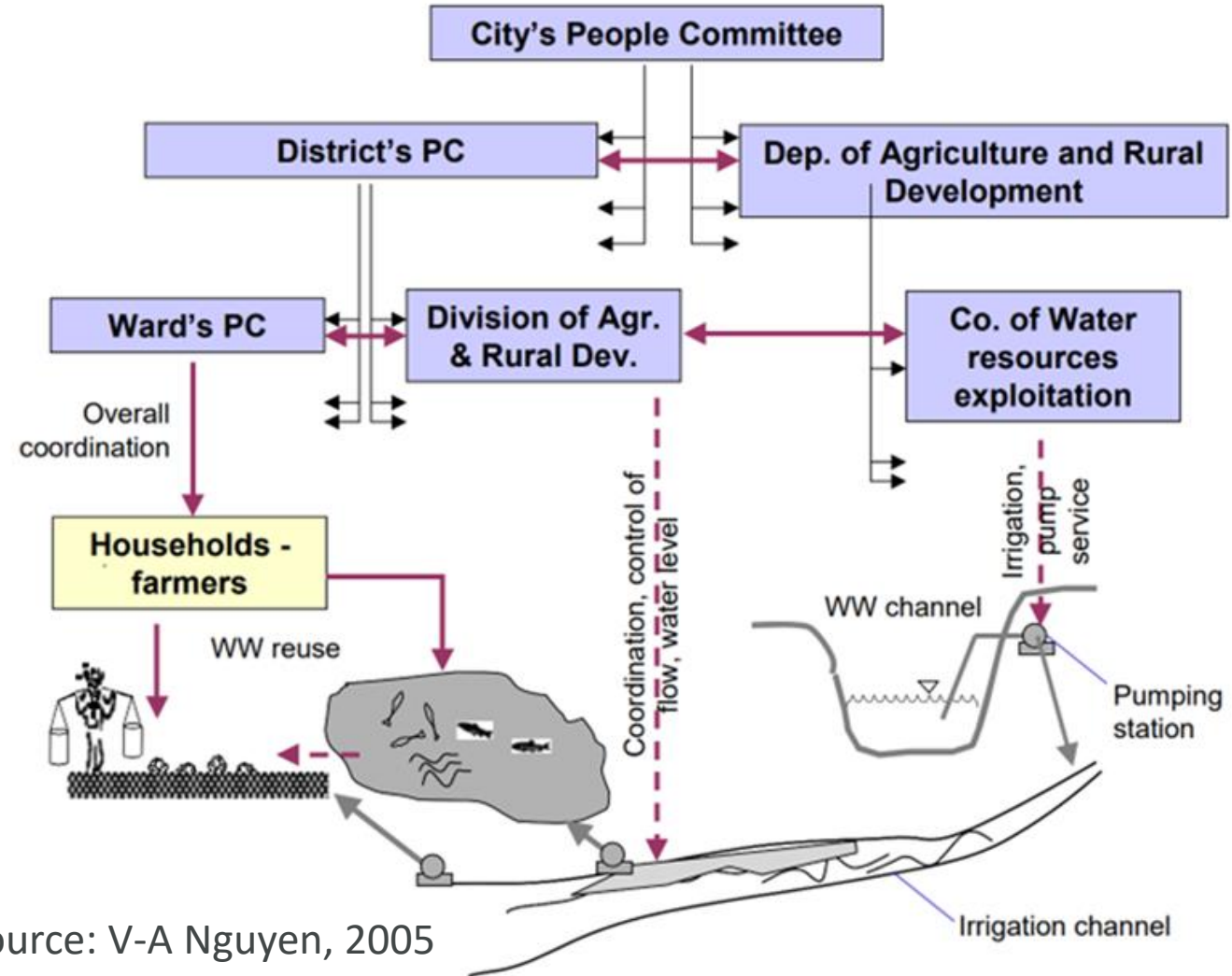


World bank 2020 “Policy note: Hanoi – Toward a water pollution and flood free city”

SOLUTION

Management arrangements for wastewater management in peri-urban areas of Hanoi

- Recognizing the potential dangers of wastewater reuse for agriculture
- Developing institutional arrangements and policies
- Protecting consumers



THANK YOU VERY MUCH

Ph.D. Thuy Bui

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POLL 2

MODERATOR: HEZEKIAH PIREH

Q&A Discussion

MODERATOR: HEZEKIAH PIREH

Final remarks & Conclusion

MODERATOR: HEZEKIAH PIREH

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and the SDGs

IWA
the international
water association

 27 June 2024
13:00-14:00 BST

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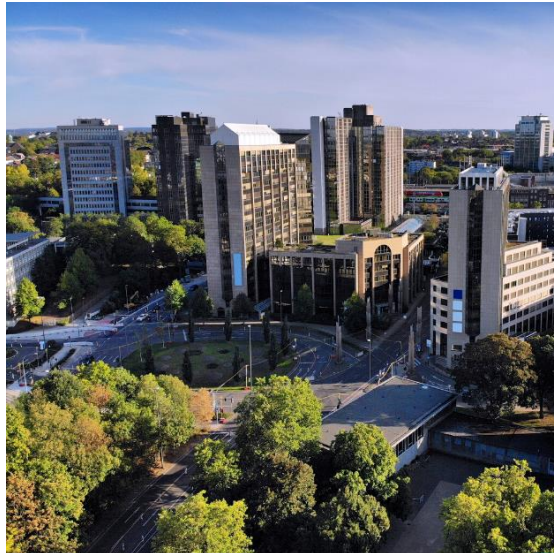
 27 Junio 2024
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