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sanitation
alliance

32nd SuSanA Meeting

Monday, 22nd August 2022

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Opening Plenary: Welcome everyone!

Moderator: Sareen Malik
(SuSanA Africa Chapter)

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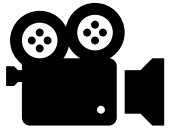
Etiquettes for Today‘s Meeting



The session will be recorded. If you do not agree with the recording, you can leave the meeting. **Slides and recordings** will be made **available after the meeting**.

Please turn your **microphones and videos off** whilst not speaking.

Please use the **chat function** to ask questions.

Keep to the time limit!

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Agenda – Part 1 (9:00 – 12:00 CEST)

Time (CEST)	Session	Presenter(s)
9:00 – 9:05	**Welcome and Opening**	Sareen Malik (SuSanA Africa Chapter)
9:05 – 9:15	**Keynote:** Link between WASH (productive sanitation systems and hygiene) and food security	Dr Björn Vinnerås (SLU)
9:15 – 9:45	**WG 05** Food security and productive sanitation systems	Linus Dagerskog (SEI), Dr Russel Chidya (Mzuzu University Malawi) & Pay Drechsel (IWMI)
9:45 – 10:15	**WG 06** Cities (Part 1)	Dorothee Spuhler & Abishek Sankara Narayan (WG 06)
10:15 – 10:30	Coffee & Tea Break	
10:30 – 11:15	**WG 06** Cities (Part 2): Future relevance & potential of wastewater surveillance (Covid-19, AMR, …)	Kate Medlicott (WHO), Tim Julian and Dorothee Spuhler (Eawag), Dr Said Rachida (NICD), Maria Ferreira (KWR) & Natalie Schmitz (GIZ)
11:15 – 11:45	**Decision support tools** for informed choices	Nitya Jacob (SuSanA India Chapter) & Dorothee Spuhler (Eawag)
11:45 – 12:00	Input from the **Africa Chapter**	Sareen Malik & Chaiwe Mushauko-Sanderse (SuSanA Africa Chapter)

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Agenda – Part 2 (13:00 – 17:00 CEST)

Time (CEST)	Session	Presenter(s)
13:00 – 13:25	**Updates from the Secretariat and on SuSanA 2.0**	SuSanA Secretariat & Alejandra Burchard Levine (ISC)
13:25 – 13:45	**WG 03** Climate Mitigation and Adaption	Thorsten Reckerzügl, Martin Kerres (WG 03), Juliet Willetts (UTS) & Jose Gesti (SWA)
13:45 – 14:30	**Speed Launches**	
14:30 – 14:45	Coffee & Tea Break	
14:45 – 15:00	**SuSanA forum moderation -** Updates and Way forward	Chaiwe Mushauko-Sanderse & Paresh Chhajed-Picha (Forum Moderators)
15:00 – 15:15	Input from the **Latin-America Chapter**	Lourdes Valenzuela (SuSanA Latin-America Chapter)
15:15 – 15:35	Introduction to the **WASH!Game** & **RECLAIM Game**	Belinda Abraham and Dennis Walter (Viva con Agua) & Jennifer McConville (SLU)
15:35 – 15:50	Coffee & Tea Break	
15:50 – 16:10	**WG 07** Sustainable WASH in Institutions and Gender Equality	Belinda Abraham & Bella Monse (WG 07)
16:10 – 16:55	**Papers to practice:** GHG emissions from different sanitation systems	Laura Kohler & Dorothee Spuhler (WG 01)
16:55 – 17:00	**Closing**	Arne Panesar and Sareen Malik

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Part 1

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Keynote:

Link between WASH (productive sanitation systems and hygiene) and food security

Prof. Björn Vinnerås (SLU)


SLU
SCIENCE AND EDUCATION FOR SUSTAINABLE LIFE

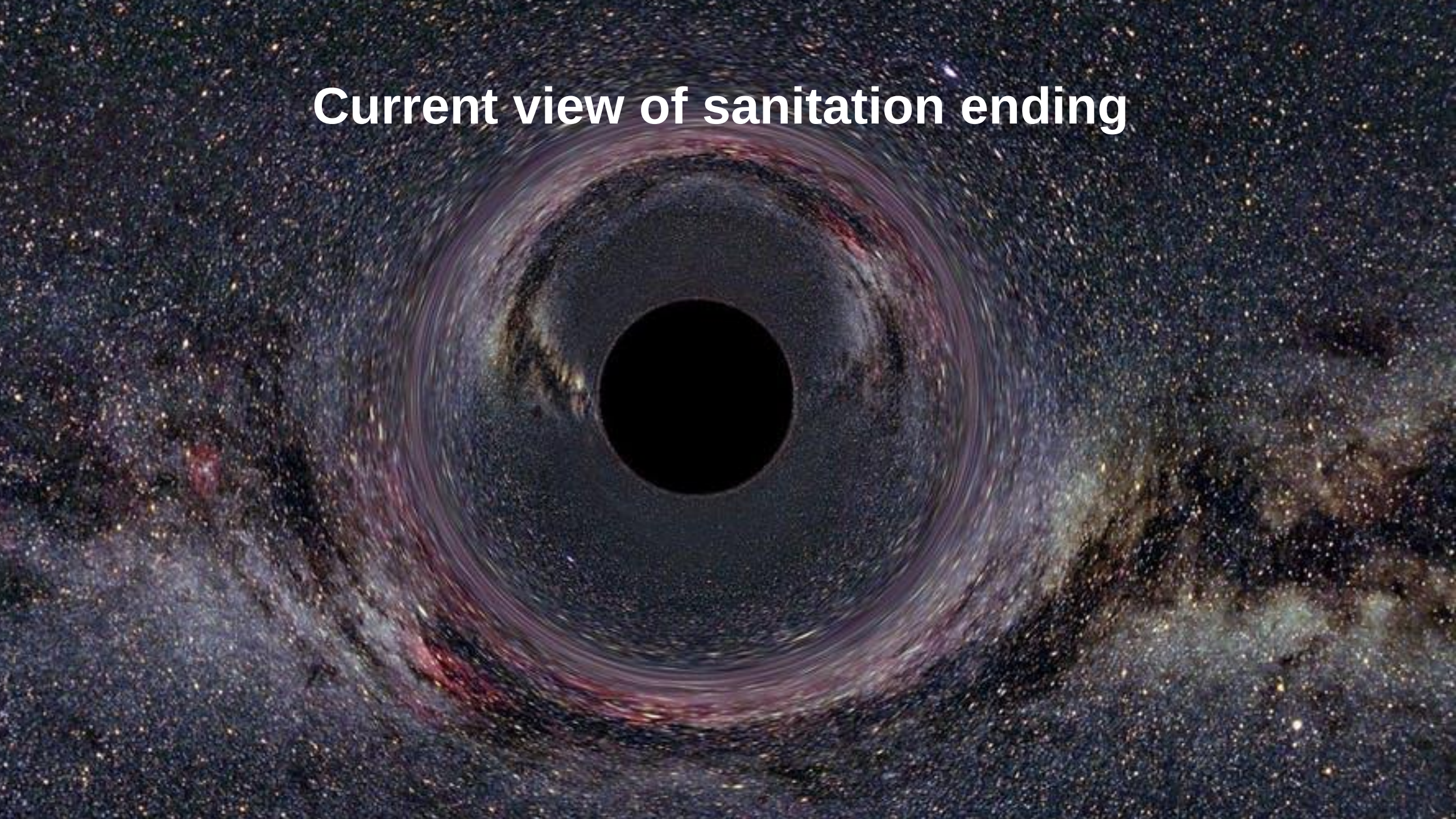
Link between WASH (productive sanitation systems and hygiene) and food security

Dr Björn Vinnerås Professor in Environmental Engineering
Swedish university of agricultural sciences

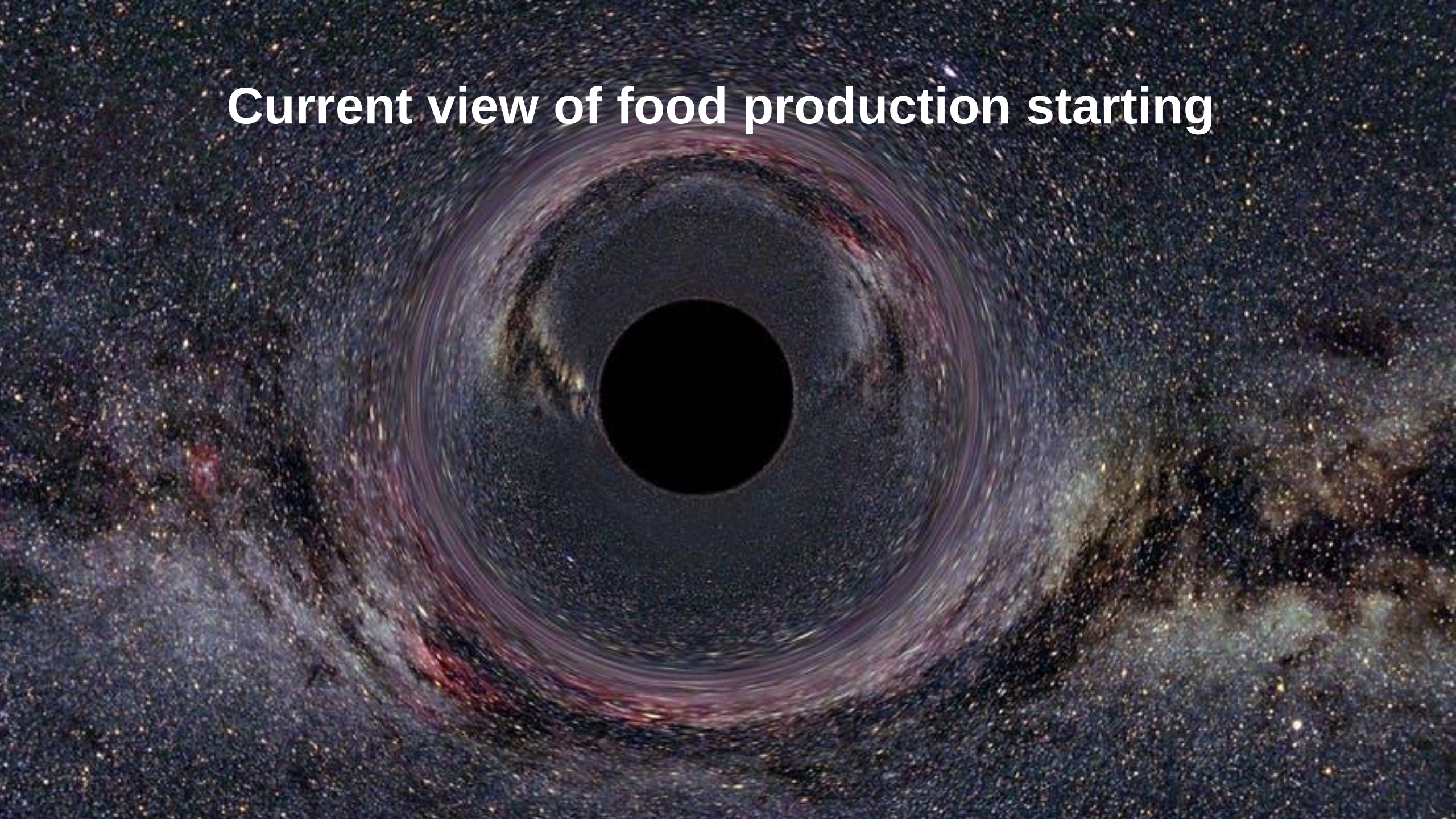
Why is there a link

- Mass balance – All biological elements are present here and now
- Forms of the elements may vary → as well as availability
- Change in entropy when used in agriculture

Current view of sanitation ending



Current view of food production starting

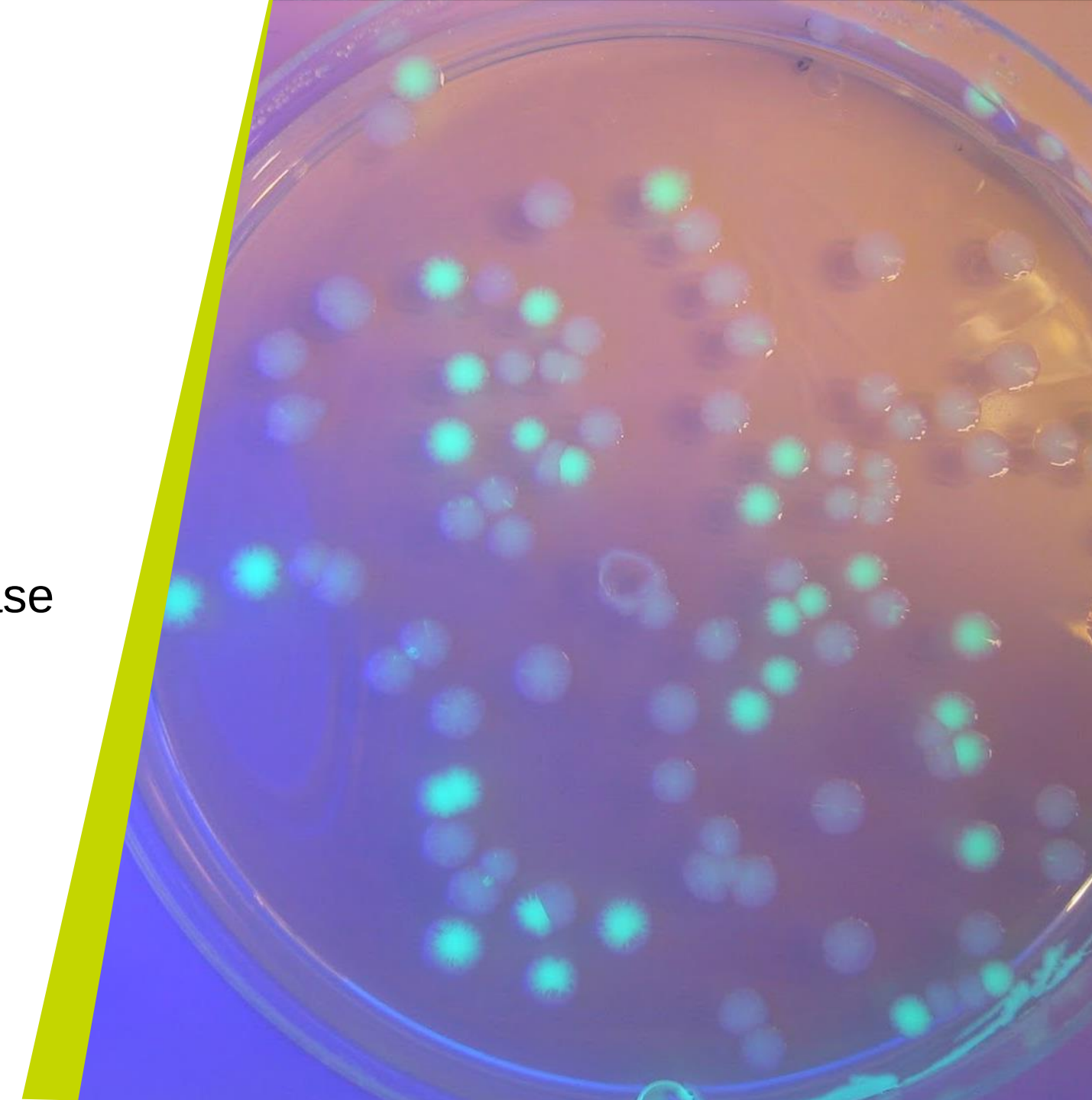


Food production / food security - vision

Actual situation

Hygiene

- Main driver to linear systems
  - Sanitation
  - Food
- Result in increased risk for disease transmission
- Closing the loop
  - Concentrated fractions
  - Controlled collection and reuse




Treatment


Agriculture

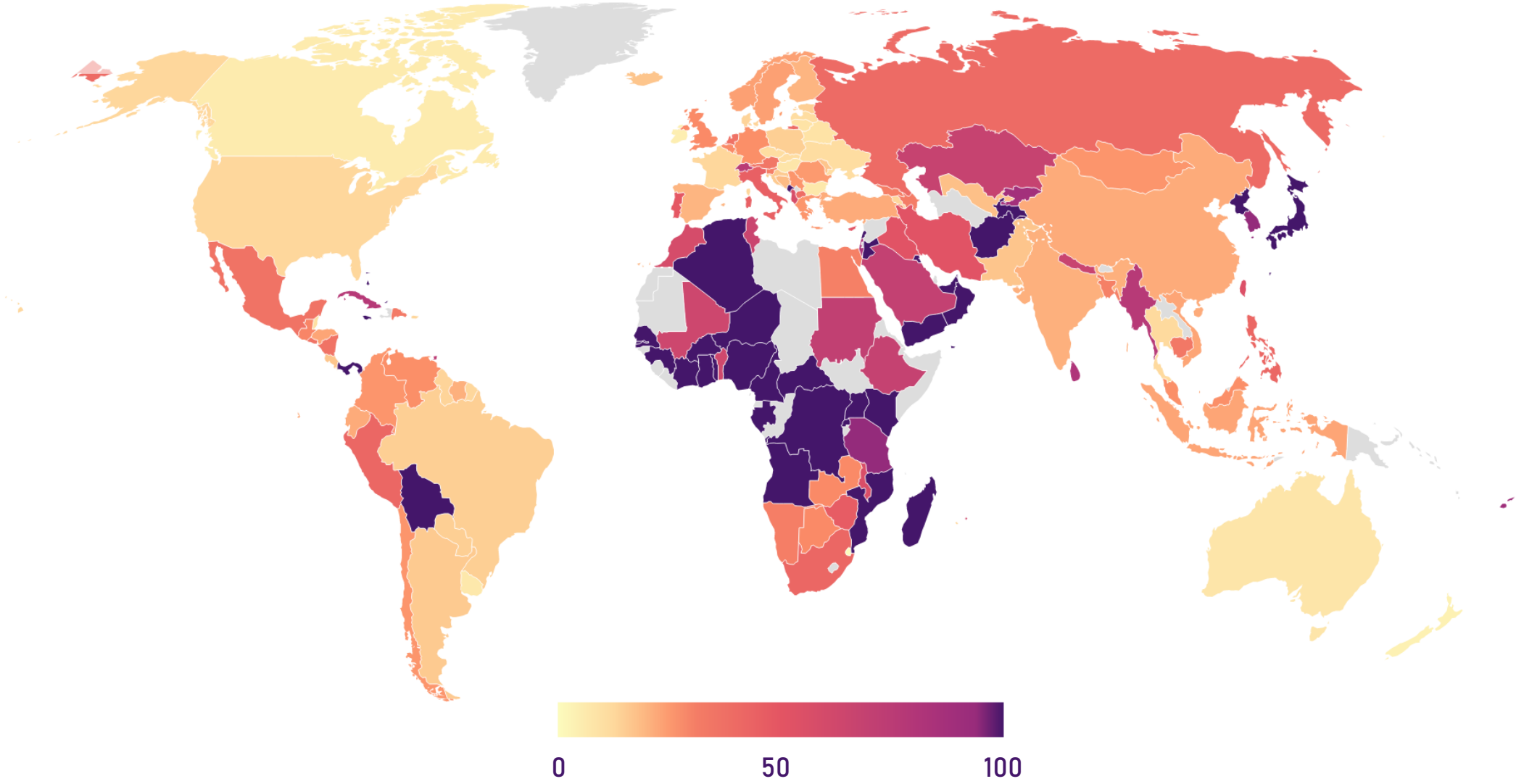

Food


Toilet

What happens if we close the loop?

- We have to look at full chain
- We stop pollution
  - Pathogens
  - Micro pollutants
  - Eutrophication
- Increase resilience
  - Water
  - Plant nutrients

Replacing Synthetic Nitrogen (HABER-BOSCH)



Slide by Prithvi Simha

Author Created using Datawrapper; Data: FAOSTAT 2020 & Jonsson & Vinnerås, 2004

Full chain needs to be included

Conclusion

- By closing the loop
  - Decreased pollution
  - Increased resilience
    - 25% of global nutrients can be replaced
- Focus should be on
  - Useful products
  - Resource recovery
  - Large scale implementation
- Fertilisers available for all

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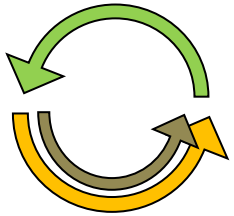
WG 05:
Food security and productive sanitation systems

Linus Dagerskog (SEI)
Dr Russel Chidya (Mzuzu University Malawi)
Pay Drechsel (IWMI)

Productive sanitation and food security session



- Some examples and some lessons learnt

SEI Stockholm Environment Institute

Linus Dagerskog
Research Fellow
2022-08-22

Session outline

Foto: J. Robertson www.flickr.com/photos/jrob/3228042128/in/photostream/

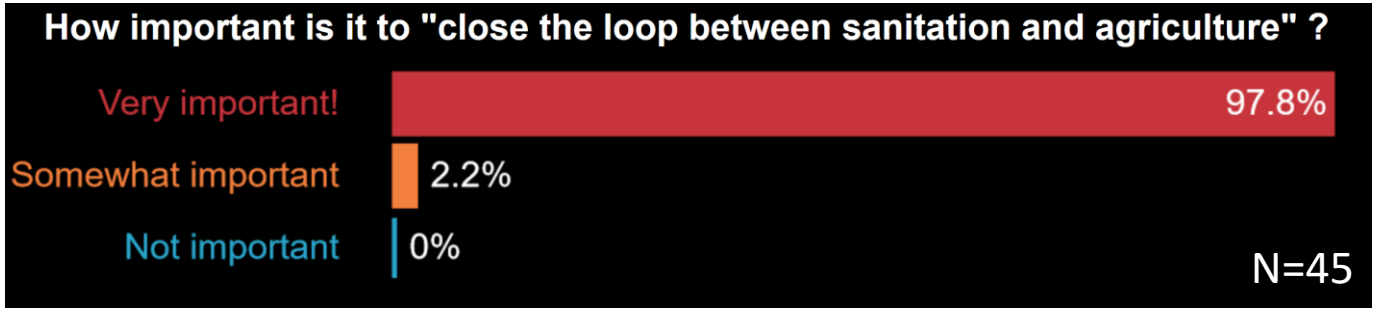
1) Linus

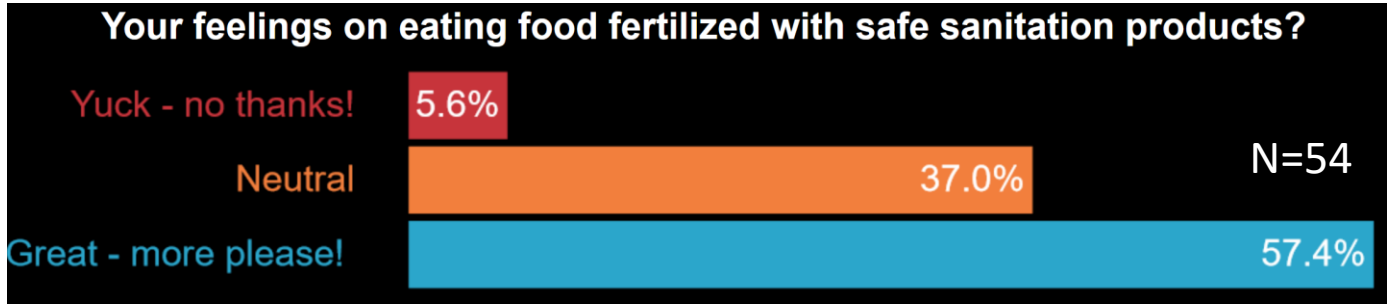
- Interactive poll on reuse
- Overview Clean and Green Village framework

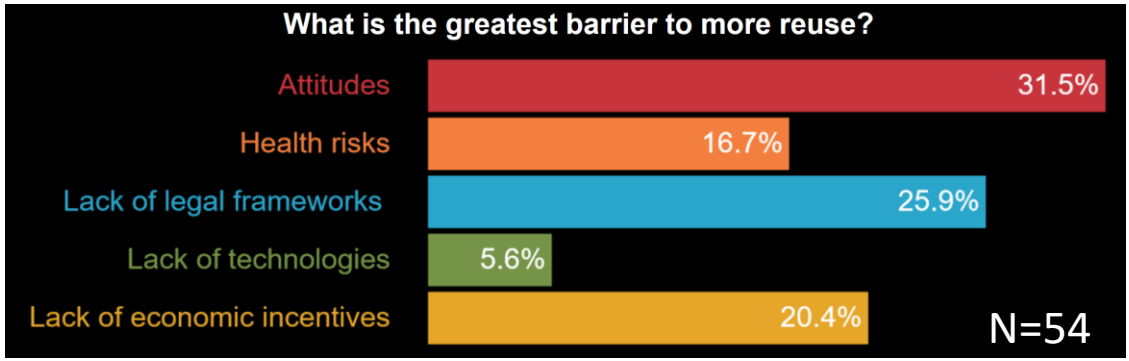
2) Dr Russel Chidya, Mzuzu Uni. Malawi – Ecological sanitation initiative in Lilongwe

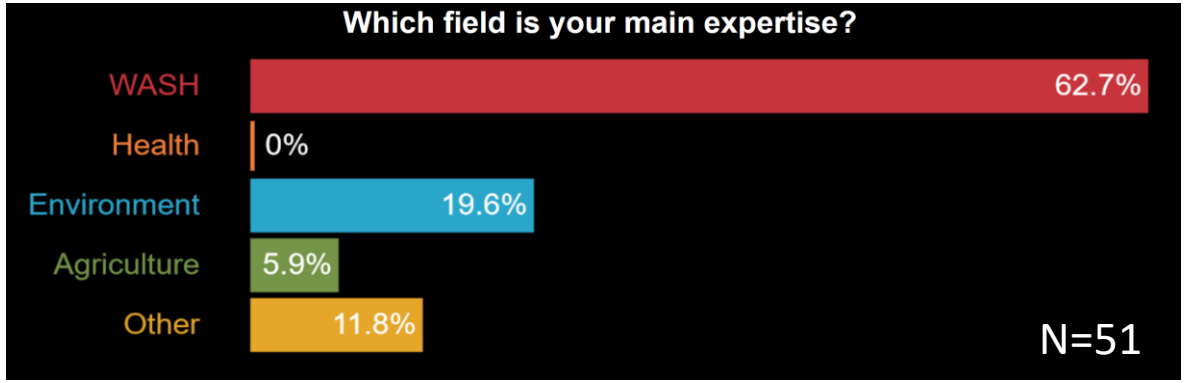
3) Dr Pay Drechsel, IWMI, Sri Lanka: Reflections from RRR experiences in Asia and Africa

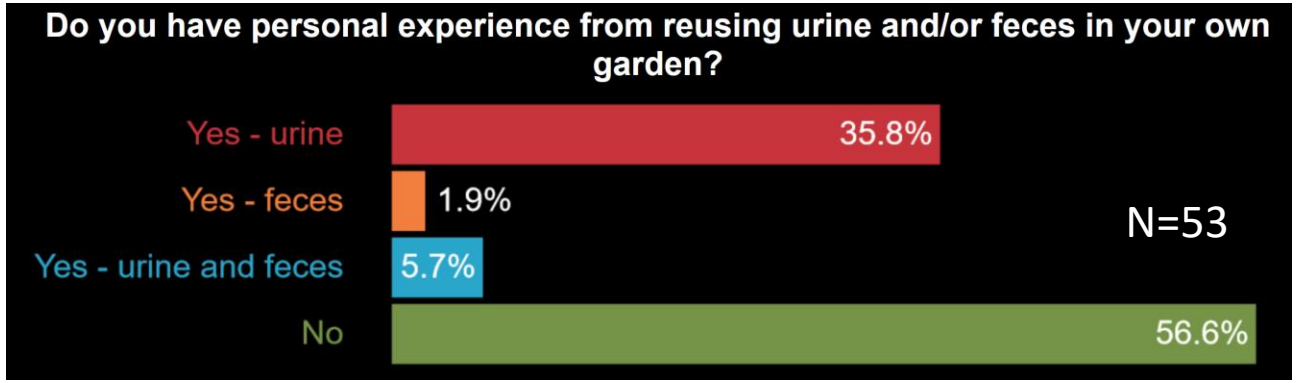
Interactive poll with session participants (using www.directpoll.com)











Reuse potential in rural and urban contexts

- **RURAL AREAS = 500 million smallholder farms**

  → Awareness + safe, affordable and acceptable methods

- **URBAN AREAS = ”Man-made nutrient mines”**

  → Technologies, business models, policies/legal frameworks and acceptance by farmers and consumers

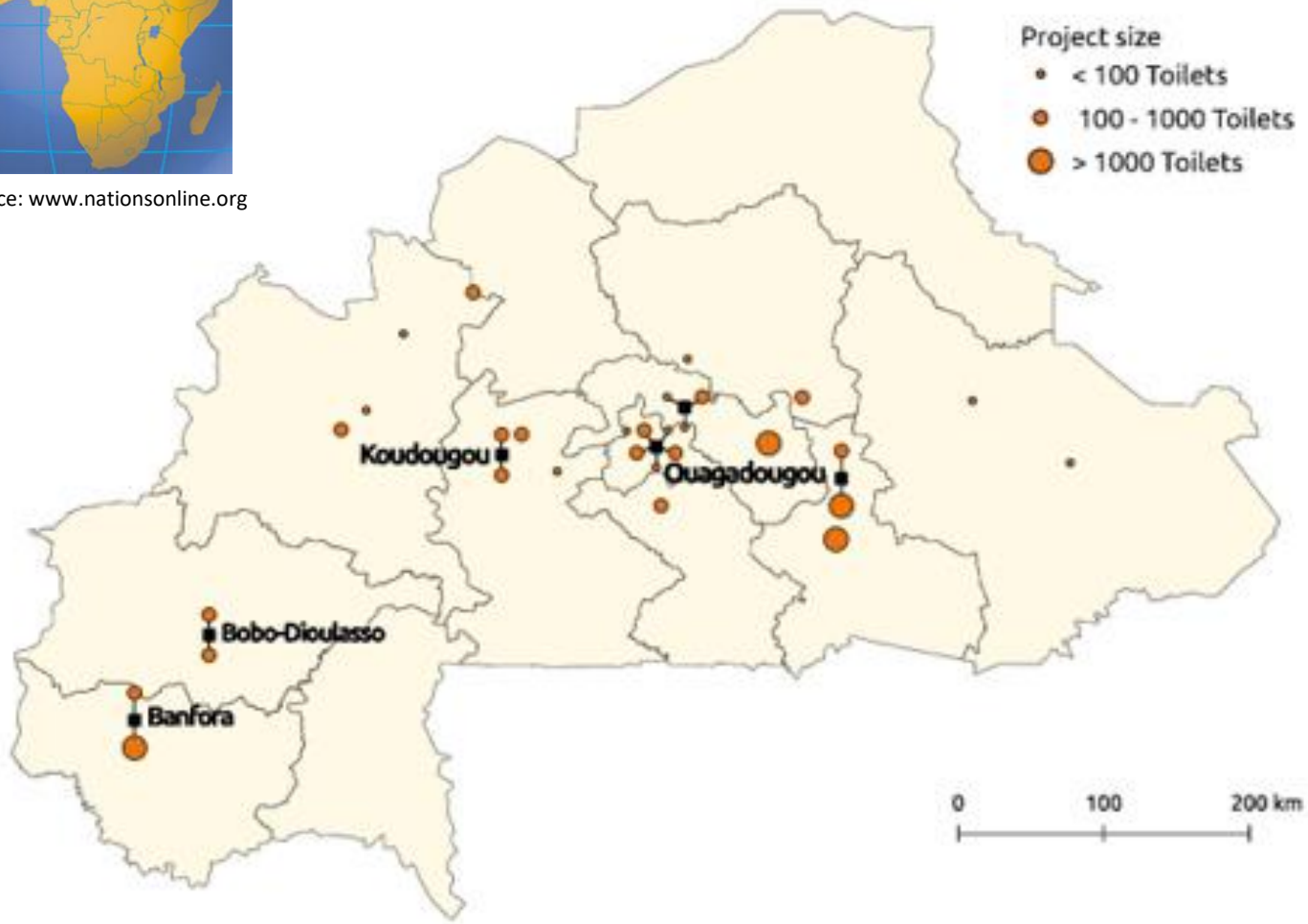
  Requires capacity, cooperation across sectors and a paradigm shift in minds, systems and institutions...

Urine fertilized millet in Aguié, Niger

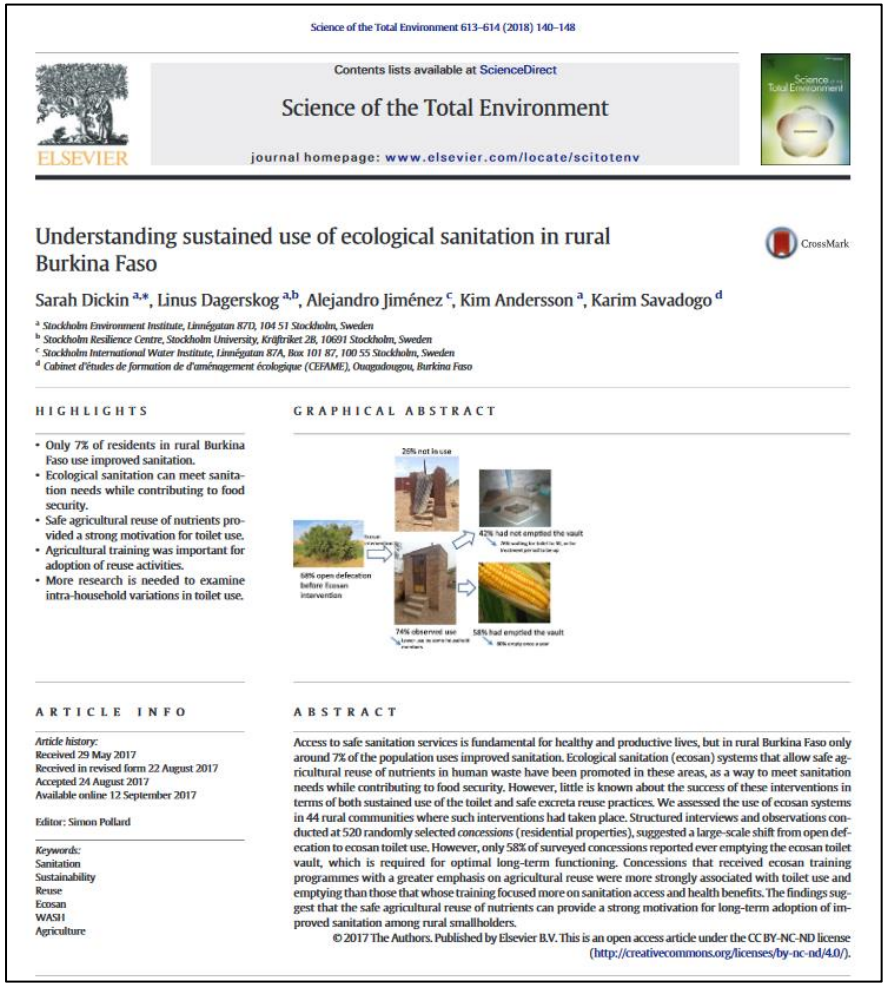
Ecological sanitation in Burkina Faso 2003-2019

- > 30 projects
- > 13 500 households

Source: www.nationsonline.org



Sustainability of outcomes at three major sites (3-8 years post project)



Science of the Total Environment 613–614 (2018) 140–148

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Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

Understanding sustained use of ecological sanitation in rural Burkina Faso

Sarah Dickin [a,*], Linus Dagerskog [a,b], Alejandro Jiménez [c], Kim Andersson [a], Karim Savadogo [d]

[a] Stockholm Environment Institute, Linnégatan 87D, 104 51 Stockholm, Sweden
[b] Stockholm Resilience Centre, Stockholm University, Kräftriket 2B, 10691 Stockholm, Sweden
[c] Stockholm International Water Institute, Linnégatan 87A, Box 101 87, 100 55 Stockholm, Sweden
[d] Cabinet d'études de formation de d'aménagement écologique (CEFAME), Ouagadougou, Burkina Faso

HIGHLIGHTS

- Only 7% of residents in rural Burkina Faso use improved sanitation.
- Ecological sanitation can meet sanitation needs while contributing to food security.
- Safe agricultural reuse of nutrients provided a strong motivation for toilet use.
- Agricultural training was important for adoption of reuse activities.
- More research is needed to examine intra-household variations in toilet use.

GRAPHICAL ABSTRACT

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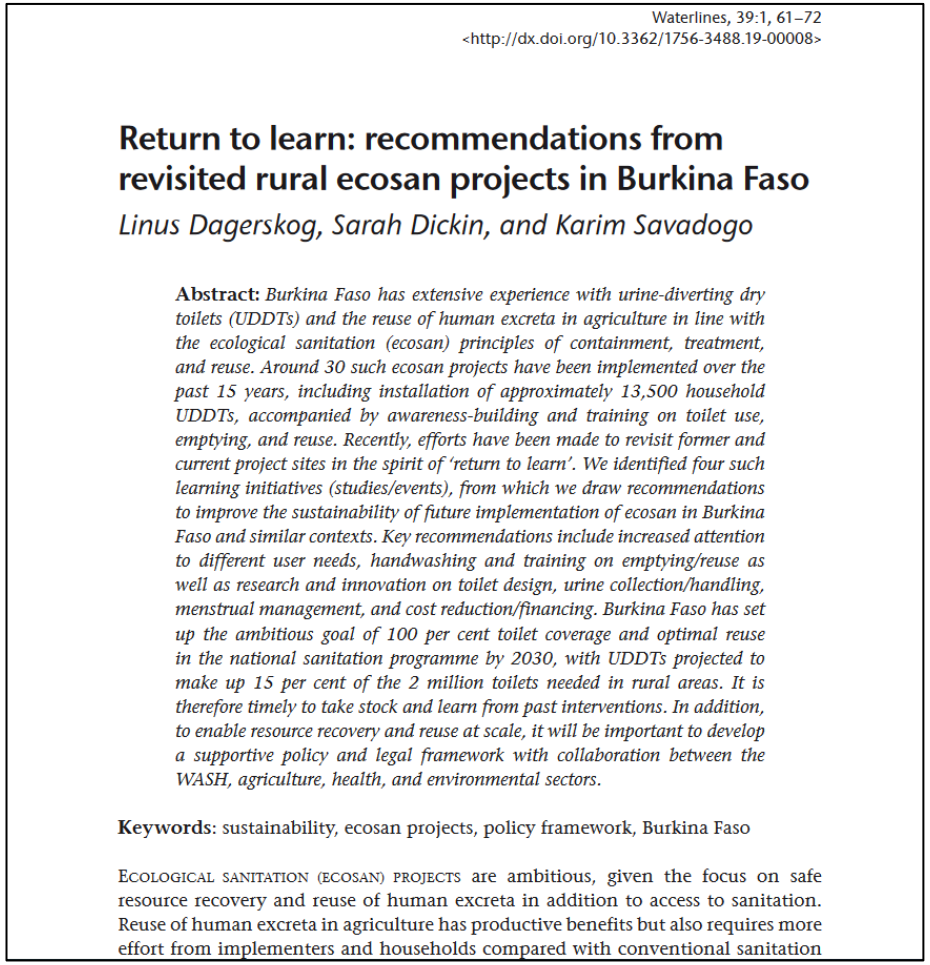
WASH
Agriculture

ABSTRACT

Access to safe sanitation services is fundamental for healthy and productive lives, but in rural Burkina Faso only around 7% of the population uses improved sanitation. Ecological sanitation (ecosan) systems that allow safe agricultural reuse of nutrients in human waste have been promoted in these areas, as a way to meet sanitation needs while contributing to food security. However, little is known about the success of these interventions in terms of both sustained use of the toilet and safe excreta reuse practices. We assessed the use of ecosan systems in 44 rural communities where such interventions had taken place. Structured interviews and observations conducted at 520 randomly selected *concessions* (residential properties), suggested a large-scale shift from open defecation to ecosan toilet use. However, only 58% of surveyed concessions reported ever emptying the ecosan toilet vault, which is required for optimal long-term functioning. Concessions that received ecosan training programmes with a greater emphasis on agricultural reuse were more strongly associated with toilet use and emptying than those that whose training focused more on sanitation access and health benefits. The findings suggest that the safe agricultural reuse of nutrients can provide a strong motivation for long-term adoption of improved sanitation among rural smallholders.

https://pubmed.ncbi.nlm.nih.gov/28910716/



Waterlines, 39:1, 61–72
<http://dx.doi.org/10.3362/1756-3488.19-00008>

Return to learn: recommendations from revisited rural ecosan projects in Burkina Faso

Linus Dagerskog, Sarah Dickin, and Karim Savadogo

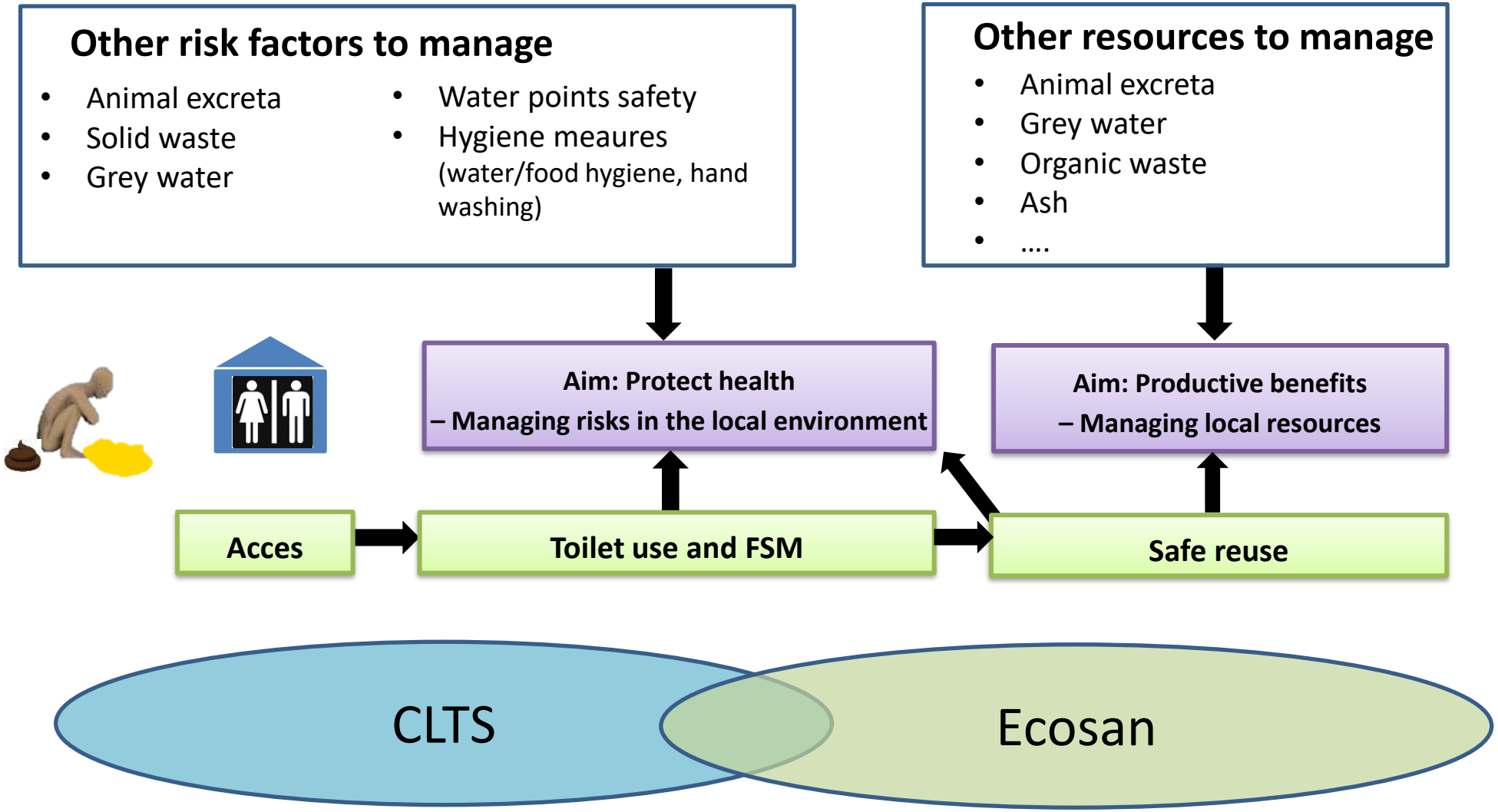
Abstract: *Burkina Faso has extensive experience with urine-diverting dry toilets (UDDTs) and the reuse of human excreta in agriculture in line with the ecological sanitation (ecosan) principles of containment, treatment, and reuse. Around 30 such ecosan projects have been implemented over the past 15 years, including installation of approximately 13,500 household UDDTs, accompanied by awareness-building and training on toilet use, emptying, and reuse. Recently, efforts have been made to revisit former and current project sites in the spirit of 'return to learn'. We identified four such learning initiatives (studies/events), from which we draw recommendations to improve the sustainability of future implementation of ecosan in Burkina Faso and similar contexts. Key recommendations include increased attention to different user needs, handwashing and training on emptying/reuse as well as research and innovation on toilet design, urine collection/handling, menstrual management, and cost reduction/financing. Burkina Faso has set up the ambitious goal of 100 per cent toilet coverage and optimal reuse in the national sanitation programme by 2030, with UDDTs projected to make up 15 per cent of the 2 million toilets needed in rural areas. It is therefore timely to take stock and learn from past interventions. In addition, to enable resource recovery and reuse at scale, it will be important to develop a supportive policy and legal framework with collaboration between the WASH, agriculture, health, and environmental sectors.*

Keywords: sustainability, ecosan projects, policy framework, Burkina Faso

ECOLOGICAL SANITATION (ECOSAN) PROJECTS are ambitious, given the focus on safe resource recovery and reuse of human excreta in addition to access to sanitation. Reuse of human excreta in agriculture has productive benefits but also requires more effort from implementers and households compared with conventional sanitation

https://practicalactionpublishing.com/pdfjs/web/viewer.html?file=https://practicalactionpublishing.com/pdf/article/2464/10_3362_1756_3488_19_00008_01661002553.pdf

Rural sanitation: Towards integrated risk and resource management



Clean and Green Village

Clean and Green village framework

Piloting in Burkina Faso 2020 - mid 2023

		☺	😐	☹
Clean components				
1. Toilet use and FSM	(9 indicators)			
2. Solid waste mgmt.	(6 indicators)			
3. Animal excreta mgmt.	(6 indicators)			
4. Greywater mgmt.	(1 indicator)			
5. Water mgmt.	(5 indicators)			
6. Handwashing	(5 indicators)			
7. Food hygiene	(4 indicators)			
Summary				
Green components				
1. Human urine	(6 indicators)			
2. Human faeces	(6 indicators)			
3. Animal faeces	(5 indicators)			
4. Animal urine	(3 indicators)			
5. Greywater	(2 indicators)			
6. Wood ash	(2 indicators)			
7. Other organic waste	(3 indicators)			
Summary				

Practice what you preach…

THANK YOU!

linus.dagerskog@sei.org

Empowering Rural Communities through Ecological and Sustainable WASH Practices in Lilongwe, Malawi: a Review

R. Chidya[a*];

B. Chunga[a]; W. Chipeta[a]; S. Matamula[a]; E. Mtonga[a]

Contact: [a*]**Dr Russel Chidya** (PhD)
russelchidya@gmail.com.

Department of Water and Sanitation (DWAS)

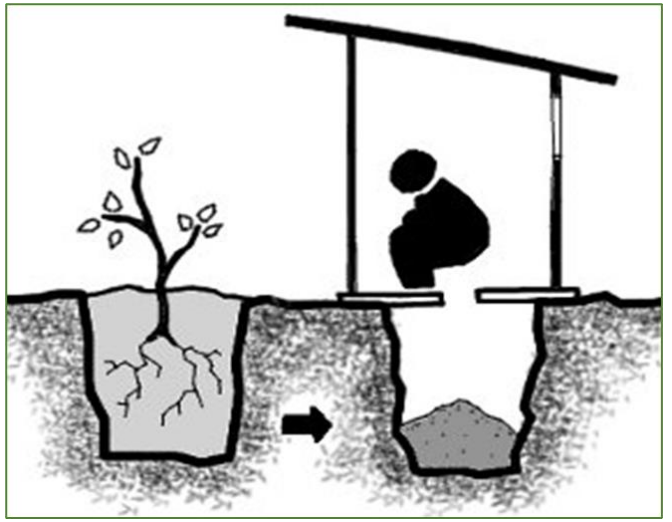
Centre of Excellence in Water and Sanitation (WATSAN)

Faculty of Environmental Sciences, Mzuzu University, P/Bag 201, Mzuzu 2.
Malawi

1.0 Background

- The UN agenda 2030 Sustainable Development Goal (SGD) 6 aims at achieving equitable water and sanitation for all.
- This is in line with Malawi's framework guiding the WASH sector.
- The National Water Policy of 2005 and the National Sanitation Policy of 2008, for example, advocate for inclusive approaches to service delivery in WASH.
- Of the 17 million people living in Malawi, about 33% do not have access to improved sanitation.

- Despite reduced uptake, low cost Ecological Sanitation programs in Malawi have led to improved sanitation.
- Improved agricultural production using eco-san toilet driven composts is believed to provide the required finance to private sector (masons) and households
- However scaling-up sustainable and eco-san toilets is a complex process due to social norms/taboos, poverty levels, and lack of expertise & technical aspects.



Arborloo latrine (Photo: Eawag, R. Gensch & N. Sacher)

Sky Loo Latrine at Mzuzu University WATSAN
(Photo: C. Zimba/B. Chidya)

2.0 Project Aim

- Habitat for Humanity Malawi and its partner Habitat for Humanity Germany is implementing a project entitled *"Empowering Rural Communities in the Lilongwe District of Malawi to Achieve Better Health and Quality of Life through Sustainable WASH Practices"*.

Specific project objectives (selected)

a) To design and implement ecosan technologies suitable for rural areas
b) To promote ecological and *Sustainable WASH Practices in the study area*
c) To implement the capacity development and WASH advocacy and marketing activities,

Aim of this Study (review)

- *This study was aimed at evaluating the implementation of the a WASH Project by Habitat for Humanity in* Traditional Area (TA) Masumbankhunda, in Lilongwe Malawi.

Methodology

- The project is being implemented in TA Masumbakunda – Lilongwe (since 2021).
- The (review) study used qualitative method to evaluate the implementation of the project.
- Data was collected through document review and literature search

Fig. Map of Malawi showing Lilongwe

Findings and Discussion

To promote and upscale the Ecosan and Sanitation technologies in the area, **10 Masons** were selected and trained

- Mandauka D. Wandawanda
- Notice Marko
- Grevazio F. Kabande
- Felium Chalera
- Elvis K. Chamkondo
- Joly P. Kodole
- Allan A. Time
- Madalitso Sonjo Mafelo
- Cosmas Fisher
- Patrick Matikiti

Processes – Training and Sanitation marketing

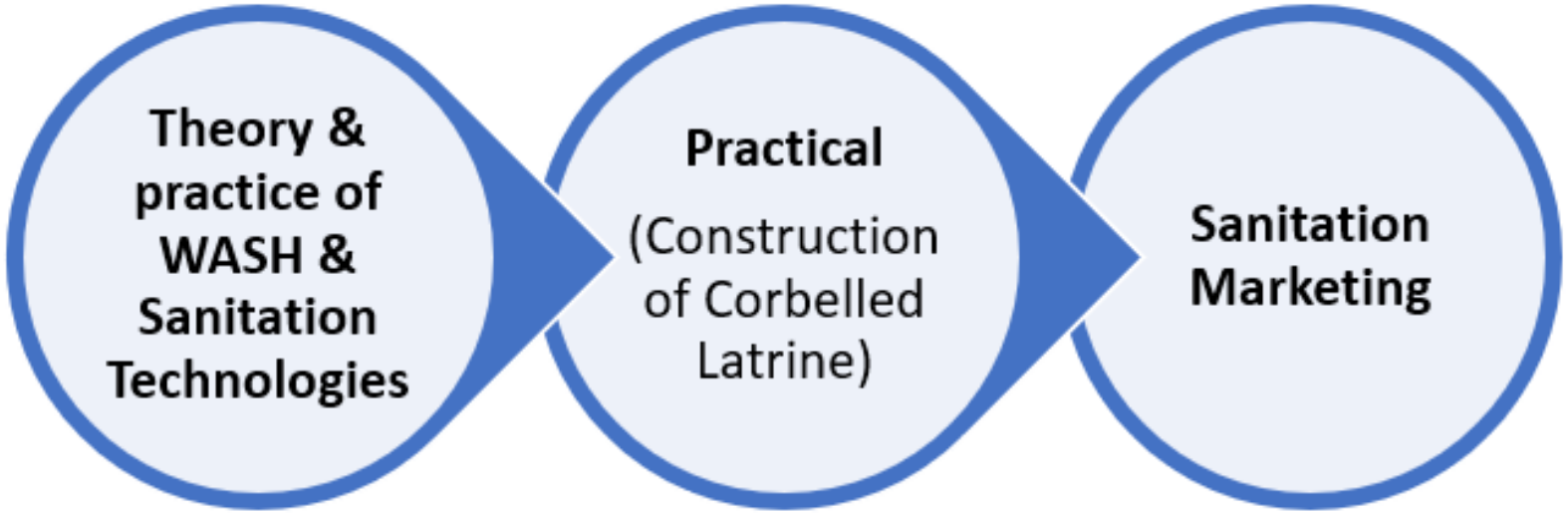


Figure 1: Processes – Training and Sanitation marketing

Areas masons were trained

A). The Theory & Practice of WASH & Sanitation Techn..:

- ✓ Introduction to the WASH and public Health
- ✓ Introduction to Water and Sanitation related diseases
  - Disease transmission route – F diagram
  - Role of Low-cost Sanitation technologies in preventing WASH diseases
- ✓ Legal Framework and Institutional arrangement in WASH (Policies, SGD 6)
- ✓ Sanitation Marketing Approaches
- ✓ Introduction to Low-cost Sanitation Technologies
- ✓ Ecosan Latrines (Fossa Aterna, Aborloo and Skyloo)
- ✓ The theory behind Corbelled Latrines
  - Challenges faced in Latrine construction
  - Technical design & criteria used to construct low-cost latrines
  - Significance of low-cost latrines
  - Site selection
  - Theory behind construction

Figure 3: Pictures showing participants

b) Practical – construction of the corbelled latrine

1. Site selection and pit digging

2. Lining the walls (substructure)

3. Finishing top part & drop-hole

4. Superstructure construction

Learning Points

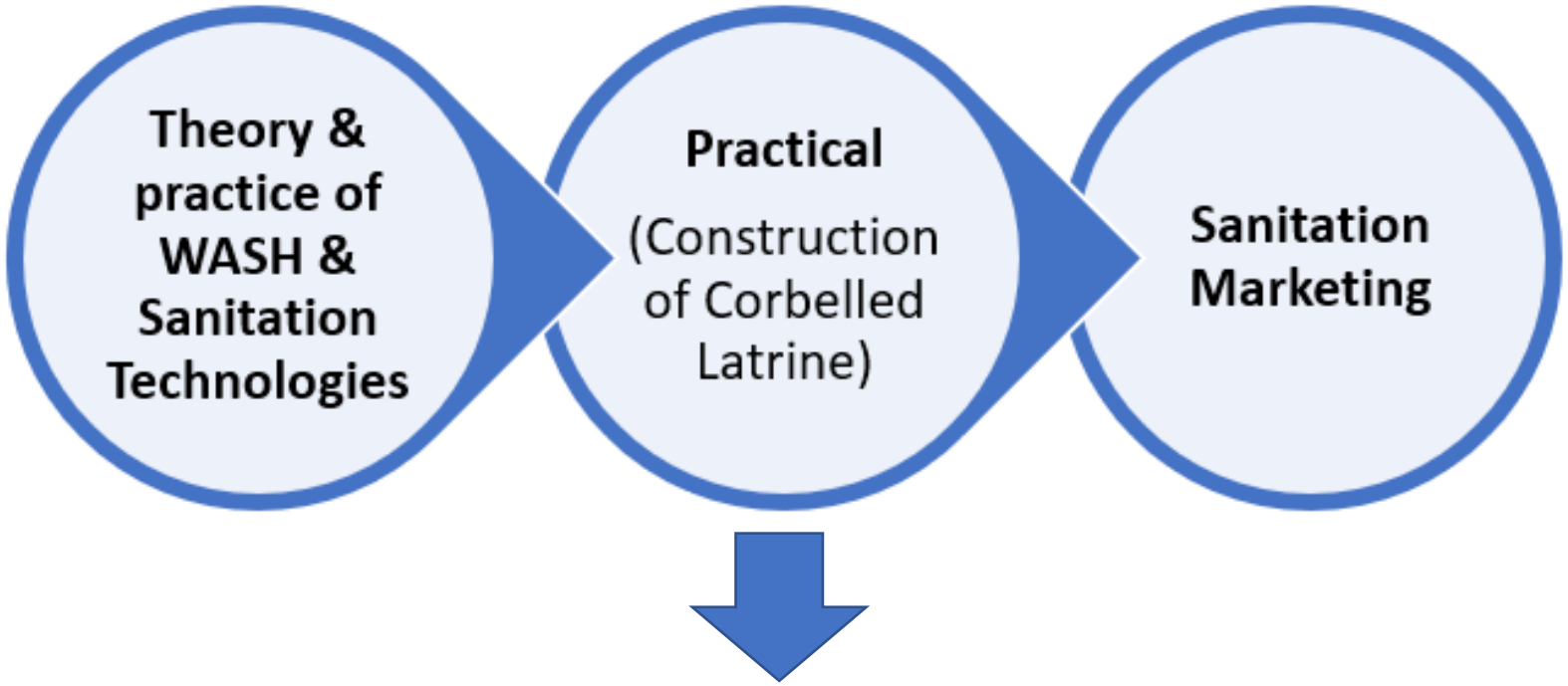
- Teaching masons the theory & sanitation marketing was key
- Monitoring and evaluation of the project important
- Motivation of the masons was key to ensure success of the project

  e.g. provision of PPES like safety clothing, gumboots, helmets, building equipment.

Lessons and Challenges in upscaling the Sanitation technologies in Rural areas

a) Some Households unwilling to pay for the sanitation services
b) Loose soils in some areas fail to support Corbelled Latrines and ecosan toilets
c) High water table in some areas
d) Masons charging high costs per latrine
e) Some masons fail to follow standards during latrine construction
f) Relatively high prices in raw materials (bricks, cement, roofing sheets etc)
g) Business model requires advocacy: some households request for donations
h) Low female participation in toilet/latrine construction & promotion

Next Course of actions for the project



To construct and promote Ecosan Toilets for urine and faecal sludge harvesting

Acknowledgments

Closing nutrient loops:
From theory to praxis, failures, and successes

Pay Drechsel

International Water Management Institute

sustainable sanitation alliance

32nd virtual SuSanA Meeting, 22 August 2022

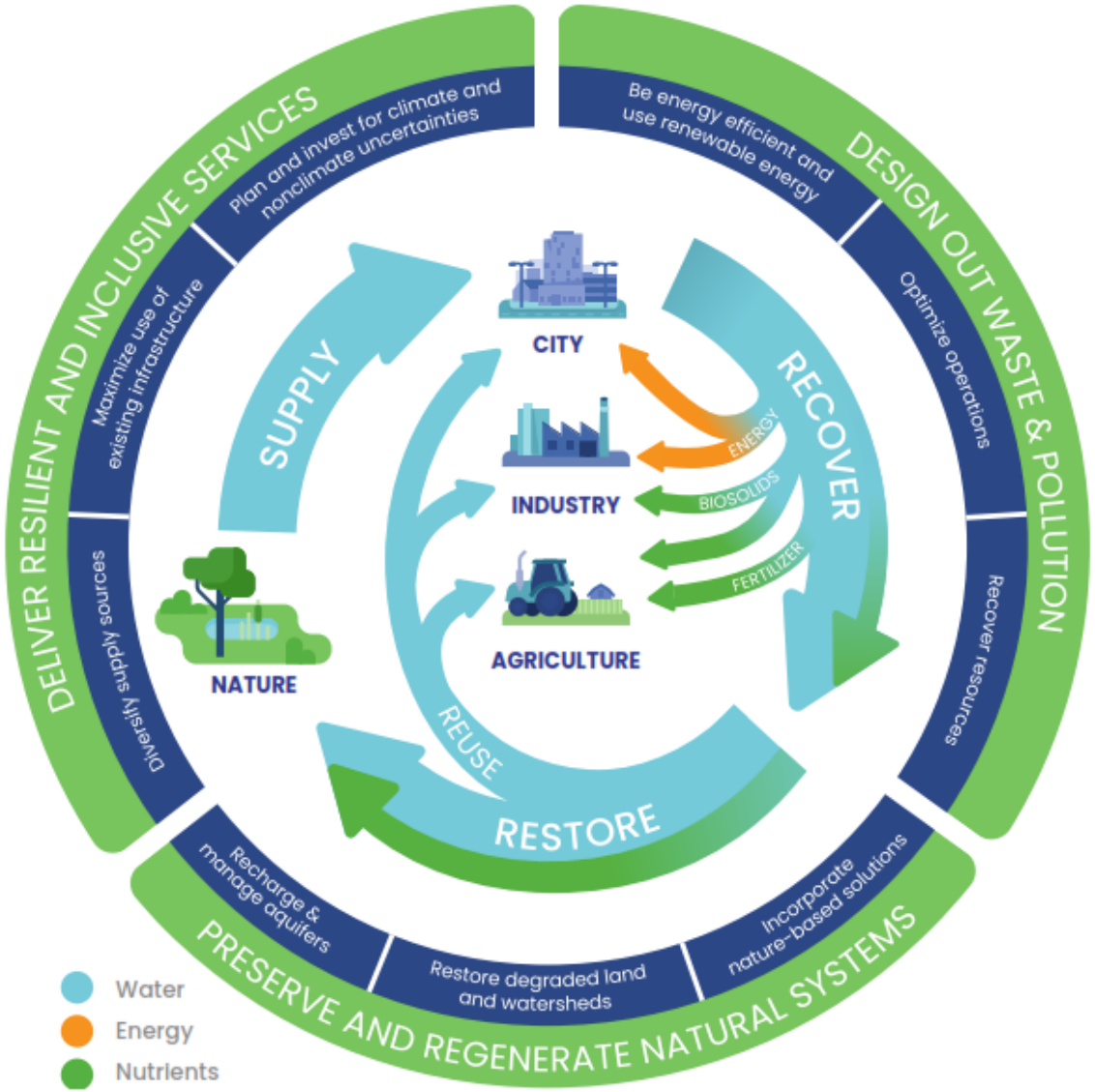
International Water Management Institute

CONTENT

1. Preamble
2. Three examples of our work
3. New CGIAR initiative

Circular Bio-Economy

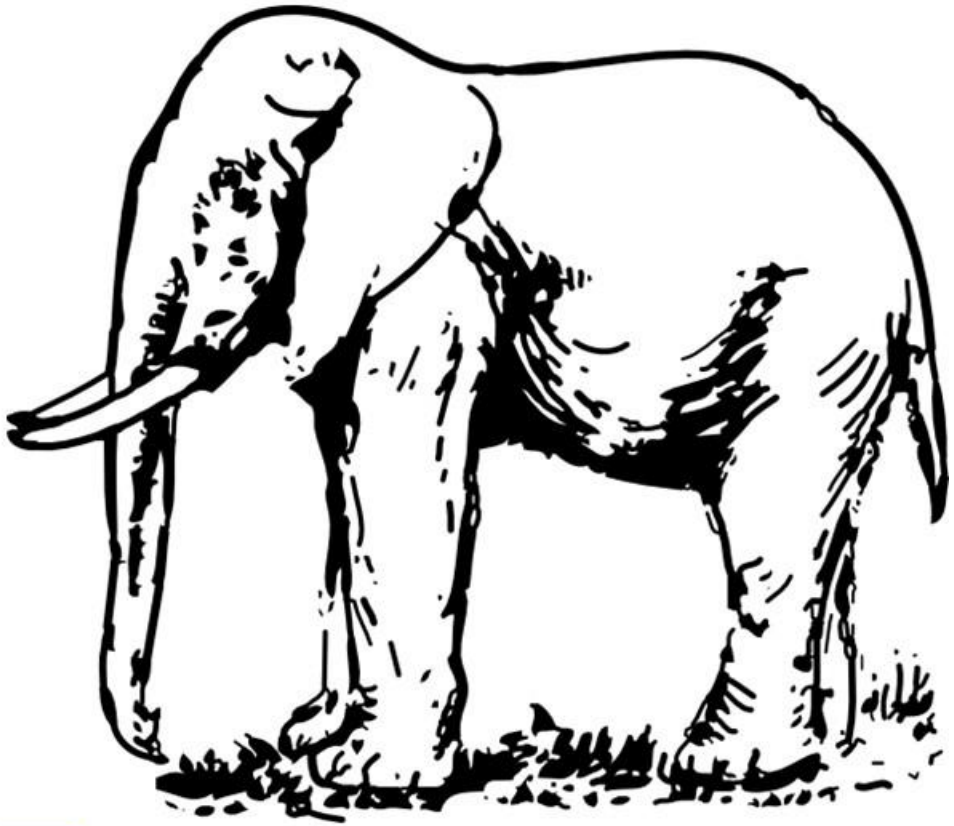
Resource Recovery & Reuse (RRR)



Graphic: https://openknowledge.worldbank.org/handle/10986/36254

From Guinea Pigs and White Elephants

Pay Drechsel



“Learning from #Fails in Water and Energy”; Stockholm WWW 2014

WHITE ELEPHANTS

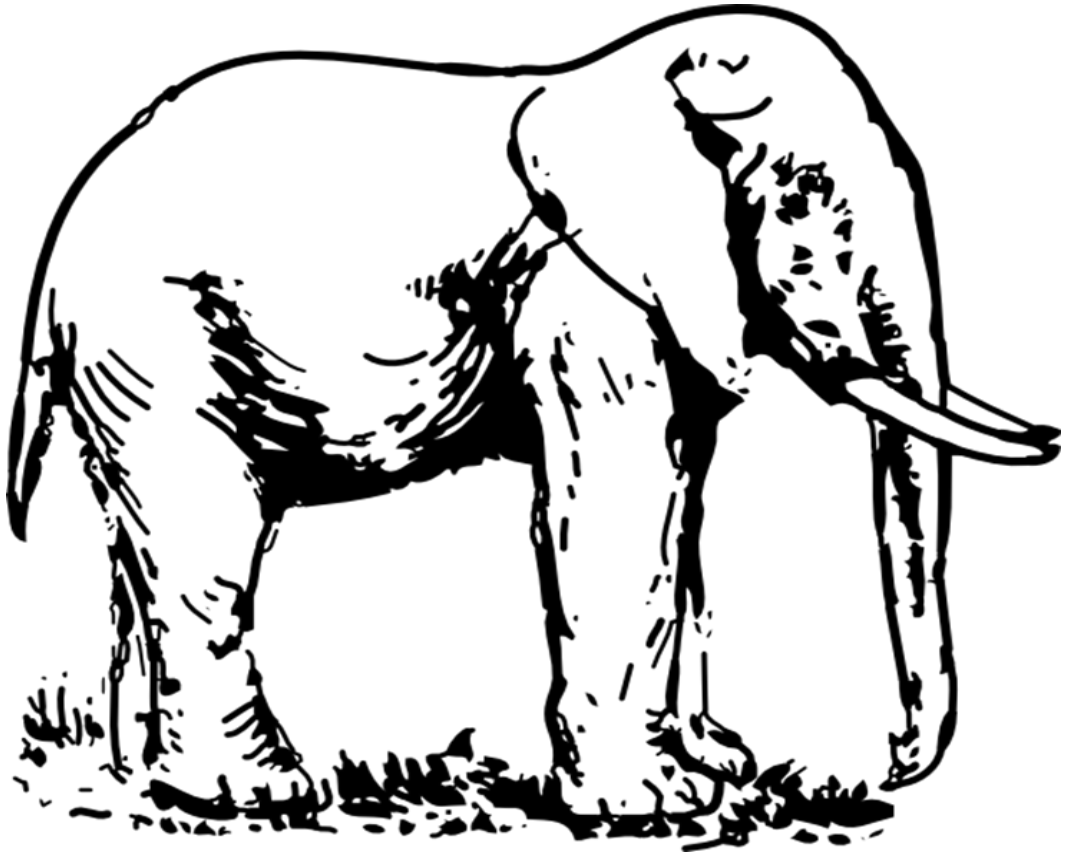
1980 - 2010
Fully mechanized compost plant in Accra, Ghana: lack of electricity, water, and trained staff resulted after a few years in a breakdown.


1999-2002/3
2017 rehabilitated

HOW FAR ARE WE RESEARCHERS ABLE TO DO BETTER ON THE “IMPACT PATHWAY” ?

CGIAR

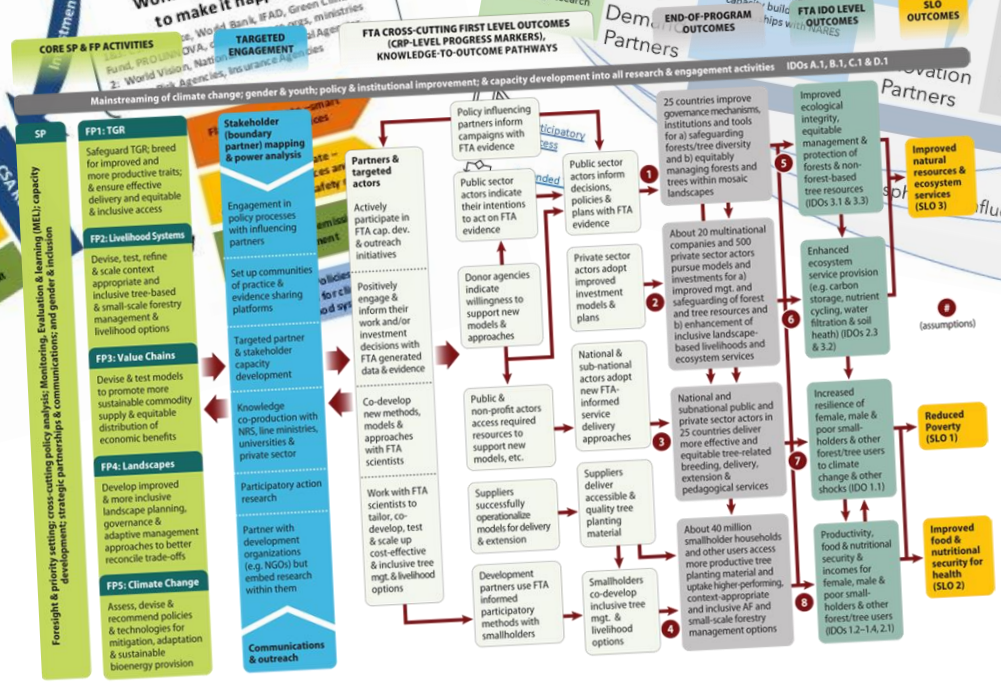
CGIAR is a global research partnership for a food-secure future dedicated to transforming food, land, and water systems in a climate crisis.

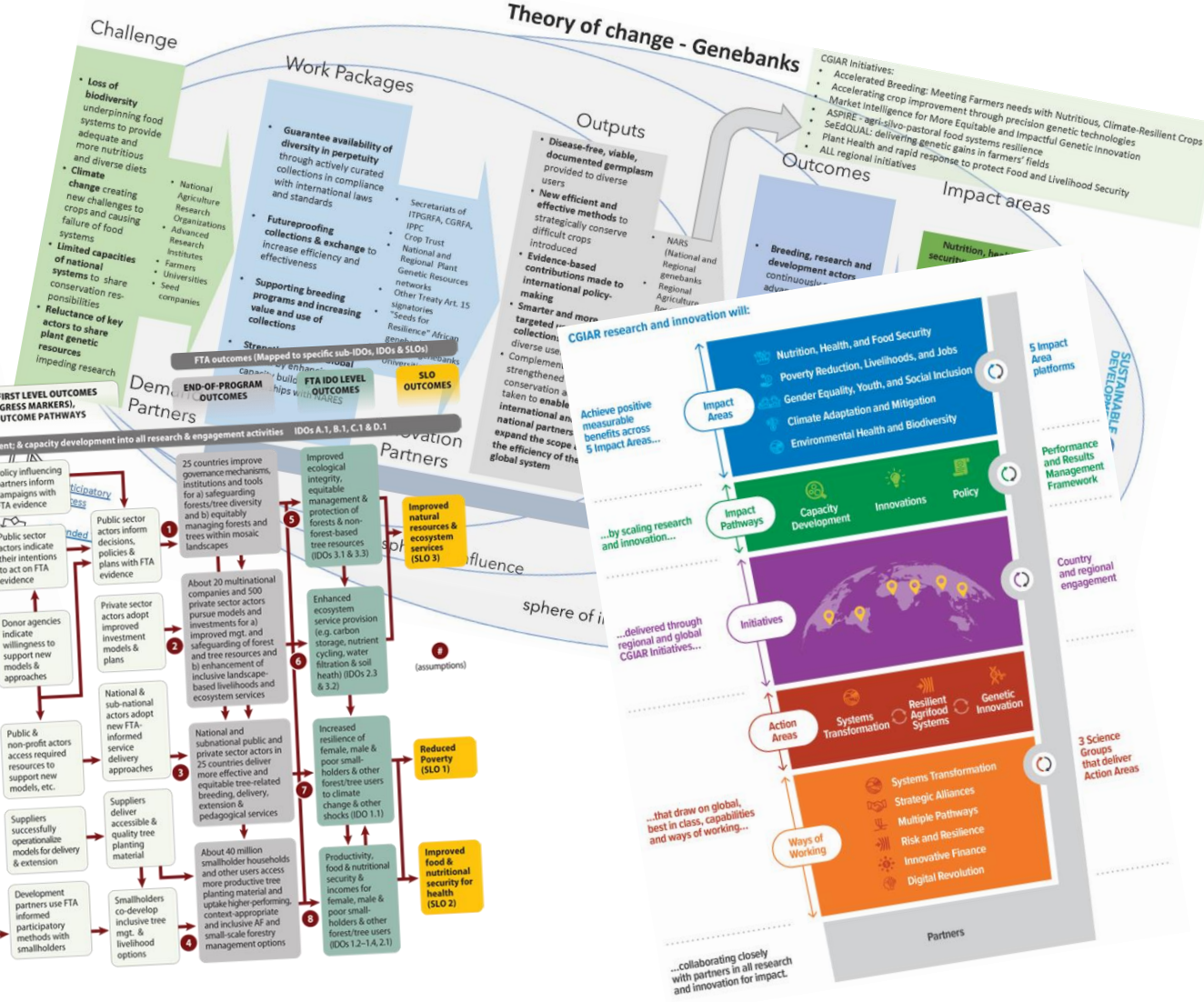


IWMI
International Water Management Institute

IWMI is a CGIAR Research Center with offices in 13 countries and a global network of scientists operating in more than 30 countries to provide water solutions for sustainable, climate-resilient development.

THEORIES OF CHANGE - SCALING FRAMEWORKS





"I see journal articles, patents, legal fees and then... nothing."

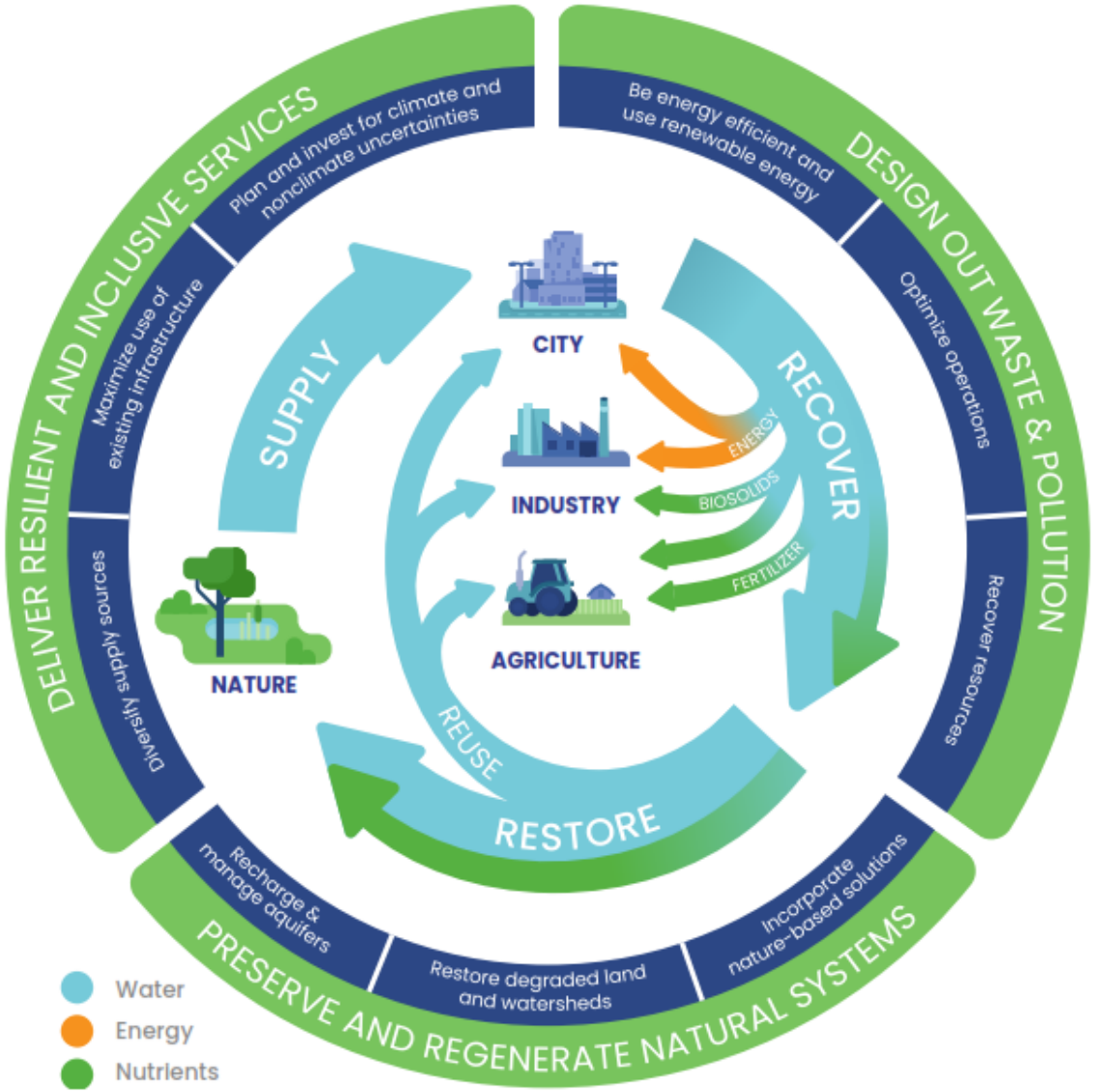
https://www.ifm.eng.cam.ac.uk/research/grant-writers-handbook/research-impact/

International Water Management Institute

CONTENT

1. Preamble
2. Three examples of our work
3. New CGIAR initiative

Circular Bio-Economy
Resource Recovery & Reuse (RRR)



Graphic: https://openknowledge.worldbank.org/handle/10986/36254


1
FORTIFER
COMPOST
Formulation Developed by :
IWMI
International Water Management Institute
MIXED ORGANIC FERTILIZER (MANURE)
3-in-1
1 Biosolids •
2 Organic Solid Waste
3 Ammonium Sulphate (Enriched)
Reg. No: PFRD/ PR/ 16/ 000-1
Net Weight
50kg
Improving Soil Fertility & Crop
PRODUCED AND MARKETED BY:

https://wle.cgiar.org/report-series

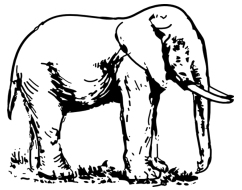
http://www.iwmi.cgiar.org/Publications/Books/PDF/resource-recovery-from-waste.pdf

Facilitating in Ghana Public-Private Partnerships

1. Co-composting plant (Accra/Tema)
2. Co-composting and briquette production plant (Somanya)
3. Wastewater –aquaculture plant (Kumasi)
4. Co-composting plant (Ho)

Challenges and Successes

1. A competing compost company claimed the land of our first plant two years after its inauguration as PPP, fenced it, and blocked the supply of septage and MSW. Currently the plant is operating at minimal capacity, and there is no solution in sight.
BTW: Land conflicts constitute about 60% of the total court cases in Ghana. Moreover, peri-urban municipalities and their boundaries are changing and so public plant ownership.

2. Despite market demand, it takes longer for compost plants to break even than anticipated. IWMI's idea was to step out after PPP set-up, but further investments were needed in production optimization (economies of scale), marketing strategies, and innovative sustainable finance and business thinking (e.g., branch or subsidiary).
All this undermined our *Exit Strategy and Impact pathway* while offering "Lessons learnt".


3. Wastewater –aquaculture PPP is diversifying (green houses, biogas, …) and thriving despite setbacks under Covid-19. https://www.youtube.com/watch?v=S2dU0OcyVoA


4. The briquette production PPP can rely on strong market demand and shows a clear ability to drive the business to profitability.

Refugee Settlements in East Africa (n=6)

https://rrr-refugee.iwmi.org/

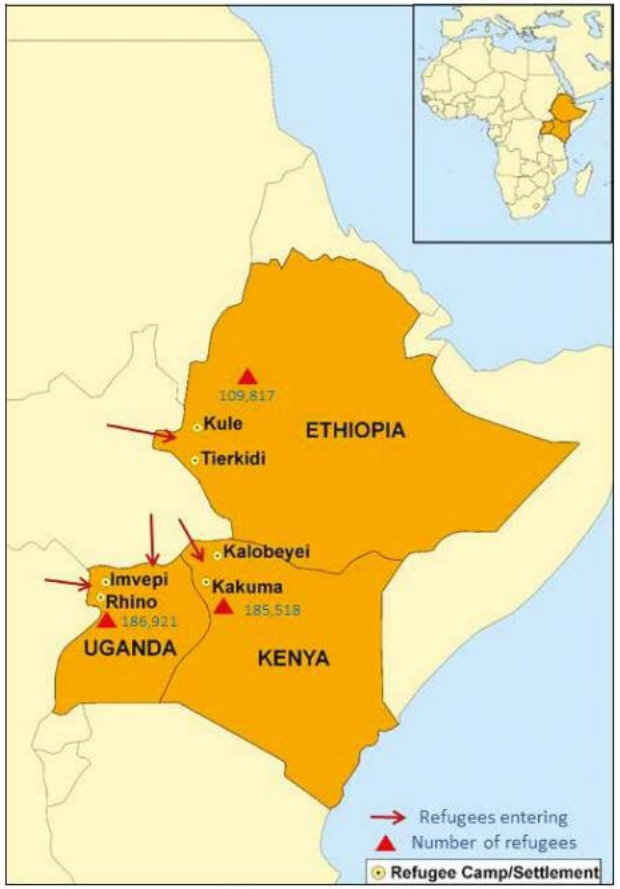


Figure 1. Project sites in Ethiopia, Kenya and Uganda.

Capacity building in RRR:

- Low-space home gardening, grey water use, waste composting
- Dry fuel production from organic waste

to improve nutrition and reduce conflicts around firewood between refugee camps and host communities, and related land degradation.

So far, more than 1,600 households from refugee and host community settlements trained with a strong focus on **gender** integration and transformation.

Refugee settlement in Kakuma, Kenya (*photo:* Tekeshi Kuno/UN-Habitat).

PennState ADRA DANISH REFUGEE COUNCIL IWMI International Water Management Institute World Agroforestry Alliance Bioversity International CIAT International Center for Tropical Agriculture Since 1967 Science to cultivate change

Refugee Settlements in East Africa (n=6)

https://rrr-refugee.iwmi.org/

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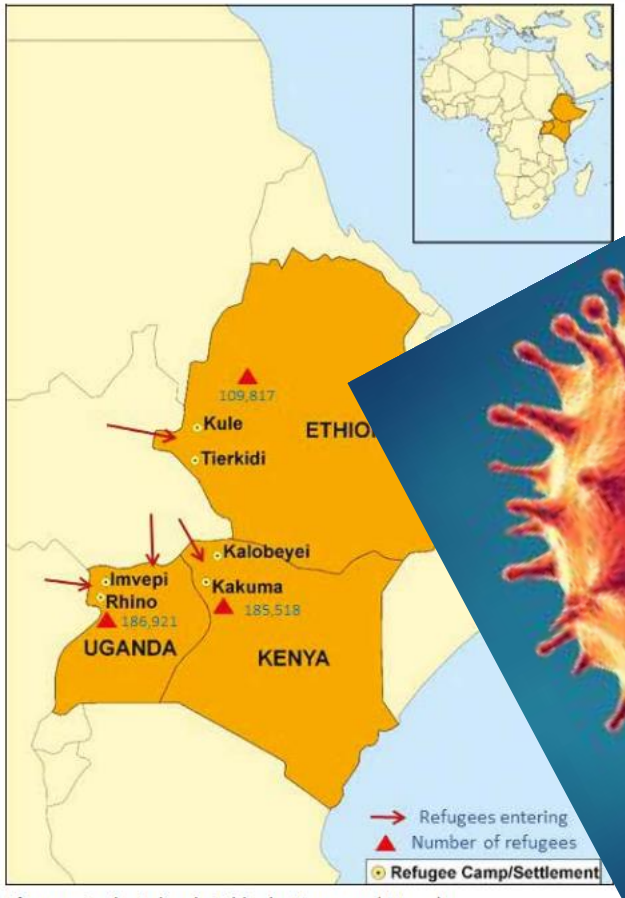

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…gee and host
…focus on

…ement in Kakuma, Kenya (*photo:* Tekeshi Kuno/UN-Habitat).

PennState

ADRA

DRC DANISH REFUGEE COUNCIL

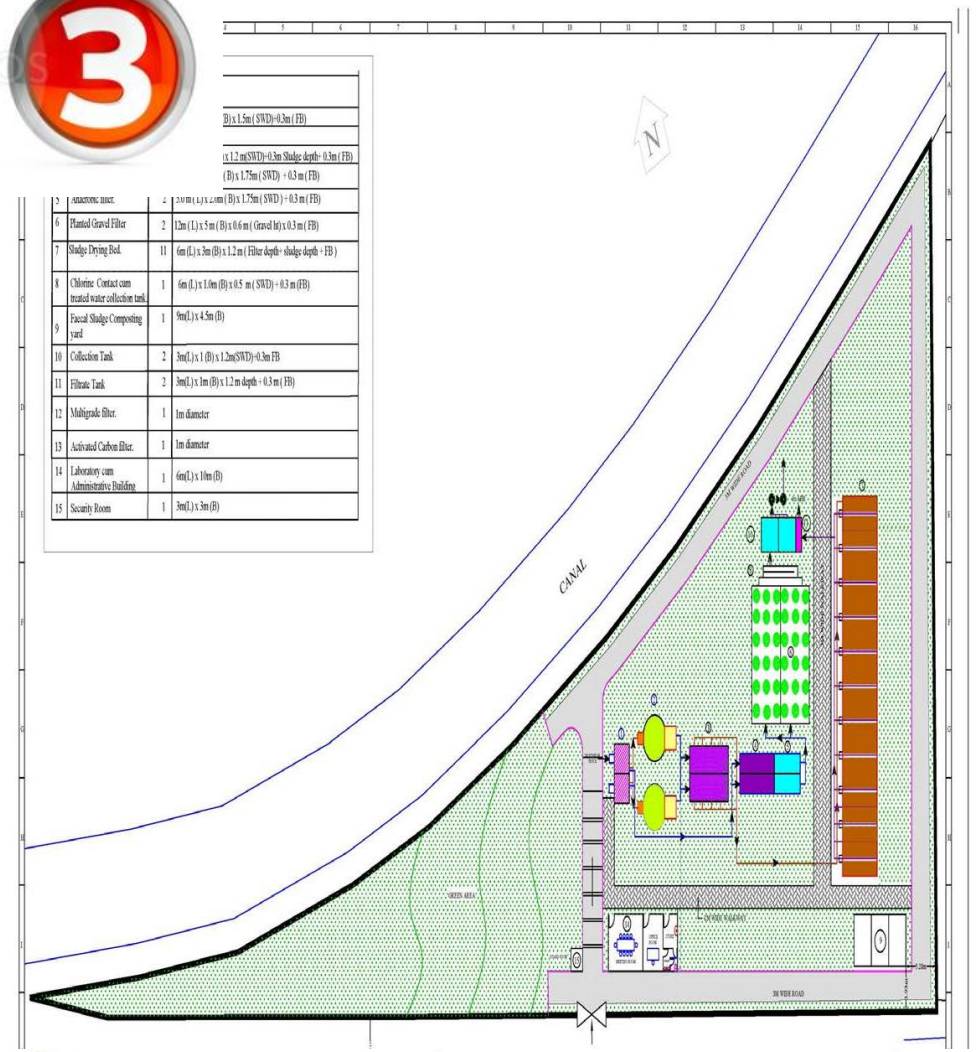
IWMI International Water Management Institute

World Agroforestry

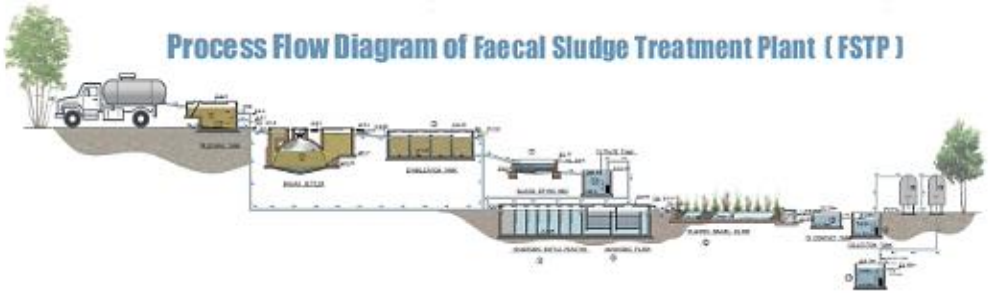
Alliance

Bioversity International

CIAT International Center for Tropical Agriculture Since 1967 Science to cultivate change



6	Planted Gravel Filter	2	12m (L) x 5 m (B) x 0.6 m (Gravel bd) x 0.3 m (FB)
7	Sludge Drying Bed.	11	6m (L) x 3m (B) x 1.2 m (Filter depth+ sludge depth + FB)
8	Chlorine Contact cum treated water collection tank.	1	6m (L) x 1.0m (B) x 0.5 m (SWD) + 0.3 m (FB)
9	Faecal Sludge Composting yard	1	9m(L) x 4.5m (B)
10	Collection Tank	2	3m(L) x 1 (B) x 1.2m(SWD)+0.3m FB
11	Filtrate Tank	2	3m(L) x 1m (B) x 1.2 m depth + 0.3 m (FB)
12	Multigrade filter.	1	1m diameter
13	Activated Carbon filter.	1	1m diameter
14	Laboratory cum Administrative Building	1	6m(L) x 10m (B)
15	Security Room	1	3m(L) x 3m (B)

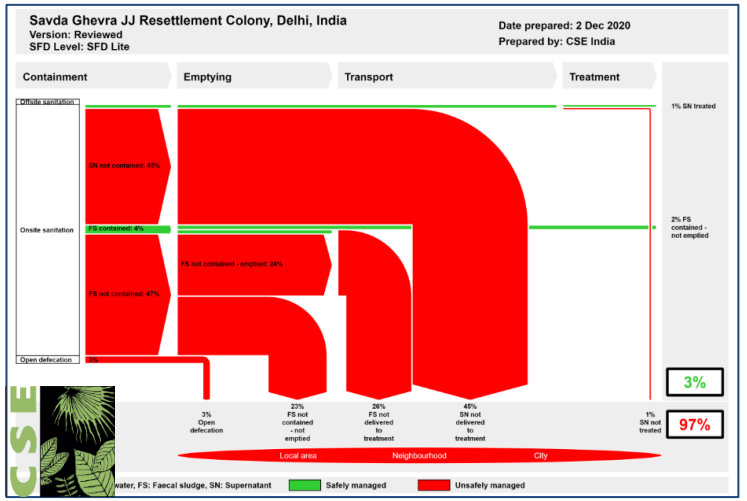


Slum resettlement in New Delhi

Objective: Implement a FSTP for a low-income resettlement community of 20,000 hhs (Savda Ghevra) in Delhi in close consultation with Government agencies and community stakeholders.

While the **Delhi Urban Shelter Improvement Board** had initially agreed to the land earmarked for the FSTP (with RRR components), it later returned to an earlier plan favoring a different land use.

Fecal Sludge Management remained unsustainable.



WaterAid

International Water Management Institute

CENTRE FOR URBAN AND REGIONAL EXCELLENCE

https://wle.cgiar.org/report-series

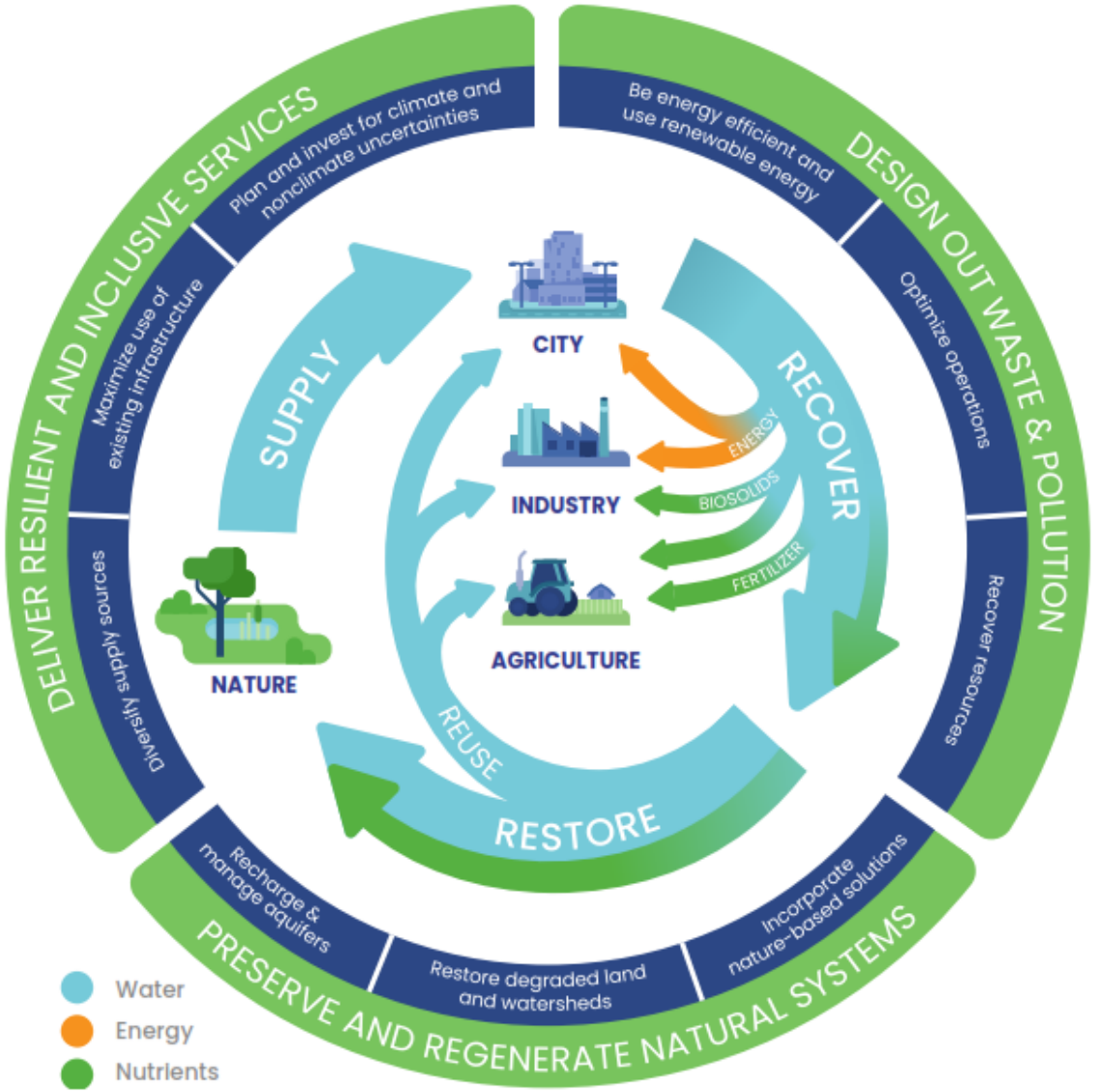
International Water Management Institute

CONTENT

1. Preamble
2. Three examples of our work
3. New CGIAR initiative

Circular Bio-Economy

Resource Recovery & Reuse (RRR)



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CGIAR Research Initiatives

Transforming Food, Land, and Water Systems in a Climate Crisis

https://www.cgiar.org/research/cgiar-portfolio/

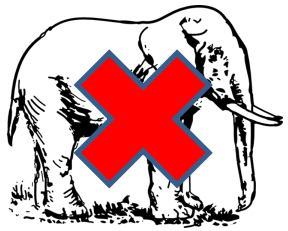
CGIAR | Resilient Cities Through Sustainable Urban and Peri-Urban Agrifood Systems

WP3: Strengthening circular bioeconomy through supporting private and public actors with technologies, business, and finance models; and strategies and guidelines for waste management and food safety in growing informal (irrigated) urban and peri-urban food systems.

Contact: **p.drechsel@cgiar.org**

*We welcome ideas & partners (research, capacity development, impact) working on **lessons learnt**, regional or global reviews, missing guidelines, etc., and are happy to host student interns or visiting scientists/practitioners, preferably in Ghana or Sri Lanka.*

Vacancies:
https://www.iwmi.cgiar.org/about/careers/iwmi-vacancies/



This Initiative will work in Bangladesh, Ethiopia, Ghana, Kenya, Peru and the Philippines, but also in & across other countries.
https://www.cgiar.org/initiative/16-resilient-cities-through-sustainable-urban-and-peri-urban-agrifood-systems/

International Water Management Institute

CGIAR Resilient Cities Through Sustainable Urban and Peri-Urban Agrifood Systems

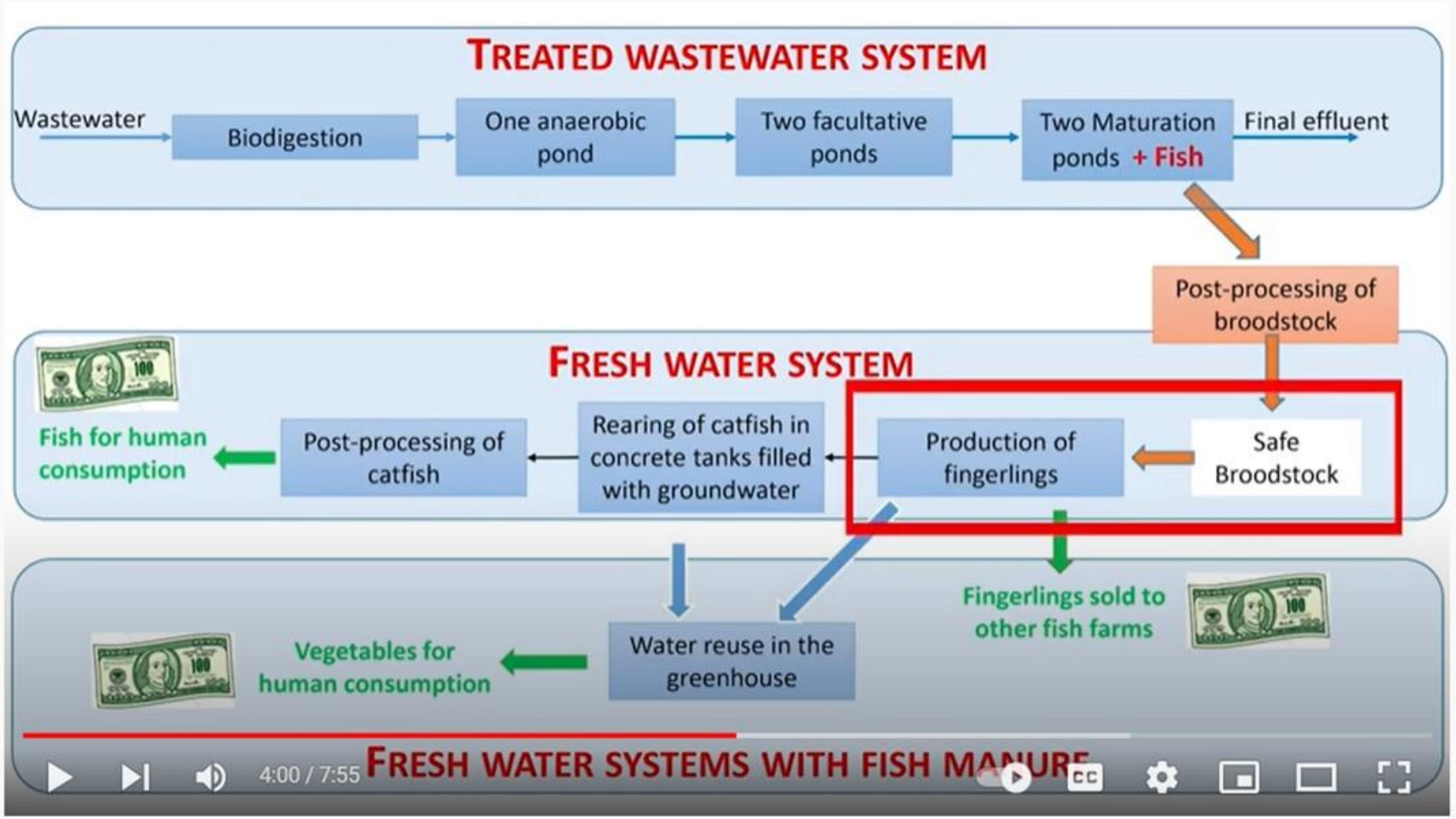
THANK YOU

sustainable sanitation alliance

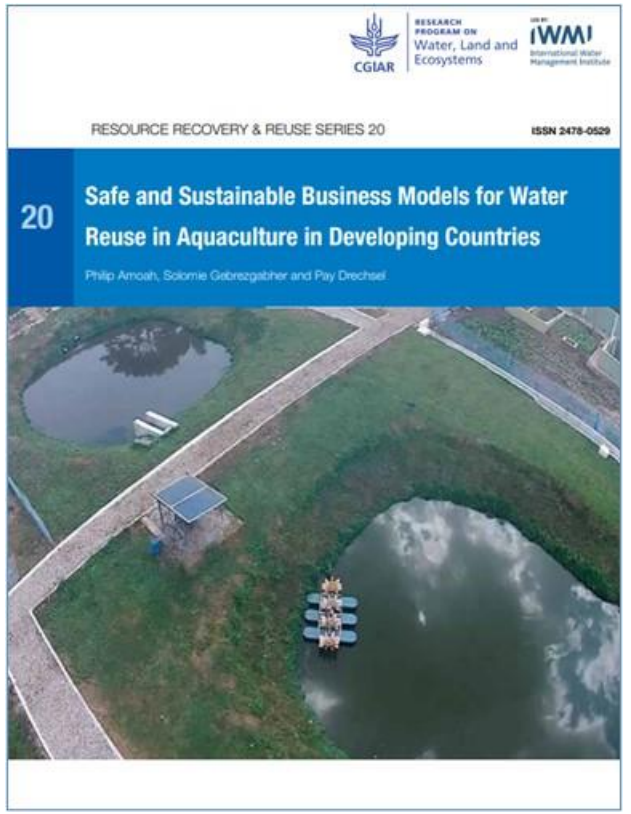
Pay Drechsel
p.drechsel@cigar.org

Innovative water solutions for sustainable development
Food · Climate · Growth

https://www.youtube.com/watch?v=S2dU0OcyVoA



Treated Wastewater Aquaculture: boosting revenue streams and production in Ghana | IWMI



http://www.iwmi.cgiar.org/Publications/wle/rrr/resource_recovery_and_reuse-series_20.pdf

sustainable sanitation alliance

WG 06: Cities (Part 1)

Dorothee Spuhler & Abishek Sankara Narayan (WG 06)

sustainable sanitation alliance

Integrating Basic Services in Ugandan Small Towns

Abishek S Narayan
Co-Lead WG-6
PostDoctoral Researcher
Eawag-Sandec
abishek.narayan@eawag.ch

sustainable sanitation alliance

The Why's?

- Why Integrate? → Siloed attempts have negative effects and missed synergies
- Why Small Towns? → 6500 small towns in Africa, and are the fastest growing urban section in the world.

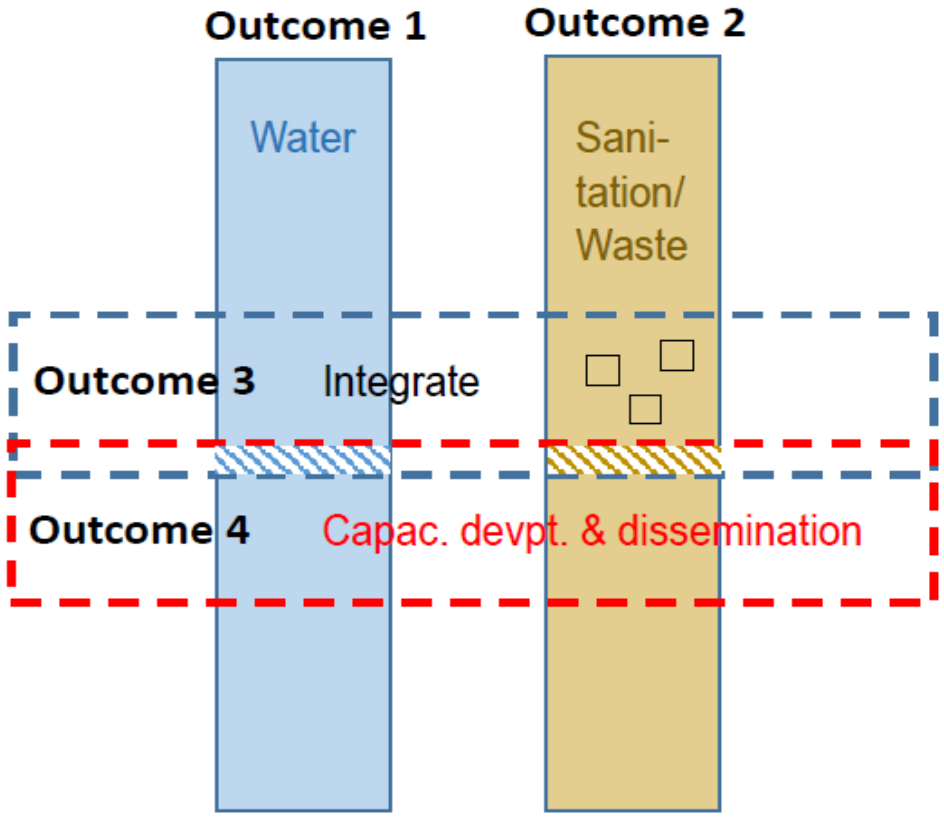
New Project at Eawag – WABES 2.0

Outcome 1: Improved and equitable access to safely managed water

Outcome 2: Improved and equitable access to safely managed environmental sanitation, considering circular economy principles

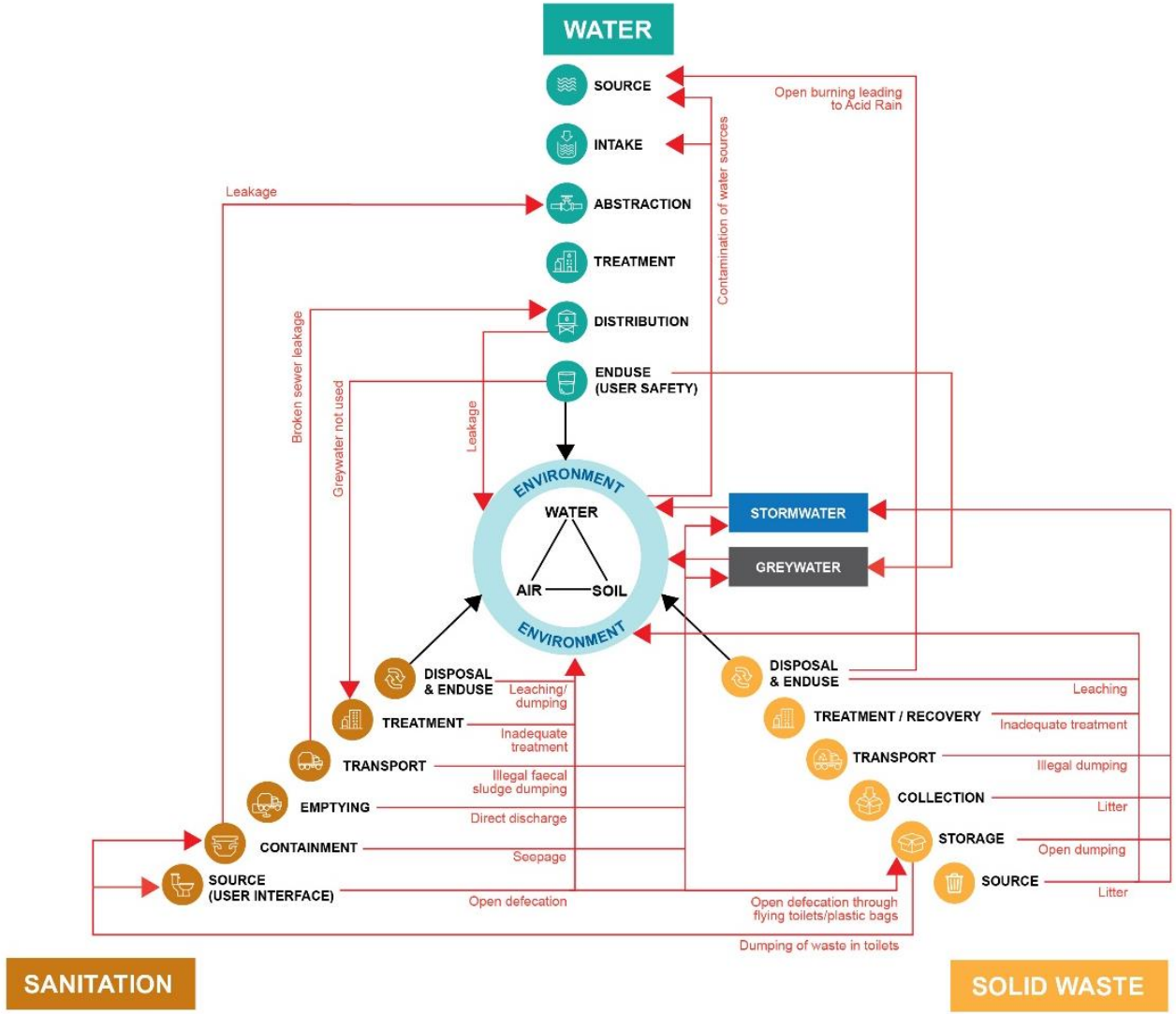
Outcome 3: Integrated, inclusive planning for safely managed water and waste services is available and applied in small towns of sub-Saharan Africa

Outcome 4: Knowledge and expertise/training content is used and applied in practice by students and development practitioners



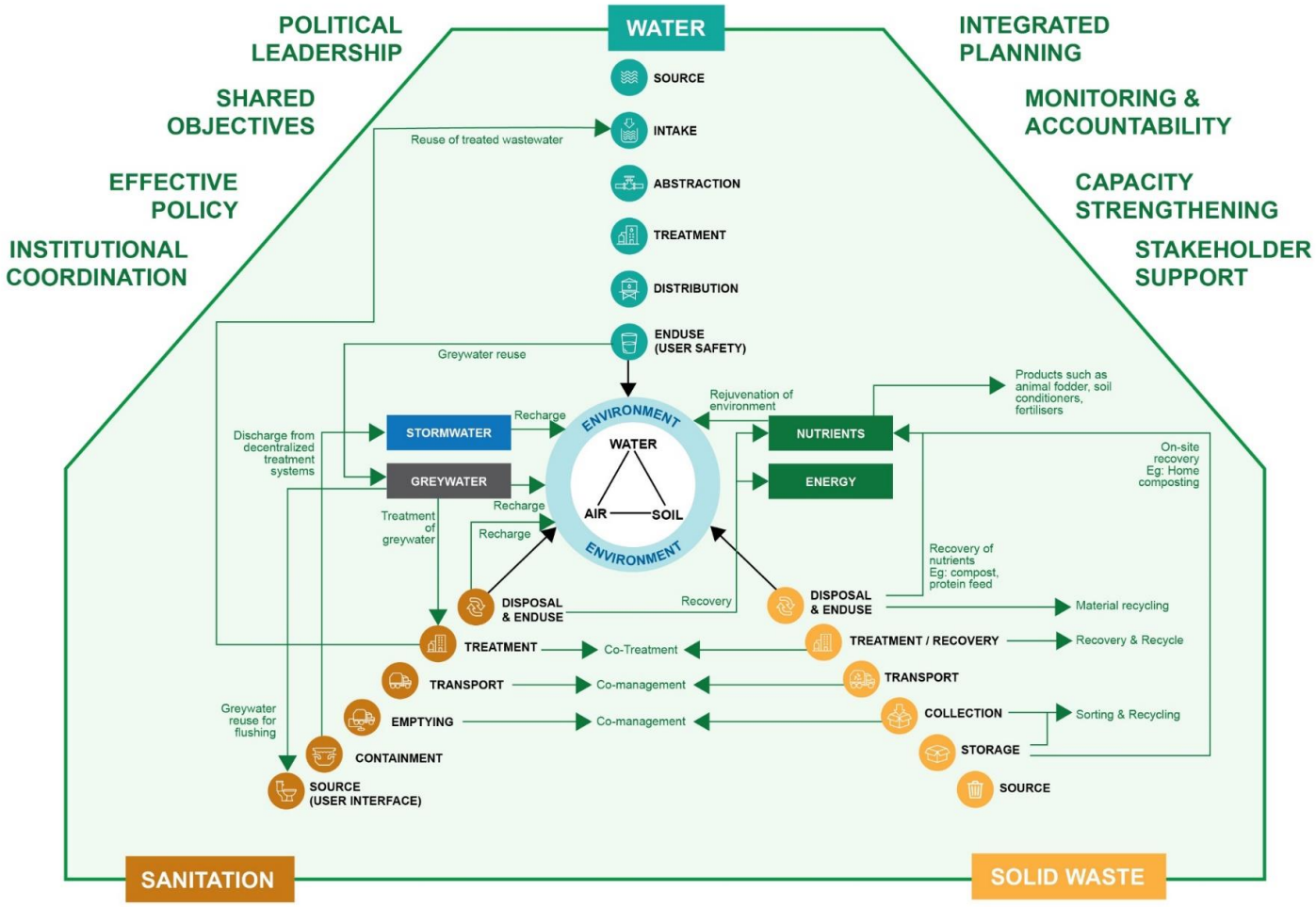
Problem with Siloed Basic Services

- Water, Sanitation and Solid Waste are inherently linked.
- Often because of poor management, there are negative interactions between these sectors.
- E.g: Solid waste clogging sewers or untreated wastewater contaminating water sources.



Opportunity for Integration

- Can tap into synergies and co-benefits.
- E.g: Reuse of treated water for flushing. Co-digestion of organic and faecal waste
- Needs strong leadership and an enabling environment.



The Research

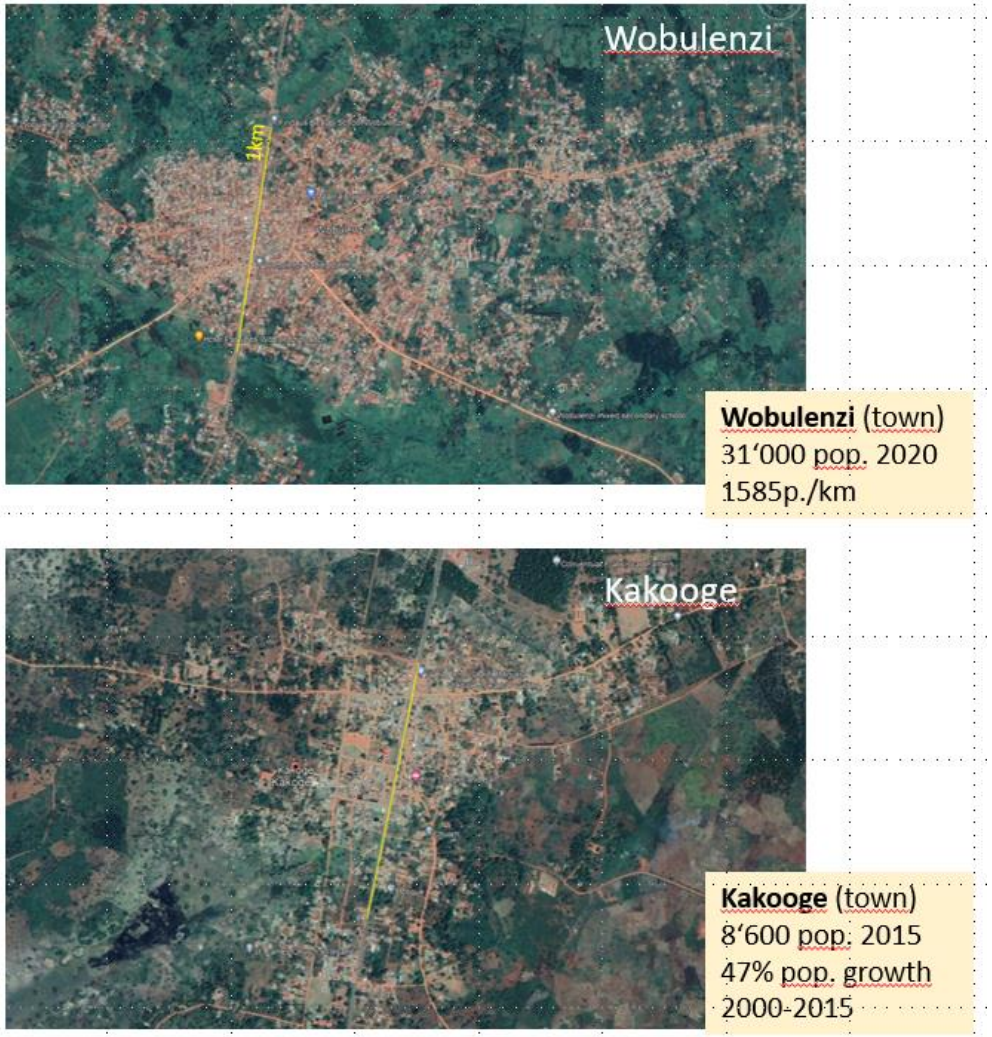
Hypothesis

Planning water, sanitation and solid waste in an integrated manner will lead to better planning and service outcomes.

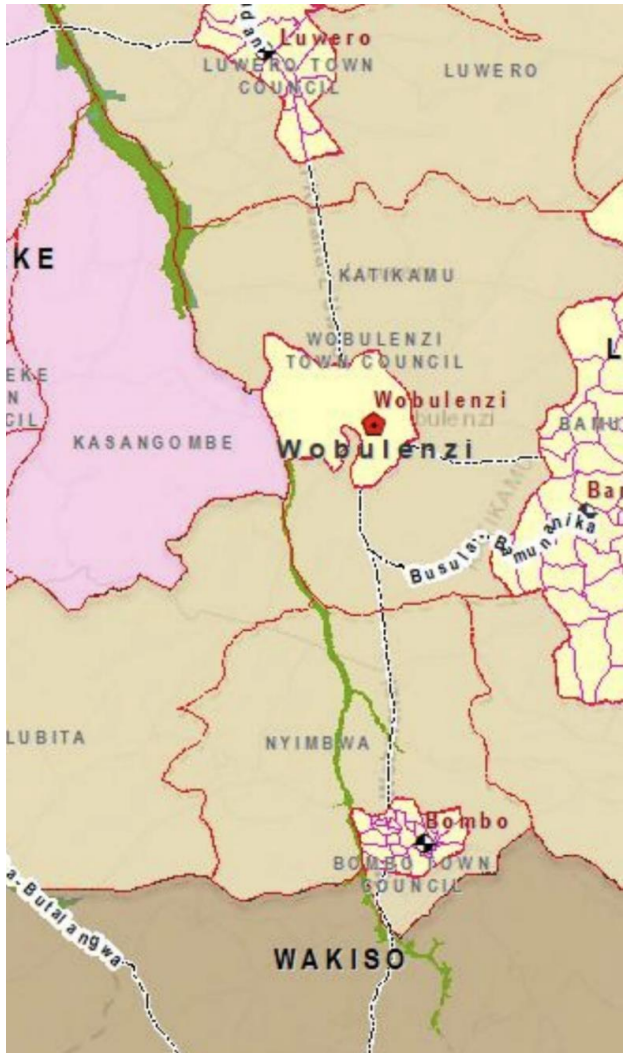
Research Questions

Q1: How to plan water, sanitation and solid waste in an integrated manner?

Q2: What are the overall service outcome and process benefits of integrated planning?



Small Towns in Uganda & Parish Model



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Water Supply

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Sanitation

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Solid Waste Management

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White Elephants in Sanitation

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"Over-integration may not be good as well since problem size becomes too hard to handle"

–MoWE

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"We want researchers to come here. Because we know after research, investments from somewhere always comes for us. It is with these research outputs that we can also get funding"

–Town Clerk

sustainable sanitation alliance

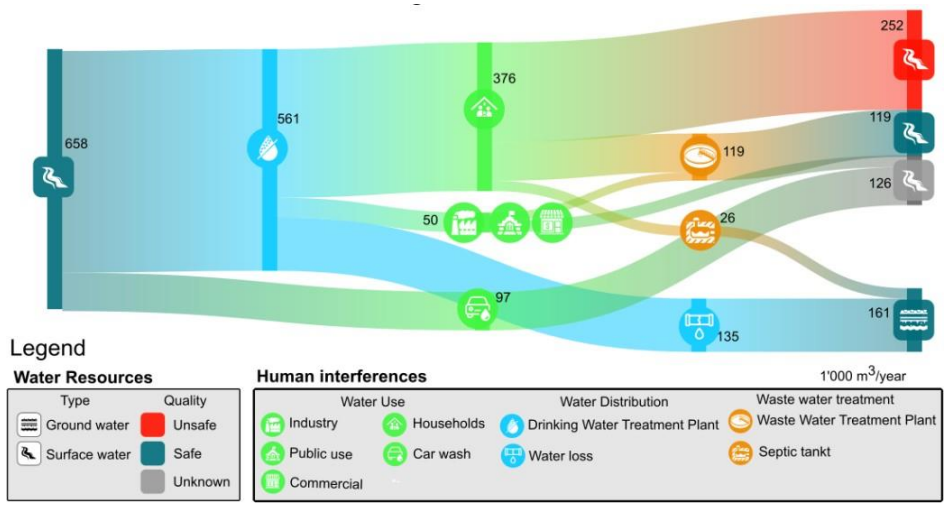
Previous Integration Attempts

- In order to not re-invent the wheel, we are collecting past attempts on integration and the learnigns from them.
- Please share your knowledge on this.
- Will start a SuSanA forum post on this.

Eawag:
Swiss Federal Institute of Aquatic
Science and Technology

Urban Water Flow Diagrams (uWFD):

Visual Stories for Better Water Resource Management

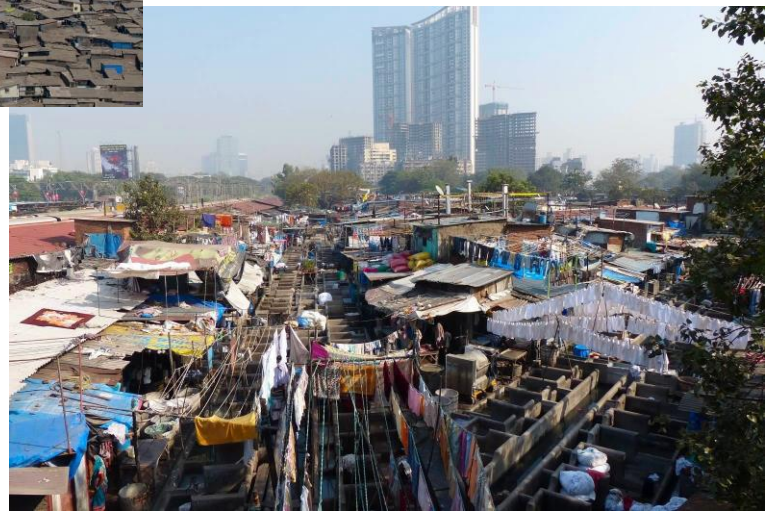


Dorothee Spuhler - dorothee.spuhler@eawag.ch
Marc-André Bünzli (SDC) - marc-andre.buenzli@eda.admin.ch

Motivation and Vision

Urbanisation and industrialization put increasing pressure on the urban water cycle:

- Pollution of ground and surface water resources
- Overexploitation
- Impermeable surfaces
- Climate change
- Inequal allocation or distribution
- Conflicts of interest
- Etc.

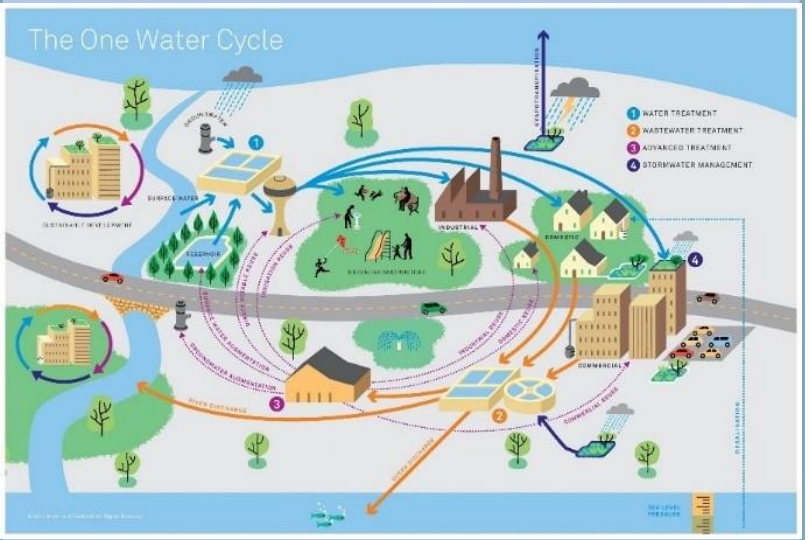


Sustainable urban water management requires an integrated and inclusive approach including **different sectors** (health, environment, infrastructure, energy, etc.) and **stakeholders from all these sectors** (authorities, companies, civil society).

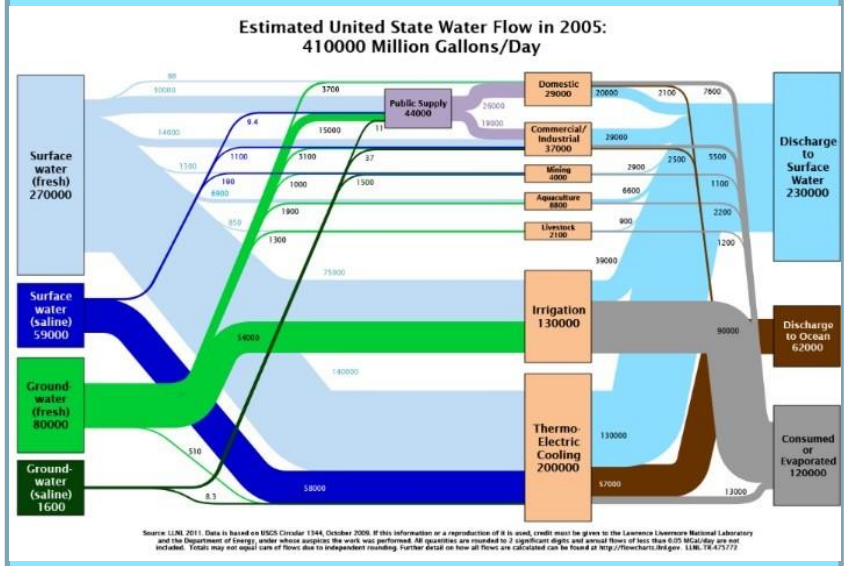
But where to start?

There is a need for a simple tool that allows to start this process.

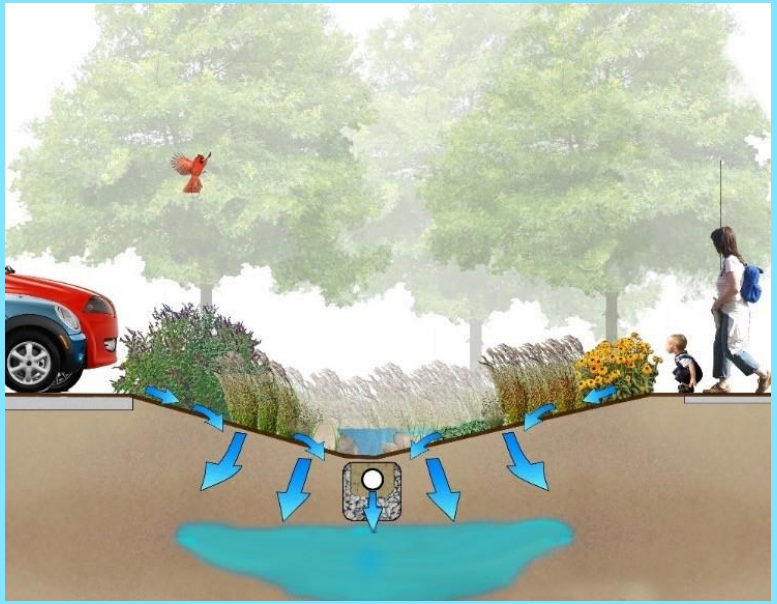
From understanding to action



1. Develop an appropriate **conceptual model** for water flows

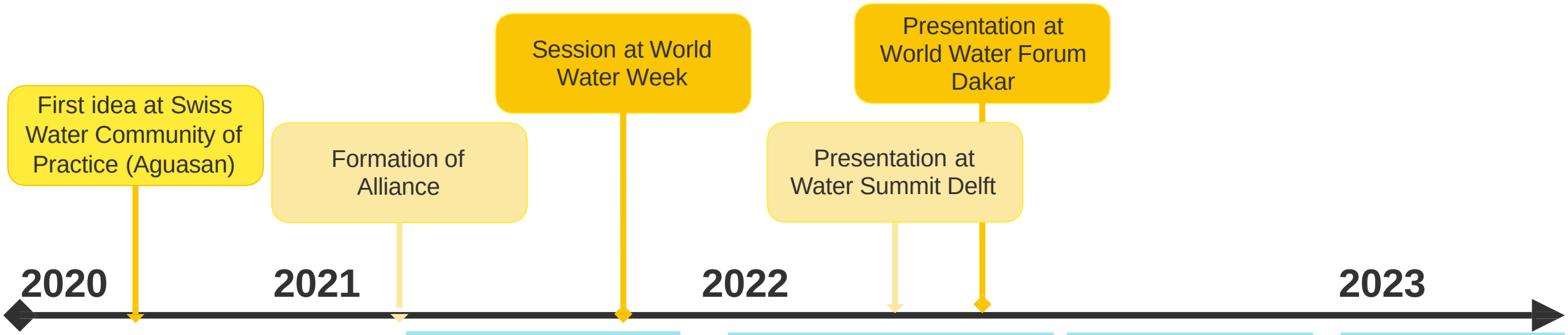


2. Use the **water flow diagram** to identify challenges in water use



3. Find **solutions** to solve the challenges and rehabilitate ecosystems

What happened so far?



UNICEF
Stockholm Environmental Institute
Swiss Agency for Development and Cooperation (SDC)
Swiss Water Partnership (SWP)
Swiss Church Aid (HEKS/EPER)
Eawag: Swiss Federal Institute for Environmental Science and Technology

Lead: Eawag
Core Partners: SDC, Heks, Helvetas

Expert Panel

Objectives, or «Theory of Change»

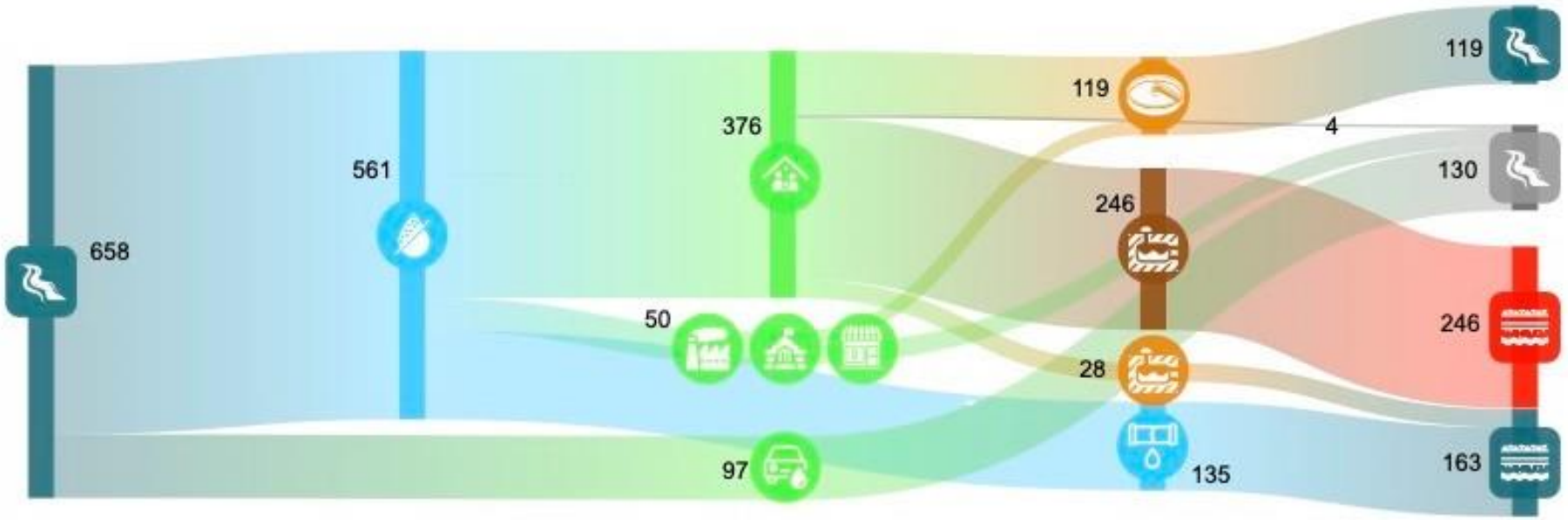
1. **Visualize** urban water flows, quantities, qualities, balances, and problematic issues including challenges and opportunities
2. **Enable dialogue** among different water users (industries, communities) and governing bodies
3. **Increase political priority** for urban water management and foster collaboration between IWRM, WASH, HRWS and circular economy
4. **Trigger** more holistic and thus sustainable and and just water management decisions

1st Prototype presented at the World Water Week 21

Case 1: Rio Pardo den Minas, Brasil

- Led by two HEKS/EPER partner organizations
- Together with an existing mulit-actor network acting to increase management and social control over the use of water along the Pardo River Basin
- Between May and August/2021 with external engineering consultant (Carolina Natel de Moura)
- Close dialogue with the municipal government of Rio Pardo de Minas
- Data collection; Pre-processing of data; Data Insertion into Diagram
- Validation (local community, municipality, social movements)

Water Flow Diagram of Rio Pardo de Minas



Legend

Water Resources

Type	Quality
Ground water	Unsafe
Surface water	Safe
	Unknown

Human interferences

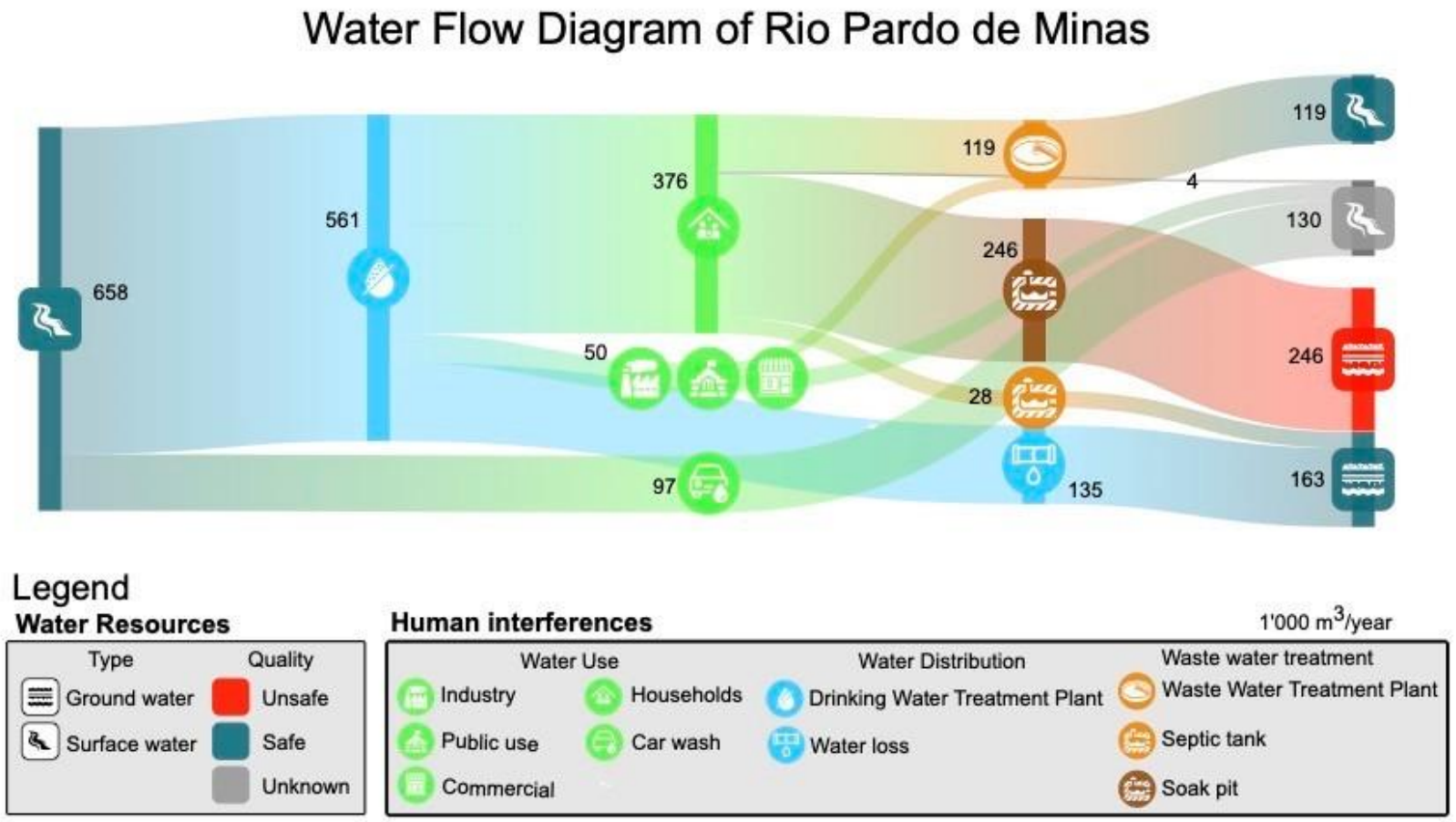
1'000 m^3/year

Water Use		Water Distribution	Waste water treatment
Industry	Households	Drinking Water Treatment Plant	Waste Water Treatment Plant
Public use	Car wash	Water loss	Septic tank
Commercial			Soak pit

uWFD Rio Pardo, Bresil

Results

"The main water-related problems identified correspond to the **low rate of sewage collection and treatment**, **large losses of water** in the treated water distribution system, a high use of water for car-washing and **lack of data related to surface water quality.**"



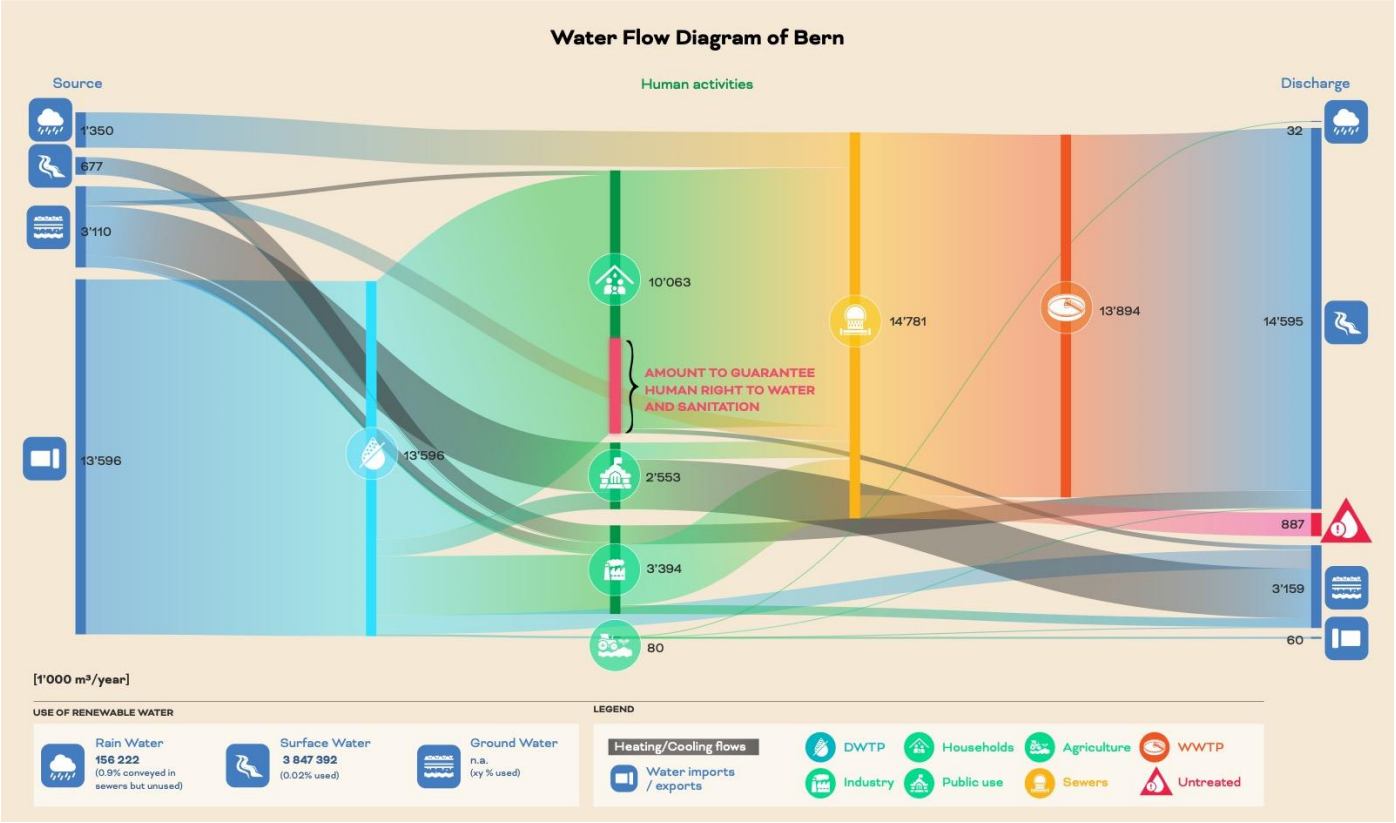
uWFD Rio Pardo, Bresil

Feedback from the stakeholders

- Easy-to-apply
- Objective and intuitive
- Points out what needs to be improved, e.g. over use, pollution
- A good tool for communication between different actors (specialists, communities, activists)
- A credible instrument for public/political advocacy (even between municipalities, states and countries)
- Locals and social movements can complement the final result with their data/impressions (“citizen science” perspective)
- Great potential for conflict negotiation and peacebuilding among public authorities, water users (including industry and mining), and civil society
- The case study led to the intention of reproducing this type of analysis throughout the Pardo river basin in order municipalities

uWFD Bern, Switzerlan

- Most water is being imported
- High combined sewer overflow
- Potential to better manage precipitation water during heavy rainfall events
- The city of Bern is currently piloting different approaches:
  - Decentralised infiltration
  - Nature-based solutions
- Expected benefits:
  - Increased retention
  - Urban greening
  - Micro-climate, biodiversity, recreation



uWFD Bangalore

Water Balance of Bangalore in 2015-2016

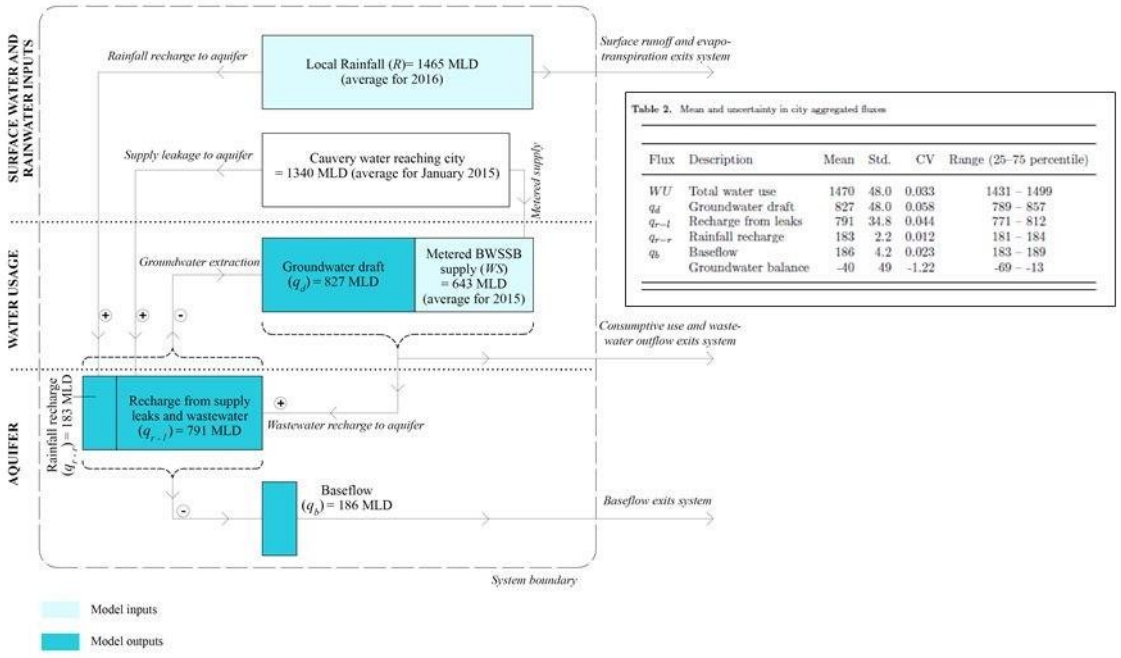


Table 2. Mean and uncertainty in city aggregated fluxes

Flux	Description	Mean	Std.	CV	Range (25–75 percentile)
WU	Total water use	1470	48.0	0.033	1431 – 1499
q_d	Groundwater draft	827	48.0	0.058	789 – 857
q_{r-l}	Recharge from leaks	791	34.8	0.044	771 – 812
q_{r-r}	Rainfall recharge	183	2.2	0.012	181 – 184
q_b	Baseflow	186	4.2	0.023	183 – 189
	Groundwater balance	-40	49	-1.22	-69 – -13

Urban Water Journal **2020** doi:10.1080/1573062X.2020.1836237

Disaggregated water balances for Bengaluru in 2015-2016

Table 3. Grid-wise mean water budget in MLD.

Grid ID	Grid Name	WU	q_{r-r}	q_{r-l}	q_r	q_b	q_d	q_{net}
1	Ganganahalli	9.9	6.0	4.3	10.3	2.5	9.2	-1.4
2	Vidyaranyapura	24.5	8.7	11.5	20.1	9.1	16.2	-5.2
3	Yelahanka New Town	28.9	4.1	17.0	21.1	4.0	15.2	1.9
4	Agrahara	15.3	7.7	7.1	14.8	2.0	12.8	-0.0
5	Peenya	42.1	7.6	25.2	32.8	3.5	33.9	-4.5
6	Jalahalli	61.8	6.6	35.3	41.9	6.5	35.4	0.1
7	Hebbal	65.8	7.6	34.9	42.5	0.6	44.4	-2.5
8	Hennur	48.7	7.6	28.4	36.0	0.0	40.6	-4.6
9	Channasandra	17.1	7.2	8.6	15.7	4.1	17.0	-5.4
10	Herohalli	71.9	7.6	45.2	52.9	0.9	53.5	-1.6
11	Rajajinagar	127.9	4.0	58.3	62.4	6.6	57.9	-2.1
12	Bangalore Palace	84.1	4.0	39.9	43.9	9.8	27.5	6.6
13	Cooke Town	74.4	3.5	35.8	39.3	5.8	29.2	4.4
14	Krishnarajapuram	56.6	4.9	33.2	38.1	9.4	30.0	-1.3
15	Kodigehalli	25.0	6.1	12.9	19.0	5.2	17.8	-4.0
16	Bangalore University	43.3	6.1	29.0	35.1	17.2	18.9	-1.0
17	Chamarajpet	136.4	6.1	82.9	89.0	18.7	73.7	-3.4
18	Shantinagar	79.3	6.0	40.0	46.0	13.6	25.9	6.6
19	Domlur	51.4	4.5	24.7	29.2	5.7	20.6	2.9
20	HAL Airport	37.0	6.0	16.5	22.5	6.1	19.1	-2.7
21	Whitefield	20.6	6.1	10.2	16.3	4.4	15.8	-3.9
22	Kengeri	22.8	5.0	10.3	15.4	8.0	16.1	-8.6
23	Chikkasandra	71.9	6.5	36.8	43.4	11.2	38.8	-6.6
24	JP Nagar	89.9	6.6	54.2	60.9	11.0	43.9	6.0
25	HSR Layout	75.3	7.6	40.4	48.1	0.0	49.8	-1.7
26	Doddakannelli	21.0	7.6	10.4	17.9	8.7	16.1	-6.8
27	Kothnur	39.2	10.6	21.1	31.8	6.0	25.5	0.2
28	Begur	27.6	10.5	16.3	26.9	5.3	22.4	-0.8
	Totals	1470	183	791	973	186	827	-40

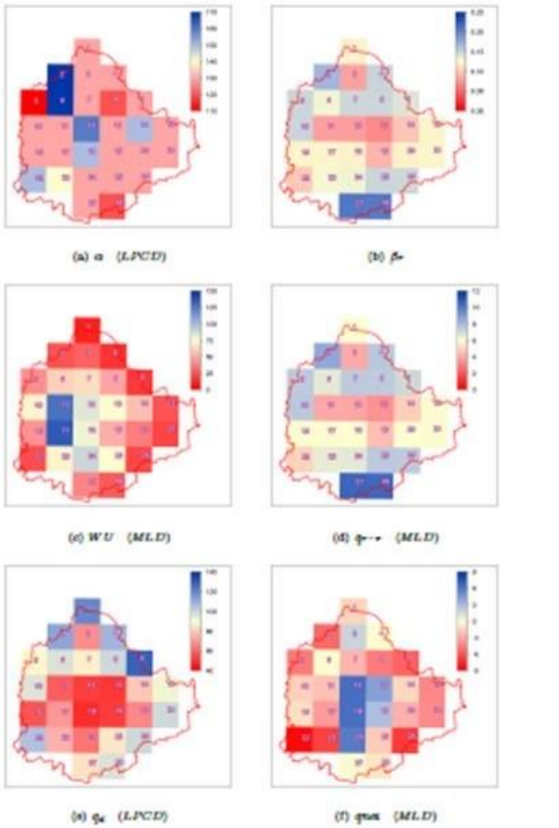


Figure 3. Spatial distribution of ensemble means for (a) per capita water use, (b) rainfall recharge coefficient, (c) total water use, (d) recharge from rainfall (q_{r-r}), (e) groundwater draft (q_d) and (f) net groundwater balance.

Results from Stockholm WWW 2021

- How to overcome the Data Gap?
- Need for standardisation

Standardized Methodology

Objective

- Enable practitioners to use the tool
- Ensure comparability of different water flow diagrams over time or from different cases
- Clarity about what it shows and what it doesn‘t show
- Alignment with existing definitions from WASH, IWRM, HRWS and the SDGs

The uWFD and the SDGs

6.1.1 Proportion of population using safely managed drinking water services

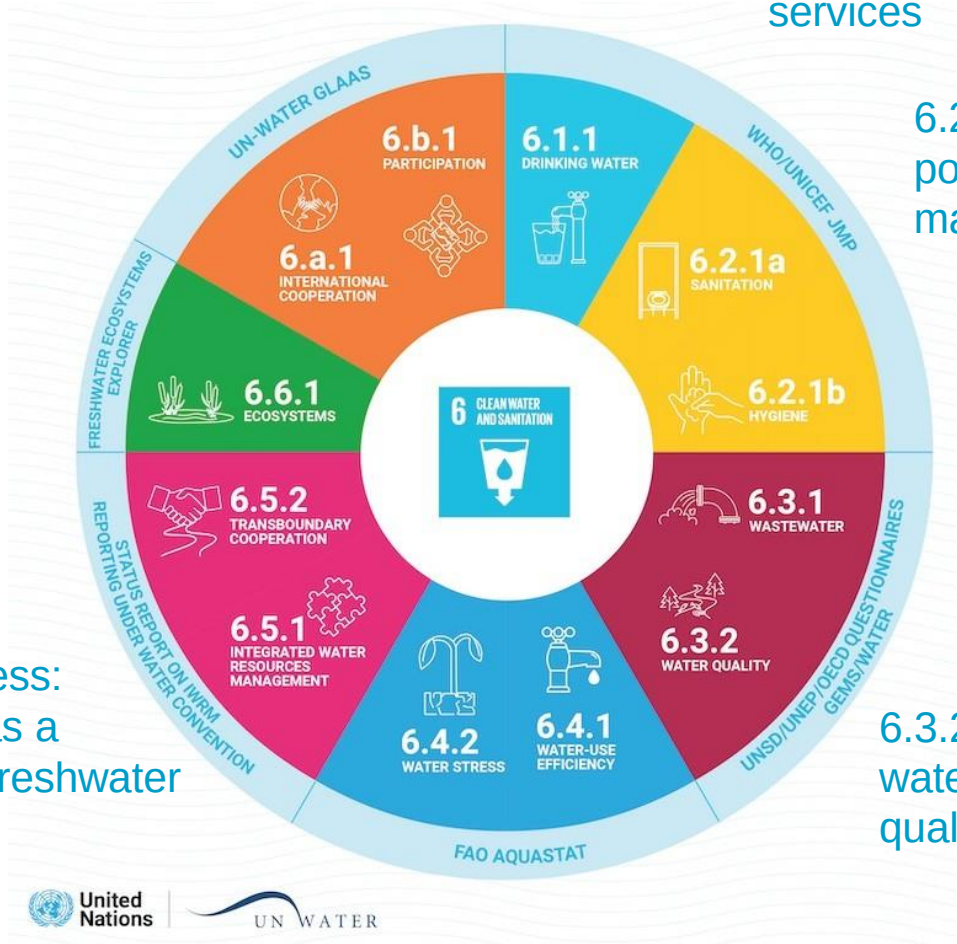
6.2.1a Proportion of population using safely managed sanitation services

6.3.1 Proportion of domestic and industrial wastewater flows safely treated

6.3.2 Proportion of bodies of water with good ambient water quality

6.4.1 Change in water-use efficiency over time

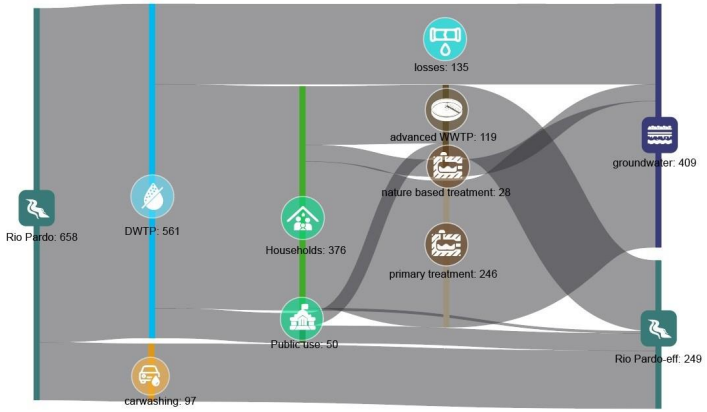
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources



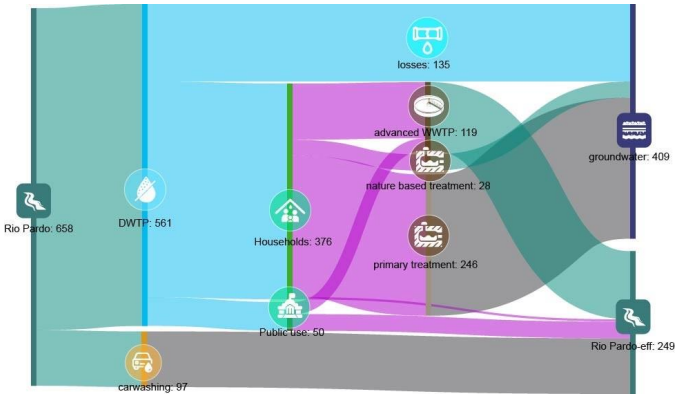
The Water Flow Diagram

6 Main Components

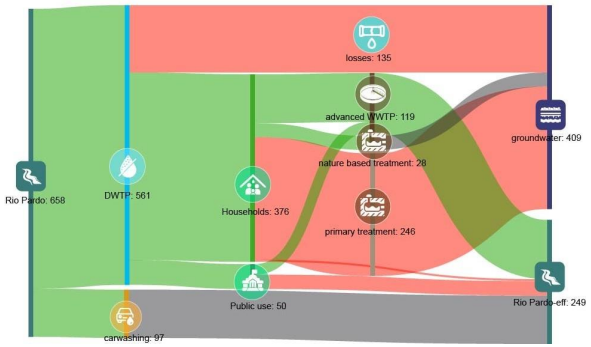
System Map and Nodes Library



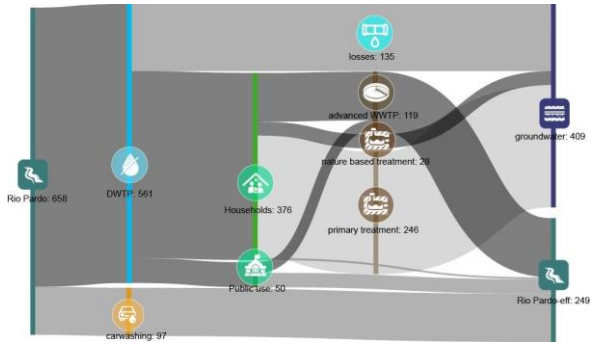
Water Quantities



Water Qualities



Quality Judgements



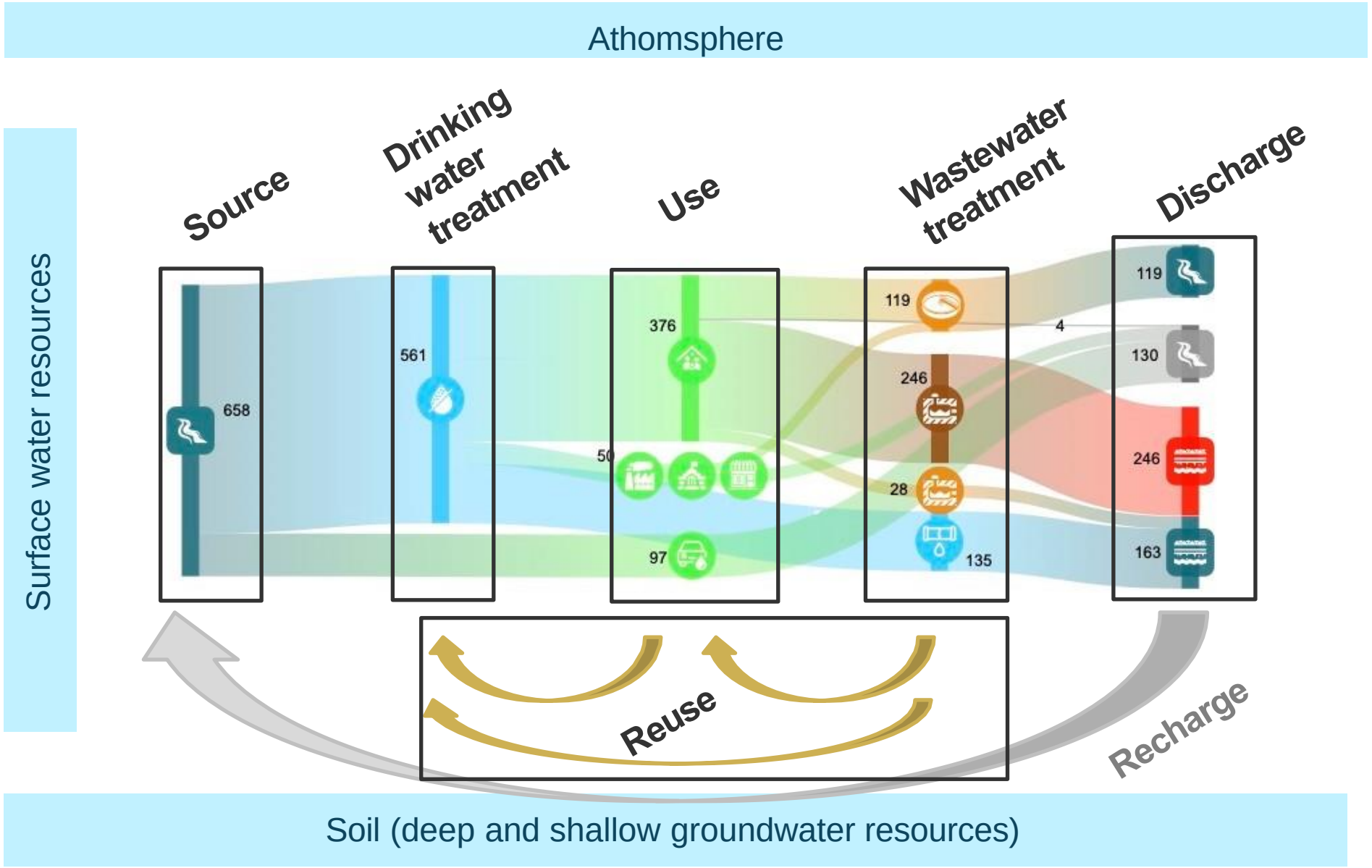
Judgment of accuracy

?

Vulnerability / Sensitivity to Climate Hazards

System Map

- System boundaries
- 6 Functional groups
- Nodes
- Flows



Nodes Library

Source / Abstraction

Precipitation

Surface water (lakes and rivers)

Groundwater

Drinking water treatment

Turbidity treatment

Microbial treatment

Advanced treatment

Use

Private use
Public use
- Institutions
- Other
Urban Greening
Agricultural Use
- Irrigation
-Animal breeding
Industrial use
- Process water
-Heating/cooling
Informal water use:
- Non-revenue water
- Losses (pipe loss, etc.)

Wastewater Treatment

Onsite storage
Offsite storage and treatment
Primary Treatment
Secondary Treatment
Tertiary Treatment
Advanced Treatment
Blue-Green Infrastructure & Forest

Discharge

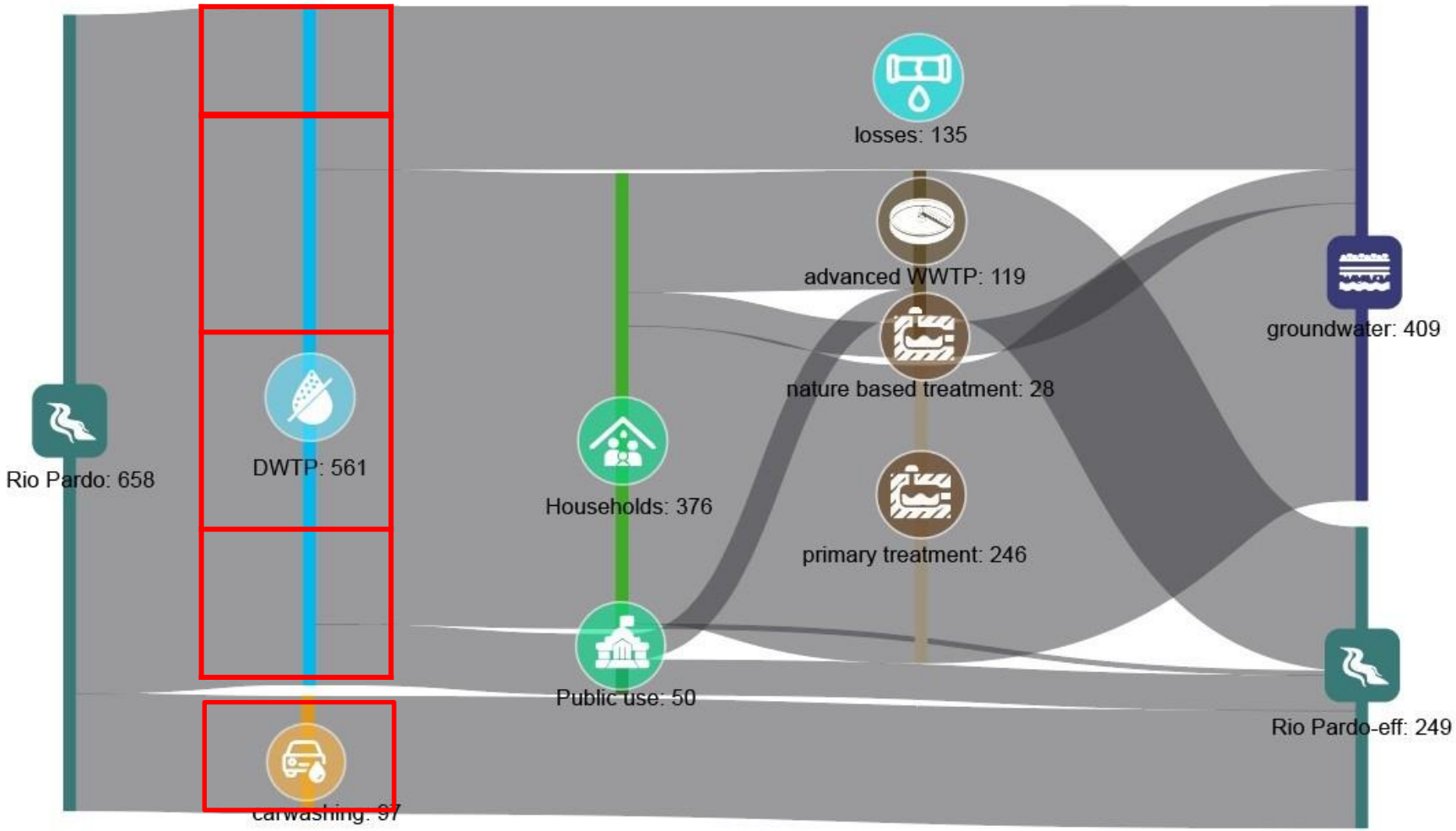
Surface water disposal / recharge
Groundwater disposal/ recharge
Advanced groundwater recharge
Evapotranspiration/ Evaporation

Reuse

Private (non-potable) reuse
Public (non-potable) reuse
Industrial (non-potable) reuse
Agricultural (non-potable) reuse
Potable reuse

Water Quantities

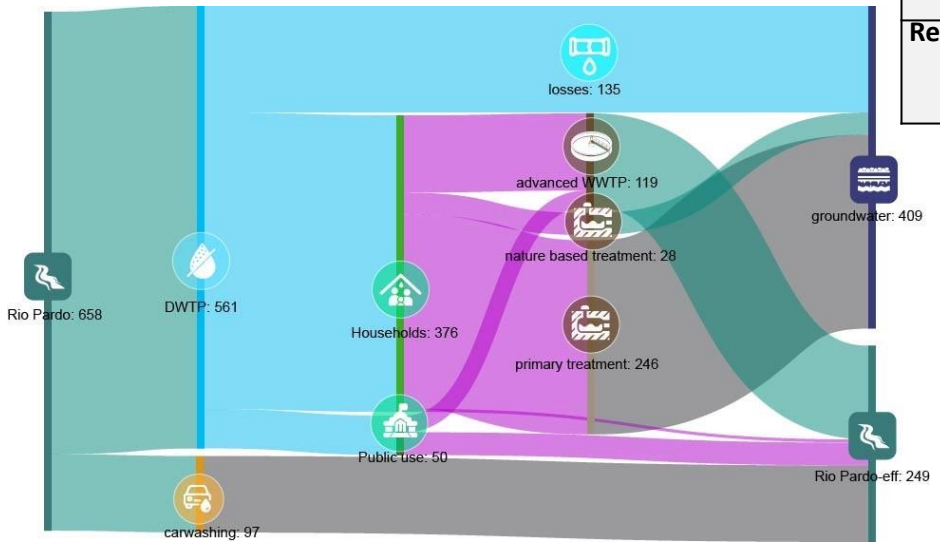
Sankey Diagram



Water Qualities

4 Categories

- **0**: Uncontaminated (safe)
- **b**: Biologically contaminated
- **c**: Chemically (and maybe biologically) contaminated
- **u**: Unknown



Flow categories		Description	Sub-categories name			
			Uncontaminated	(micro-) biologically contaminted	chemically contaminated (maybe also microbial contamination)	Unknown
			0	b	c	u
Source water	S	Water from precipitation, surface water or groundwater/springs	S0	Sb	Sc (incl. brakish water)	Su
Drinking Water	DW	water from drinking Water treatment plant	DW0	DWb	DWc	DWu
Wastewater	W	Any used water	W0	Wb (e.g. greywater)	Wc (e.g. municipal wastewater)	Wu
Effluent	E	Any effluent from wastewater treatment	E0	Eb	Ec	Eu
Recycled water	R	Any water that is recylced again in the urban water cycle	R0	Rb	Rc	Ru

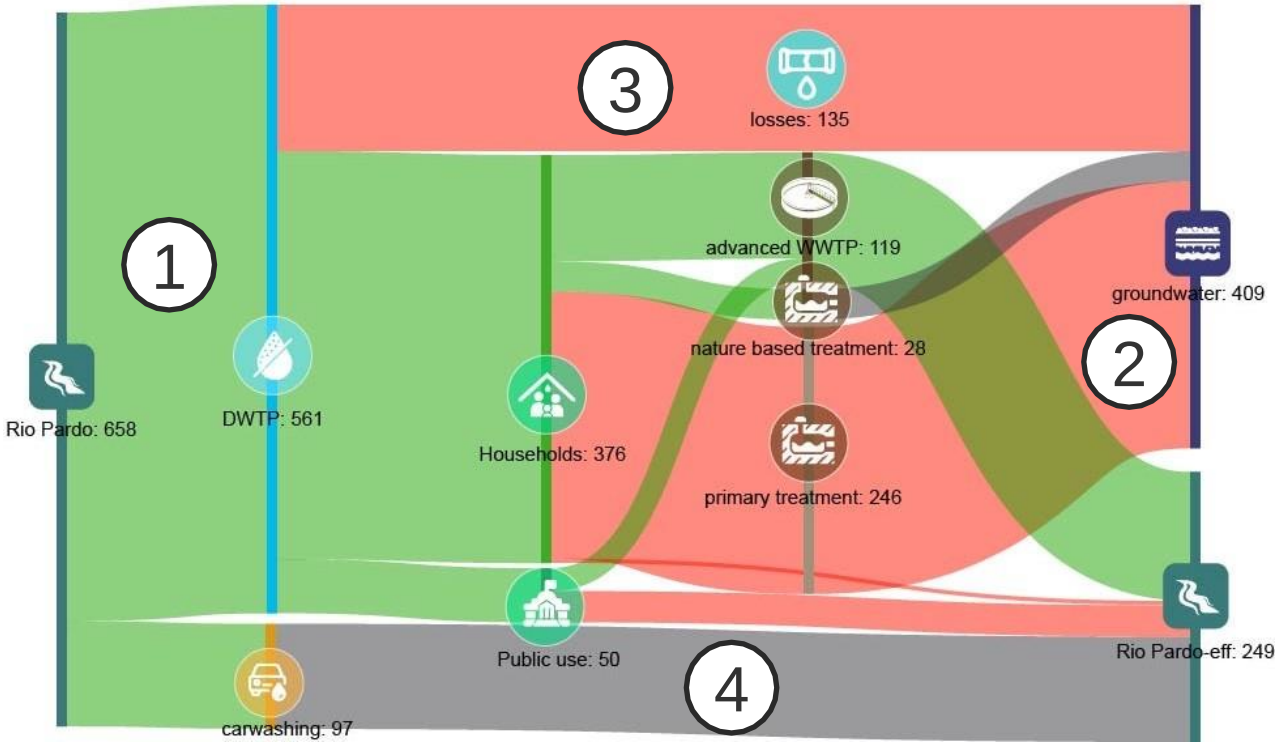
Quality Judgement

A judgement based on the water quality (inflow) and ist use (node)

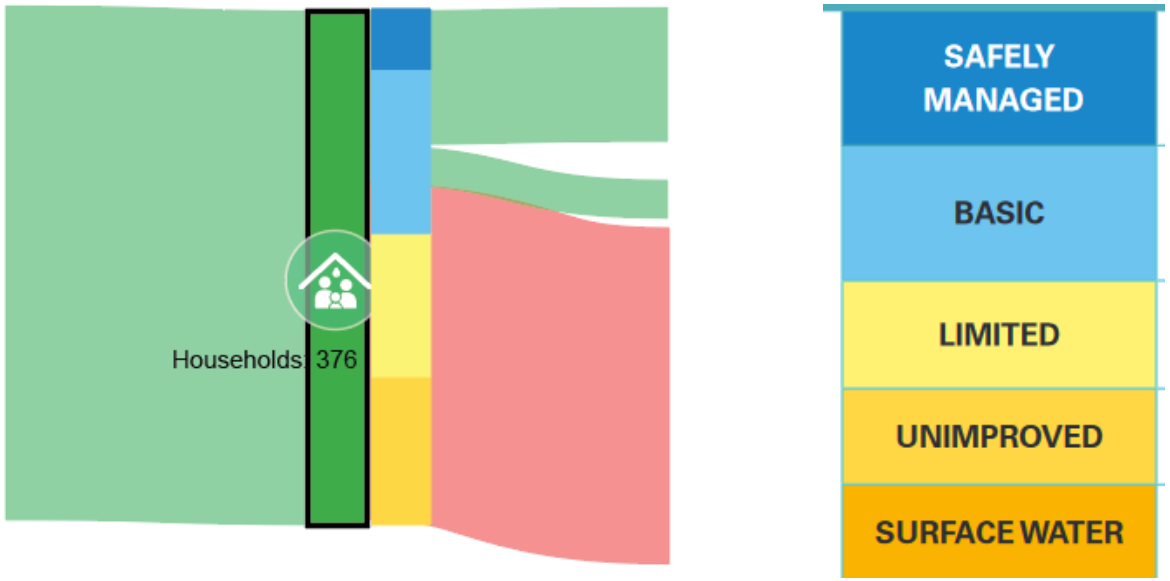
Is the water quality of a specific flow appropriate or problematic?

Examples:

1. appropriate: consumption of treated water
2. problematic: discharge of untreated wastewater to river
3. problematic: water losses in pipe
4. Grey = unknown (4)



Link to SDGs

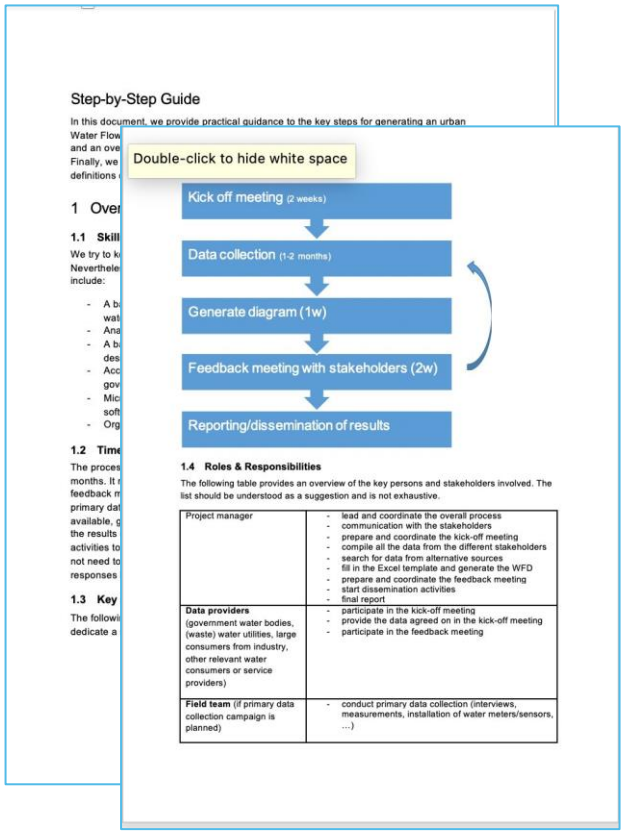


6.1.1 Proportion of population using safely managed drinking water services

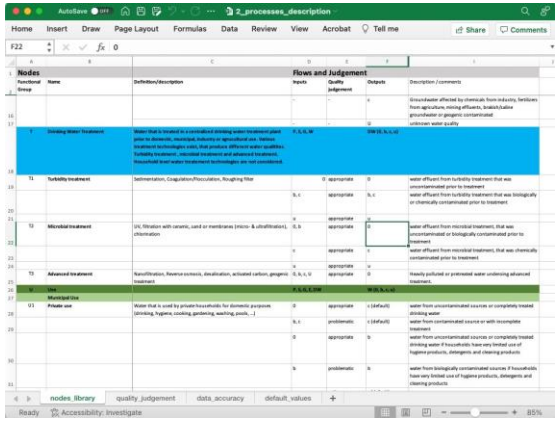
works also for Sanitation

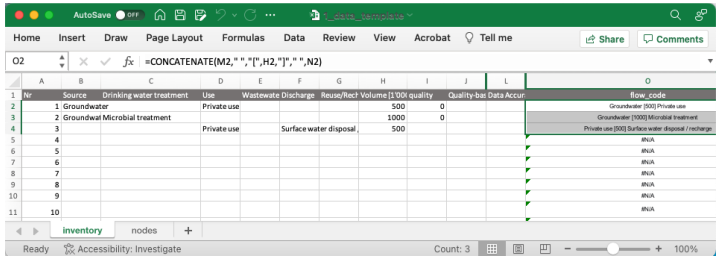
Methodology Package (being tested)

Step-by-Step guide



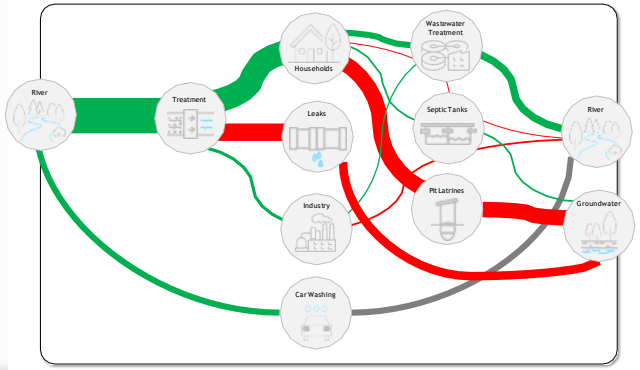
Nodes and flow libary and data collcetion sheet





SankeyMATIC

Visual templates



Join us!

Contact:
dorothee.spuhler@eawag.ch
lukas.bouman@eawag.ch

Case study Rio Pardo de Minas

Case study Bern

Time for Coffee and Tea

(10 minutes Break)

sustainable sanitation alliance

WG 06: Cities (Part 2)

Future relevance & potential of wastewater surveillance (Covid-19, AMR, …)

Kate Medlicott (WHO), Tim Julian, Dorothee Spuhler (Eawag), Said Rachida (NICD), Maria Ferreira (KWR) & Natalie Schmitz (GIZ)

sustainable sanitation alliance

Opening & Global activities WHO

Kate Medlicott (WHO)

Environmental surveillance for SARS-COV-2 to complement public health surveillance

Kate Medlicott – WHO

https://www.who.int/publications/i/item/WHO-HEP-ECH-WSH-2022.1

Context

- Firstly, it is important to remember that **COVID is not transmitted via wastewater**.
- And, **water and sanitation services are essential** in pandemic preparedness and response
- Wastewater surveillance is **not a new tool** – used for many years - polio , typhoid, illicit drugs and AMR.
- Wastewater surveillance **provides useful complementary information** to other forms of surveillance (such as diagnostic testing) **to support public health decision making**. It is not an alternative to other forms of surveillance recommended by WHO.
- Wastewater surveillance is useful because **provides population level data** on of virus circulation that is not susceptible to biases of who presents for diagnostic testing, who has access to testing and limitations of reporting.
- **In the last 2-3 years wastewater surveillance has been scaled up used in many countries** with demonstrated proof of concept *and as a r*outine component of national COVID-19 surveillance programmes
- **We can think of it like an iceberg** where the deaths and hospitalizations are at the tip and wastewater surveillance is the heavy hidden base.

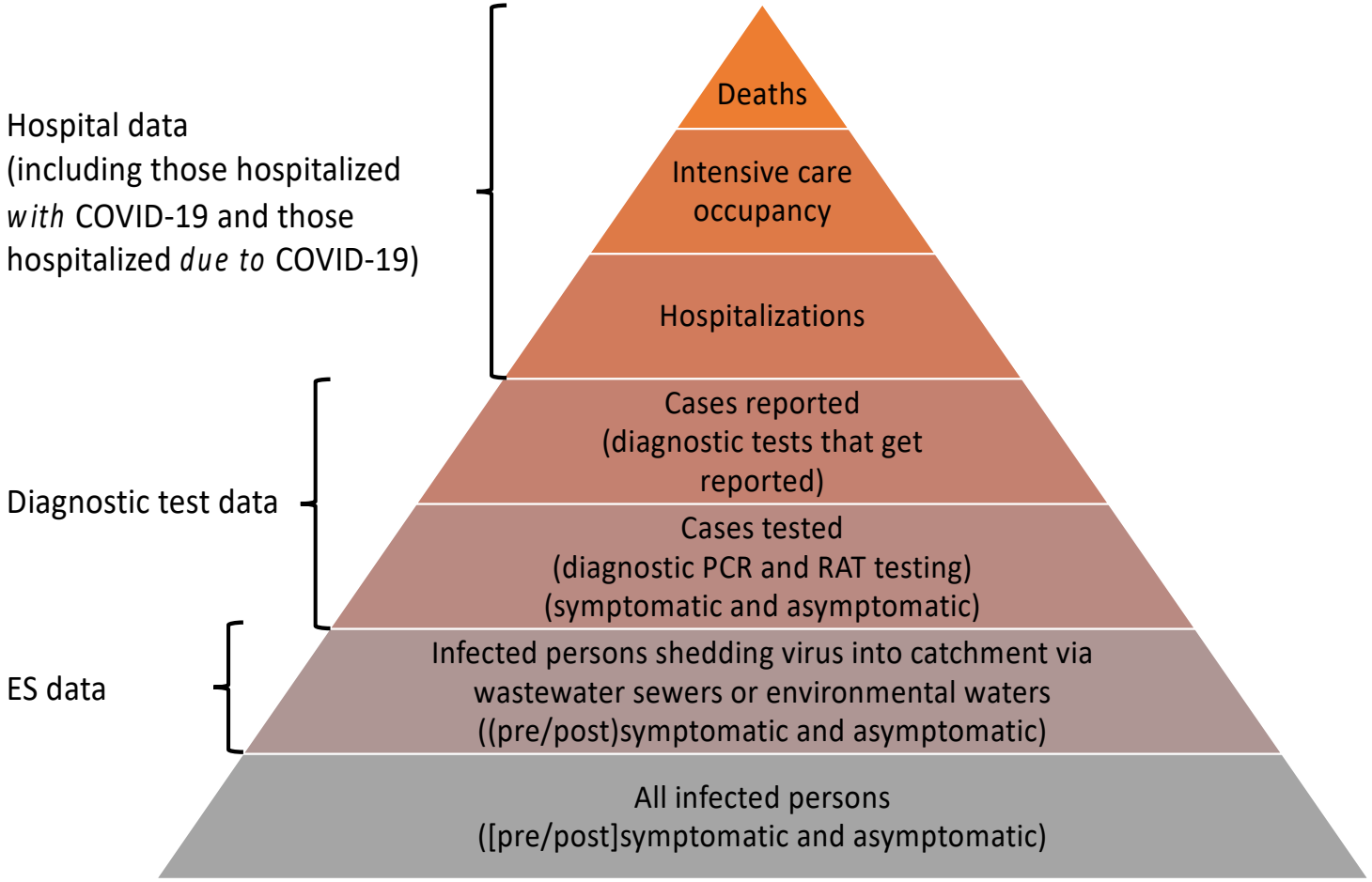


Fig. 1. Illustration of the role of SARS-COV-2 ES as a source of data on COVID-19 and SARS-CoV-2 shedding in communities via a defined wastewater catchment.

WHO guidance

Includes:

- What **situations ES adds value** to public health decision making,
- What is needed to **plan and coordinate** an effective programme,
- and **how to carry out data collection**, analysis, interpretation and communication of results.

https://www.who.int/publications/i/item/WHO-HEP-ECH-WSH-2022.1

How has wastewater surveillance been shown to help?

- Tracking **increasing and decreasing trends** at community level to help target COVID-19 responses and interventions
- Finding outbreaks in **places thought to be COVID-19-free**
- **Augmenting risk communications to help promote good behaviours** - detection in wastewater reminds the community that the virus is circulating, encourages people to seek diagnostic testing, and reduces complacency about control interventions (e.g. masking, distancing, vaccination).
- **Cost-effective targeting of public health surveillance** - Allows deployment of scarce diagnostic testing resources in hotspot areas with higher SARS-COV-2 ES signals.
- Informing early and localized **restrictions in pockets of (re-) emergence** by helping detect outbreaks
- **Targeted surveillance** for early warning of circulation in: vulnerable or high-risk settings, isolated communities, transport vessels, multi-day events and gatherings.
- Identifying existing, **known variants** of interest or concern
- Detecting emergence of **novel variants** (albeit challenging in sewage samples)
- **Biobanking and retrospective** analysis
- **As COVID becomes widespread**, willingness to present for testing may decline and the role of ES may increase in filling knowledge gaps in surveillance data

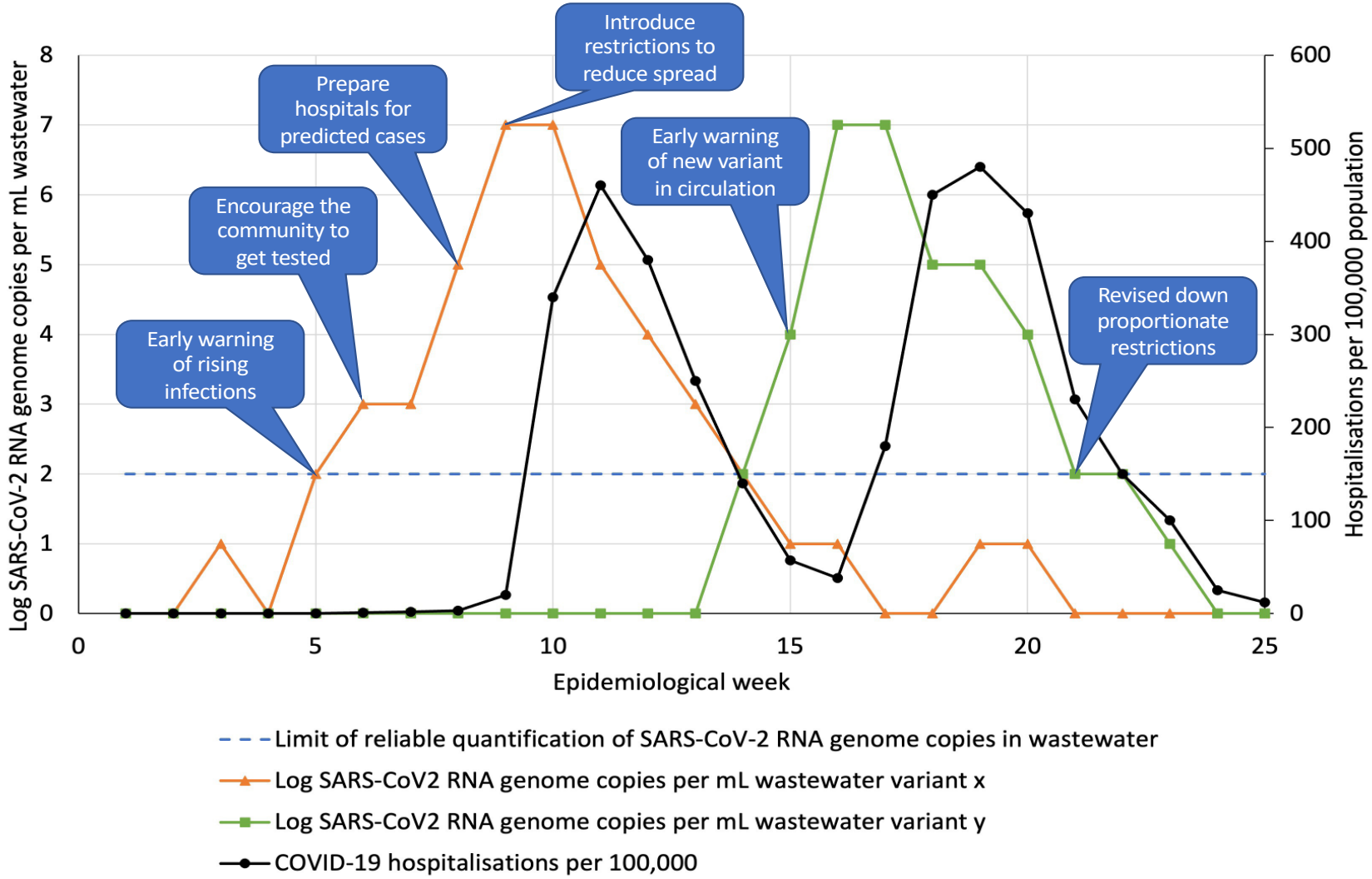


Fig. 2. Illustration ES data compared to hospitalization data and potential use cases for public communication, public health decision-making and targeting restrictions.

Some limitations

- Most implementation so far has been in high- and middle-income countries with **high coverage of sewers**. Methods need to be adapted – e.g .for sampling open drains.
- **As yet, there is not enough experience to specify standard methods** since the approaches and details of the methods being used are evolving rapidly.
- **Some ethical considerations** – especially for highly targeted populations

Key Lessons

- **Data sharing needs to be well coordinated** with COVID decision makers to make use of this early warning. As such public health leadership is key.
- **Capacity to run and sustain ES is critical** (checklist)

Box 1. Checklist of steps to initiate, establish, and implement a SARS-COV-2 ES programme

- ☐ **Identify the relevant stakeholders, and their needs, expectations, and willingness and ability to participate.** Outline what the ES programme should look like and the actors that need to participate at national and regional levels. Assess which actors are already engaged. Understand the receptivity and interest of the necessary actors to participate. They include the primacy public health agency, the COVID-19 incident management and control agency, the wastewater management agency, and actors undertaking wastewater sampling, processing of samples and molecular genetic testing. Ideally, normative bodies that provide laboratory standards, review and accreditation as part of quality assurance.
- ☐ **Identify a lead agency or collective that will be responsible for the ES programme**. The lead is typically a public health agency, a COVID-19 incident management and control agency, or a collective (in which the public health agency plays the major role).
- ☐ **Understand the technical, organizational, and financial capacity of the participating stakeholders**. An ES programme will be limited by these factors. It may be possible to capacities, but this will take time. Capacity limitations on supporting services and supp should also be considered and managed – some laboratory reagents, equipment, and can be in short supply or take time to arrive. Funding needs to be committed to the pr both setting it up and maintaining it. Funding aspects need to be reviewed in response changing circumstances, including in moving to endemic COVID-19, and applications o COVID-19.
- ☐ **Explicitly define and communicate the objectives of the ES programme**. Primary objectives would typically include tracking trends in community SARS-CoV-2 R providing early warning of the emergence of COVID-19 cases, indications of changes ir incidence and incursion and spread of variants. Secondary objectives might include pr information for research to inform responses to future pandemics, including novel SAI mutations or other pathogens.
- ☐ **Identify the scale of the ES programme**. Typically, the ES programme is delivered at th scale as the public health and COVID-19 public health surveillance and control services example, site, local/city government, national, transnational or regional scale. In some ES programme can be tiered, with local or regional programmes being linked to nation transnational programmes.
- ☐ **Liaise with the COVID-19 management and control agency to maximize value.** Set up relationships with the COVID-19 incident management and control agency to enable t interaction to tailor the programme to meet information needs. Communicate the opt opportunities and limitations of ES to the agency. Set up procedures to integrate and r data to the agency to support decision-making. Pre-plan health actions as response to Align sampling points with areas covered by diagnostic testing and hospitalization surv the extent possible. Set up data dictionaries, data management systems and reporting and dashboards for coordination and data sharing.
- ☐ **Identify opportunities to build on existing capacities to ensure time and cost efficien** sampling with existing sampling programmes. Transport samples using existing channe (e.g., existing sampling points and points of analysis). Identify laboratories with experi detecting viruses in wastewater and in molecular methods. If possible, make use of ot wastewater surveillance programmes (e.g., for polio, typhoid, antimicrobial resistance illicit drugs).
- ☐ **Agree on sampling and analytical methods and procure equipment and consumables.** Depending on the setting and existing capacity of the lead ES agency, significant investment in equipment and capacity for sample collection, transport, analysis and interpretation may be needed. Decisions should be made on whether analyses of samples will be conducted at a single centre or multiple centres. In the latter case, interlaboratory comparison is essential. Standard operating procedures are needed for steps such as safe sampling and sample handling, collection, storage and transfer, location naming and container labelling. Ideally, identify a central laboratory that can support training, consistent materials and supplies, harmonization of methods and result reporting, and undertake auditing, accreditation and certification services.
- ☐ **Train personnel.** Training approaches can include written protocols, procedural flow diagrams, videos and in-person demonstrations, and competency assessments. For instance, wastewater treatment plant and other wastewater workers need to be properly trained to safely collect wastewater samples. Training for laboratory personnel in safely handling wastewater samples, and appropriate analytical methods, needs to be tailored to the level of experience and expertise of the staff, and the tools and equipment available.
- ☐ **Clarify the coordination and data-sharing arrangements for end use of the data.** Where ES is conducted by a different agency or entity to the public health surveillance or COVID-19 control agency, clarity is needed at the outset on coordination mechanisms, data needs to fill gaps and uncertainties in public health surveillance, and timely mechanisms for sharing and interpretation of data for use in the response strategy.
- ☐ **Set up a database to collate and communicate relevant data and information.** Typical information captured for each sample includes method of sample collection, location, date, sample type, catchment represented, laboratory assay performed, and result. Ideally, the ES evidence is readily and directly linked to public health surveillance from the same period. Be clear about what information is to be captured within the database and how it is to be uploaded, quality assured, accessed, used and presented. If multiple actors can access the database, include options to identify planned, in progress and historical programmes. Ensure that information flow and communication channels allow timely, good-quality, fit-for-purpose information to be transferred from the ES programme to the COVID-19 control agency.
- ☐ **Develop means to communicate the programme to stakeholders and the public.** Set up public reporting systems, such as spatial map displays, timeline graphs, summary tables, and dashboards, paired with public health advice that encourages adherence with public health measures in place. Set up processes to engage with the public, wastewater workers, plumbers and the media. Provide training to persons involved in the program so that they understand SARS-COV-2 ES, their role in the programme, and the value of the data provided. Be proactive with communications, such as allaying concerns about infectious virus being present, noting only RNA is being detected. Note that the data is not being used for individual identification such as sequencing of human genetic information.
- ☐ **Ensure ongoing sustainability and reliability of the programme.** Gain formal commitment from relevant actors and ensure adequacy of resourcing (human resources, technical capability and competency, required facilities and funding). Ensure ongoing training and maintenance of capacity, sourcing of revenue, and management of the data by the health and COVID-19 incident management and control agency. Ensure reliability of supplies and equipment (suppliers and supply chain). Ensure that results will be shared in a timely manner and will be used to inform public health action.

Outlook

- New targets of interest – e.g. monkeypox
- Multi-pathogen surveillance

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Swiss wide dashboard tool

Tim Julian & Dorothee Sphuler (Eawag)

Swiss-wide Monitoring of SARS-CoV-2 in Wastewater

eawag
aquatic research

Team / Acknowledgements

EPFL

Federica Cariti
Xavier Fernandez-Cassi
Tamar Kohn
Joseph Lemaitre
Alex Tunas Corzon

eawag aquatic research

Carola Bänziger
Lea Caduff
Alexander Devaux
Christian Förster
Charlie Gan
Pravin Ganesandamoorthy
Tim Julian
Anina Kull
Christa McArdell
Christoph Ort
Andreas Scheidegger
Elyse Stachler
Blanche Wies

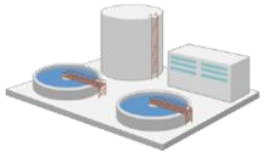
Communication, Support, Workshop, ...

CHUV Centre hospitalier universitaire vaudois

Gilbert Greub

ETH zürich D BSSE

Catharine Aquino
Niko Beerenwinkel
Chaoran Chen
David Dreifuss
Lara Fuhrmann
Jana Huisman
Kim Philipp Jablonski
Katharina Jahn
Fabian Rudolf
Jeremie Scire
Taru Singhal
Tanja Stadler
Ivan Topolsky



Staff 22 WWTPs

EPFL

eawag aquatic research

FNSNF
Fonds national suisse
Schweizerischer Nationalfonds
Fondo nazionale svizzero
Swiss National Science Foundation

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Office for the Environment (FOEN)

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Office of Public Health (FOPH)

SIB Swiss Institute of Bioinformatics

Covid-19 offered an unprecedented opportunity to highlight the utility of wastewater-based epidemiology for infectious diseases

Why WBE works for Covid-19

- SARS-CoV-2 RNA Shed in Feces (*10^2-10^5 particles per day?*)
- Large susceptible population
- Most highly surveilled pathogen in history

Switzerland and Liechtenstein

Tests / 100 000 inh.	258 168,59
Tests	22 484 819
Share of positive PCR tests	22,5%
Share of positive rapid antigen tests	12,8%

hCoV-19 data sharing via GISAID

12,714,926

genome sequence submissions

Why WBE works for Covid-19

- SARS-CoV-2 RNA Shed in Feces (*10^2-10^5 particles per day?*)
- Large susceptible population
- Most highly surveilled pathogen in history

Benchmark WBE:
Spoiler! It works.

Switzerland and Liechtenstein

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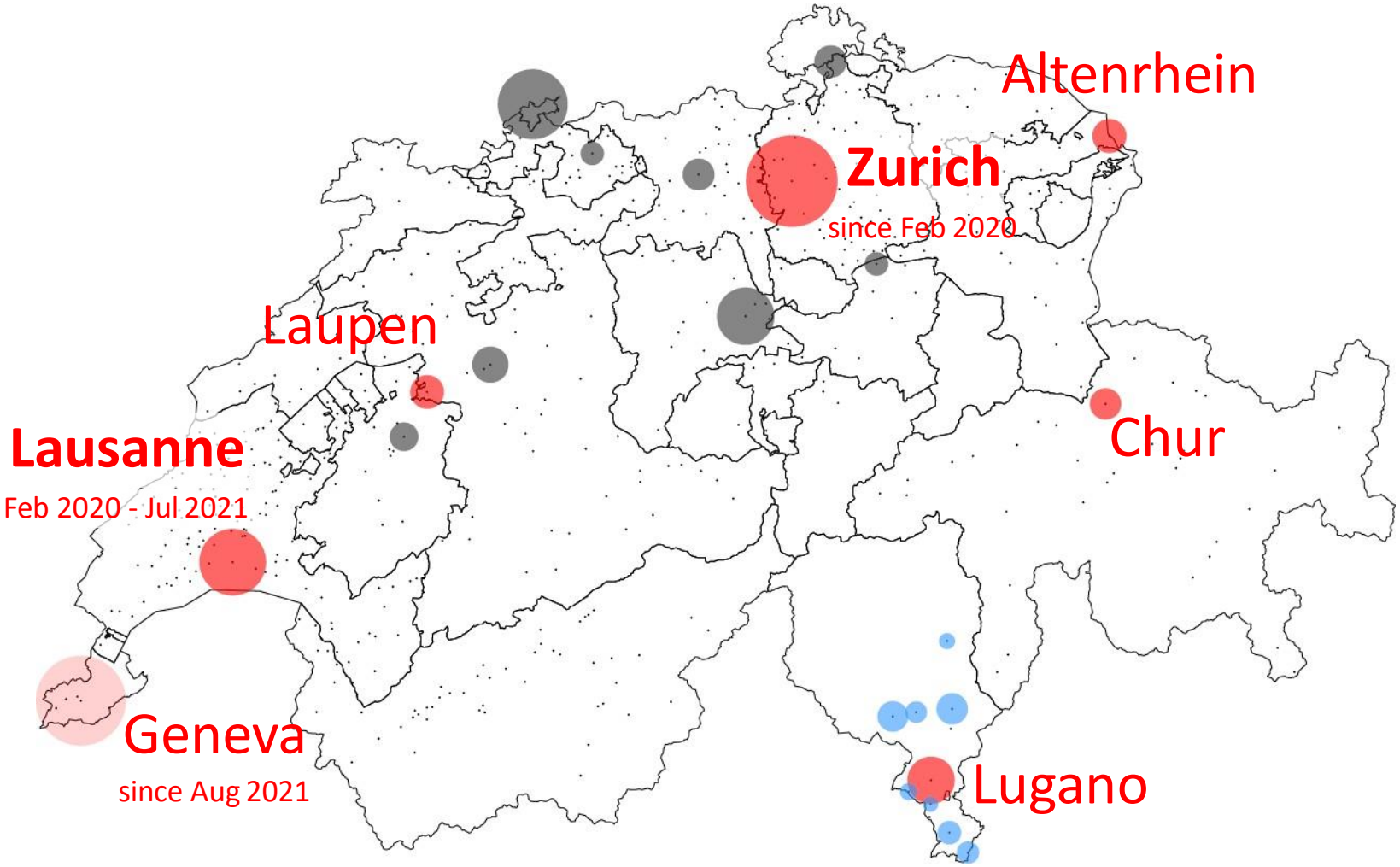
Share of positive PCR tests	22,5%
Share of positive rapid antigen tests	12,8%

hCoV-19 data sharing via GISAID

12,714,926

genome sequence submissions

What we're doing in Switzerland



Feb 2020 – May 2020

9 WWTPs Ticino, Zurich & Lausanne

Oct/Nov 2020

8 WWTPs + 6 WWTPs

Feb 2021 – Jul 2022

>1 mio. people (>11% nat. pop.)
daily samples (24h composites)
dPCR (gene count N1)
NGS (VoC)
R_e

Data Collection and Analysis

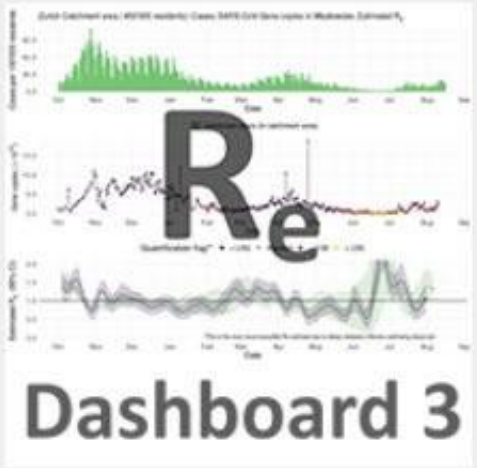
Team EPFL / Eawag
T. Kohn / T. Julian, C. Ort

Team ETHZ
N. Beerenwinkel

Team ETHZ
T. Stadler

Number of gene copies

Mutations (NGS)

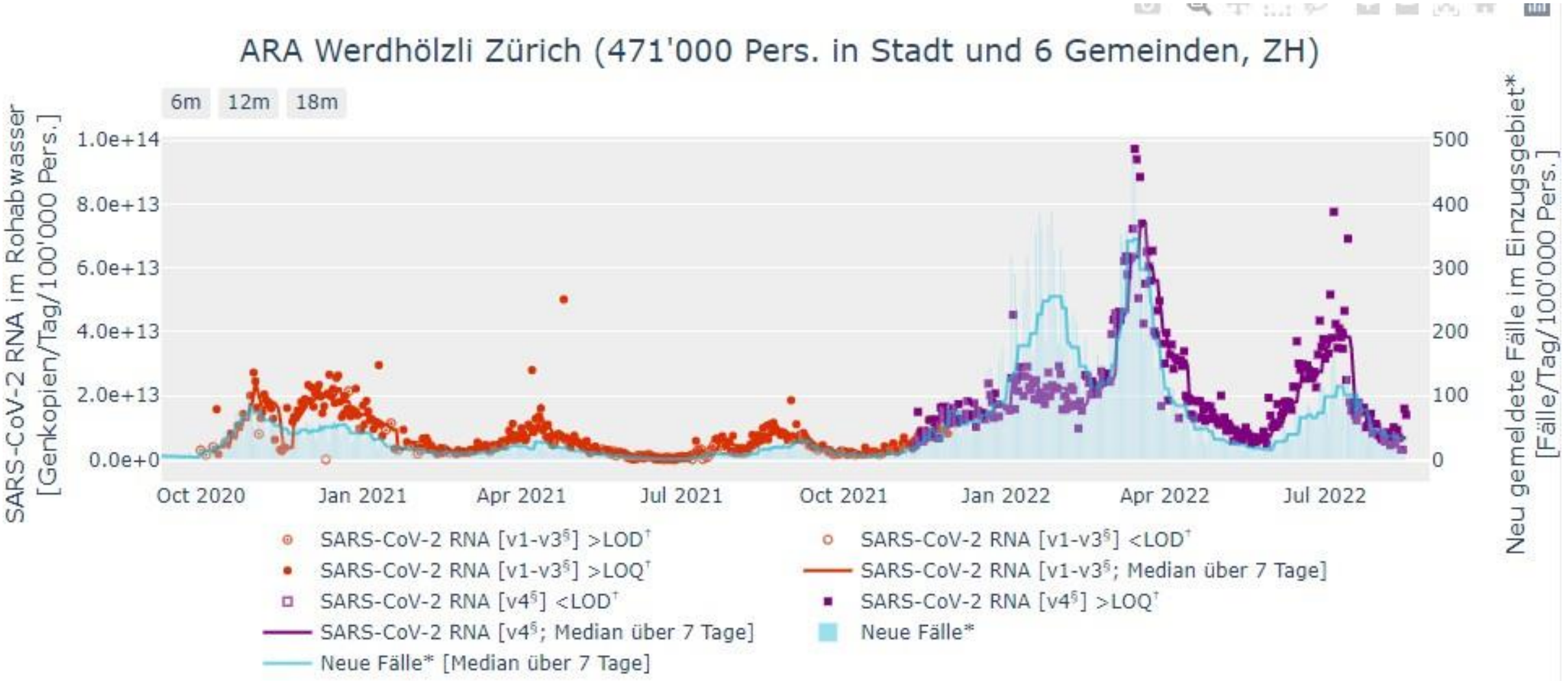


Reproduction figures

Variants (dPCR)

www.eawag.ch/covid19_sewage

SARS-CoV-2 loads track cases

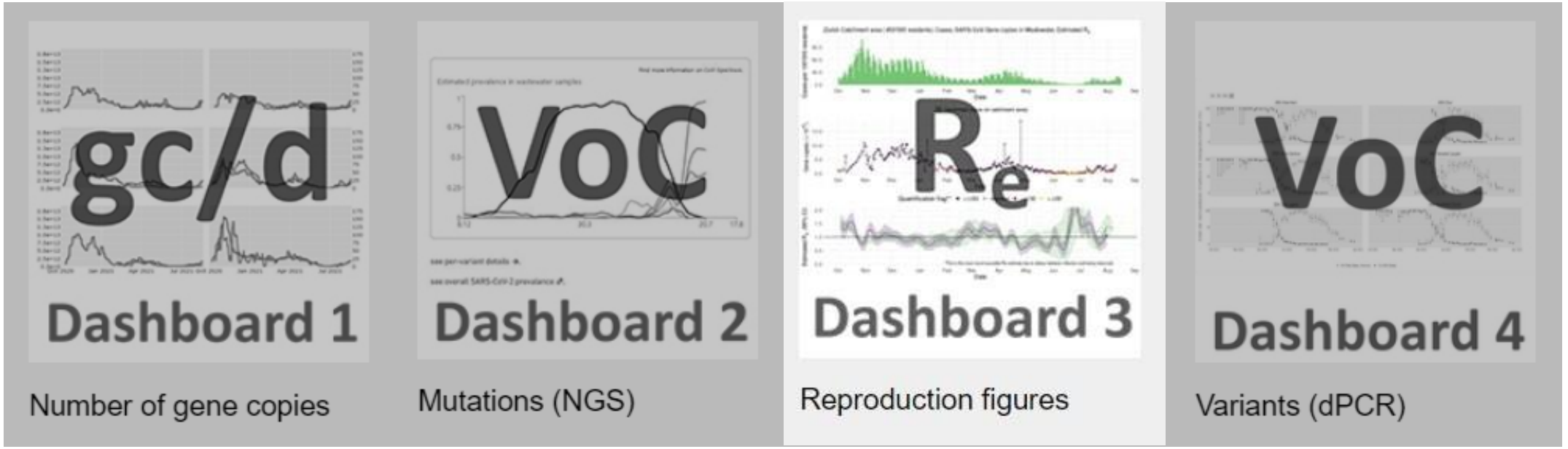


Reproduction Number

Team EPFL / Eawag
T. Kohn / T. Julian, C. Ort

Team ETHZ
N. Beerenwinkel

Team ETHZ
T. Stadler



www.eawag.ch/covid19_sewage

Translating Wastewater Data to Public Health

eawag aquatic research

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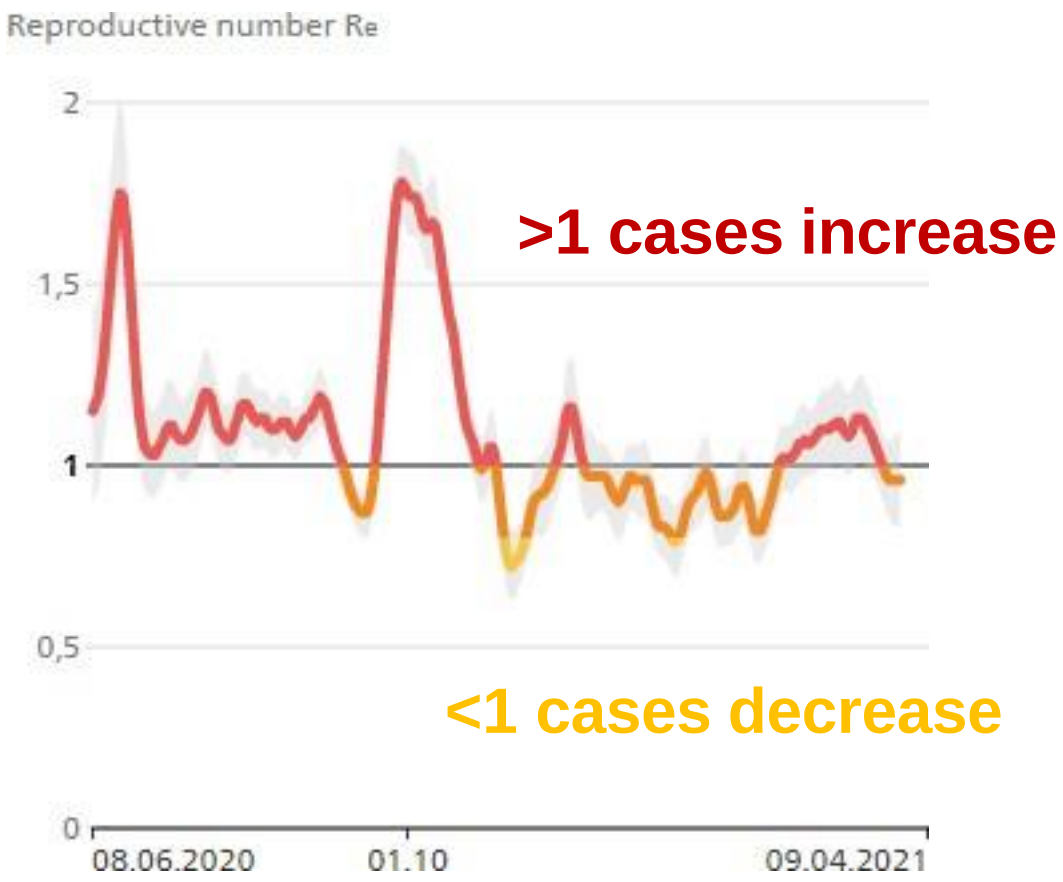
Confederaziun svizra

Federal Office of Public Health FOPH



Estimate Effective Reproduction Number

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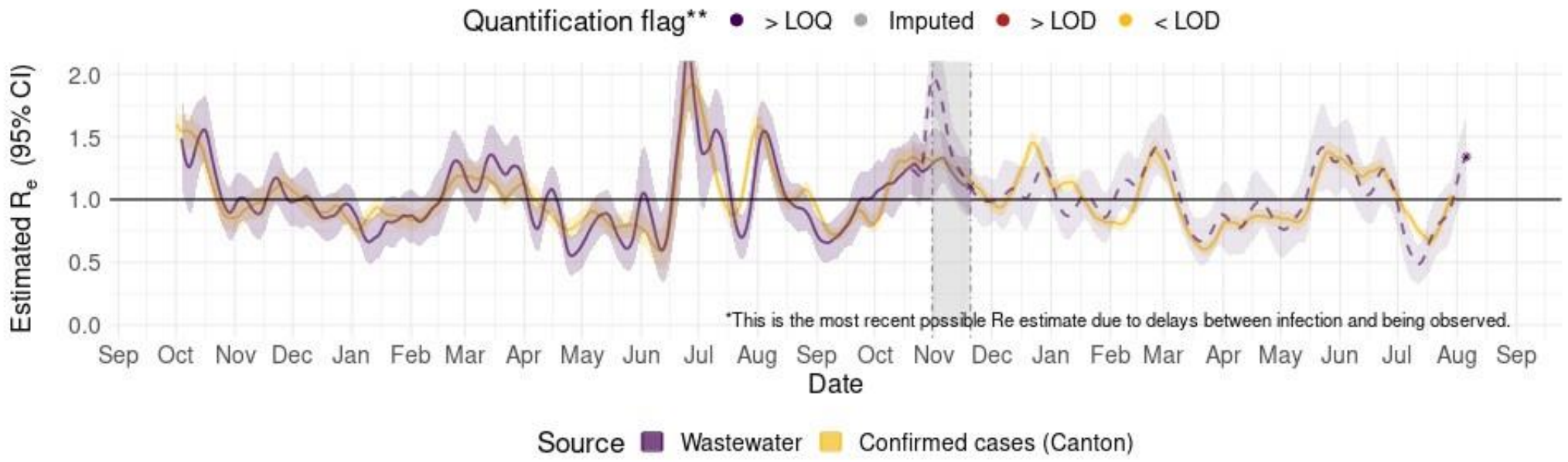
Confederazione Svizzera
Confederaziun svizra

Federal Office of Public Health FOPH



ehp Environmental Health Perspectives

HOME ISSUE IN PROGRESS ARCHIVES COLLECTIONS AUTHORS REVIEWERS ABOUT

Open Access

Vol. 130, No. 5 | Research

Wastewater-Based Estimation of the Effective Reproductive Number of SARS-CoV-2

is companion of

Jana S. Huisman, Jérémie Scire, Lea Caduff, Xavier Fernandez-Cassi, Pravin Ganesanandamoorthy, Anina Kull, Andreas Scheidegger, Elyse Stachler, Alexandria B. Boehm, Bridgette Hughes, Alisha Knudson, Aaron Topol, Krista R. Wigginton, Marlene K. Wolfe, Tamar Kohn, Christoph Ort, Tanja Stadler, and Timothy R. Julian

Published: 26 May 2022 | CID: 057011 | https://doi.org/10.1289/EHP10050 | Cited by: 1

Variants of Concern (NGS)

Team EPFL / Eawag
T. Kohn / T. Julian, C. Ort

Team ETHZ
N. Beerenwinkel

Team ETHZ
T. Stadler

Number of gene copies

Mutations (NGS)

Reproduction figures

Variants (dPCR)

www.eawag.ch/covid19_sewage

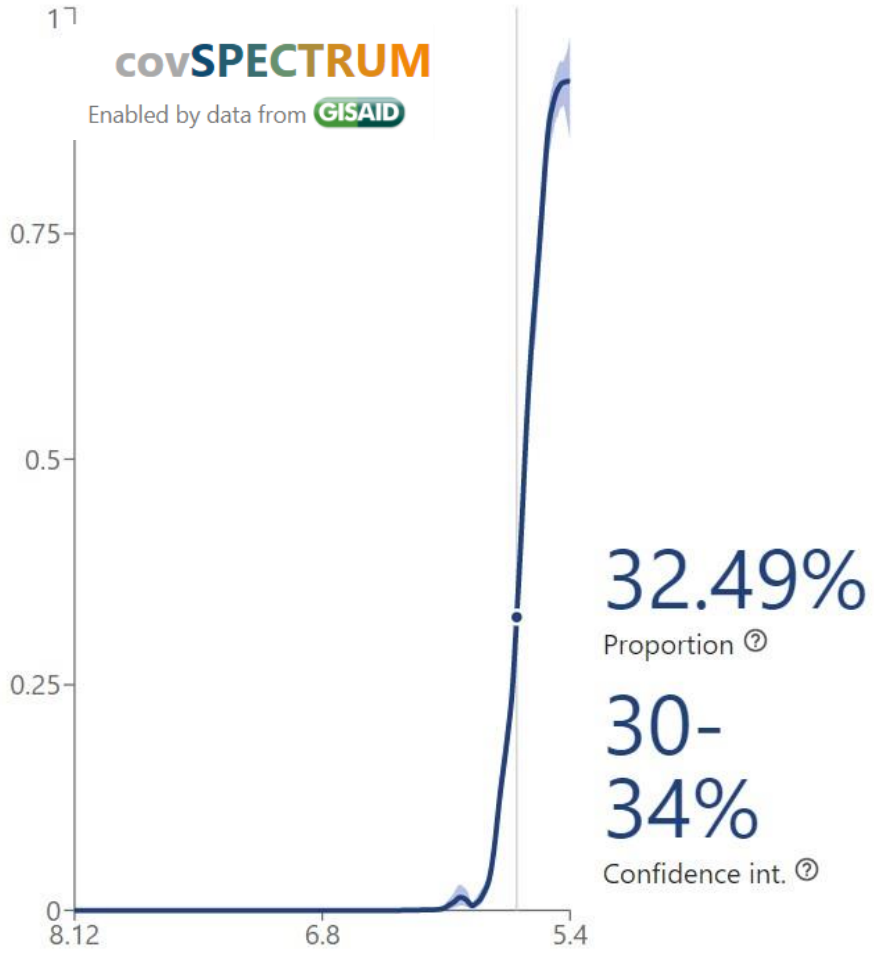
Tracking through co-occurrence of mutations

eawag aquatic research

Estimated proportion

Export

Estimated prevalence in wastewater samples on **12.2**



32.49%
Proportion

30-34%
Confidence int.

Occurrences of individual mutations

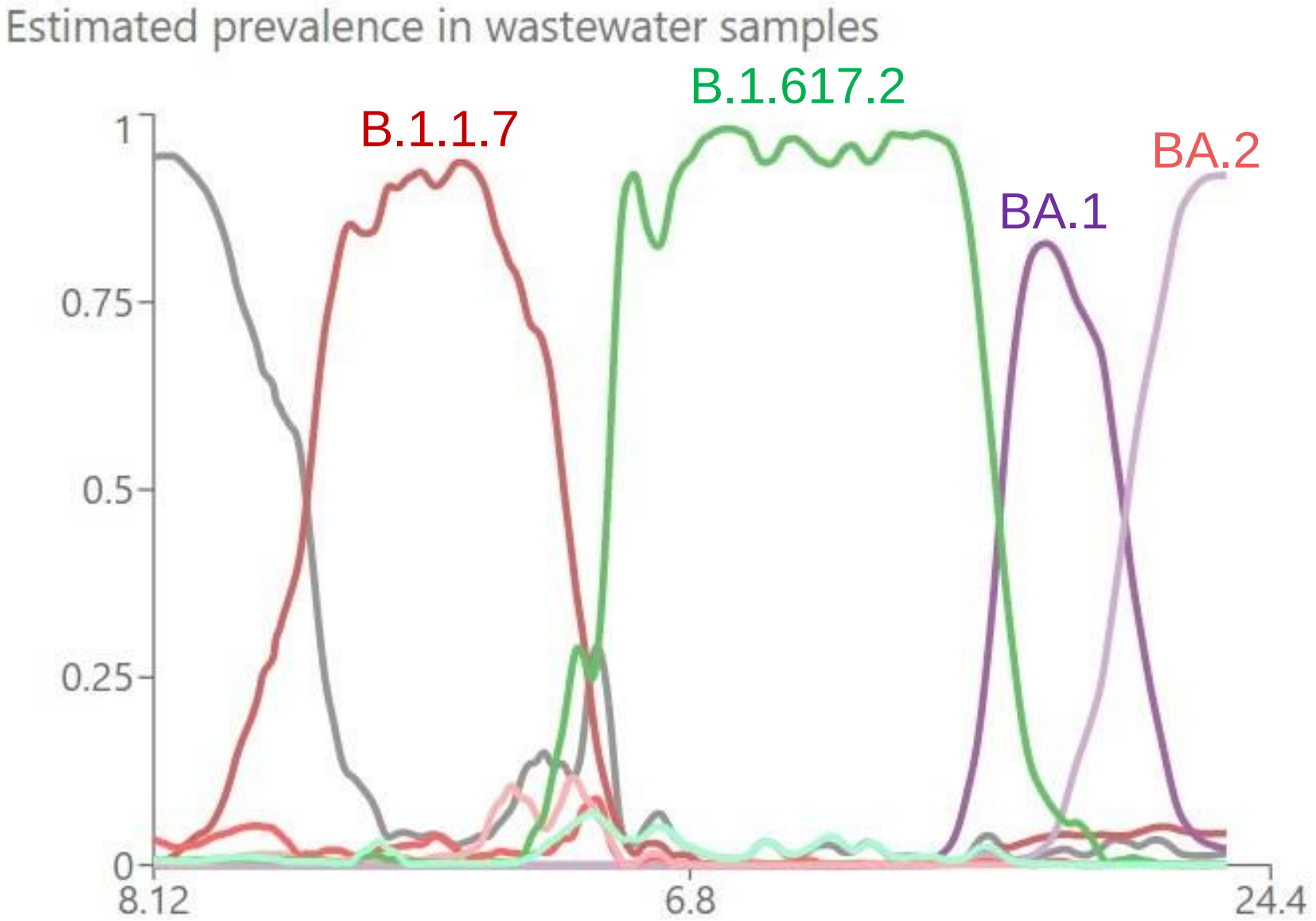
Export

Occurrence of **29510C** in wastewater samples on **12.02**

V-pipe

34.85%
Proportion

Wastewater to detect Variants of Concern



V-pipe

Variants of Concern (NGS)

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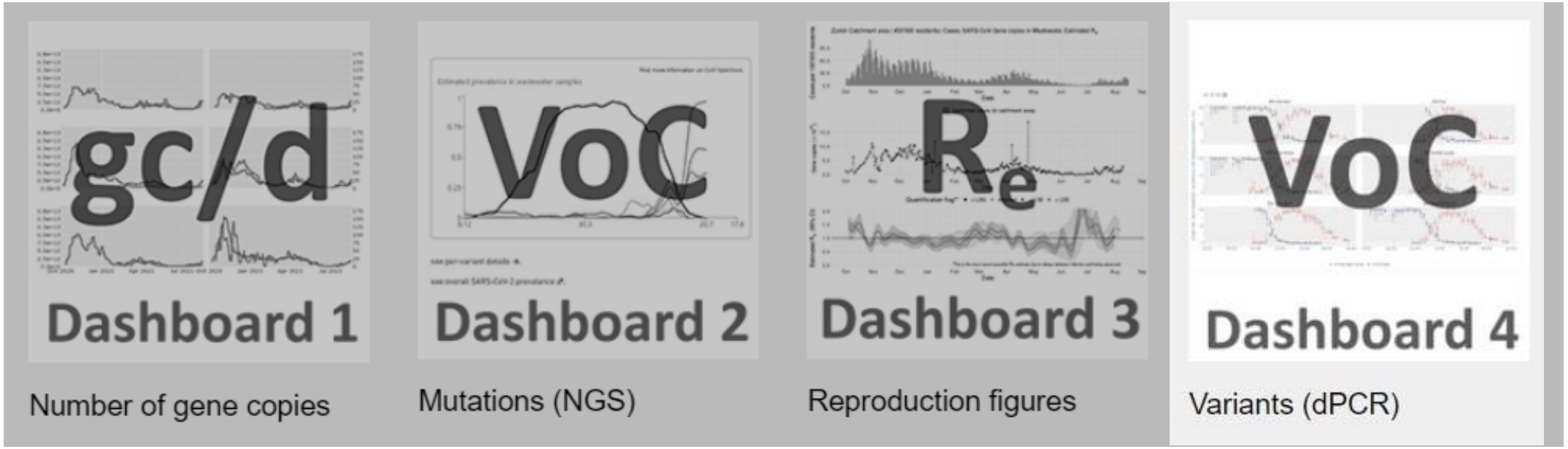
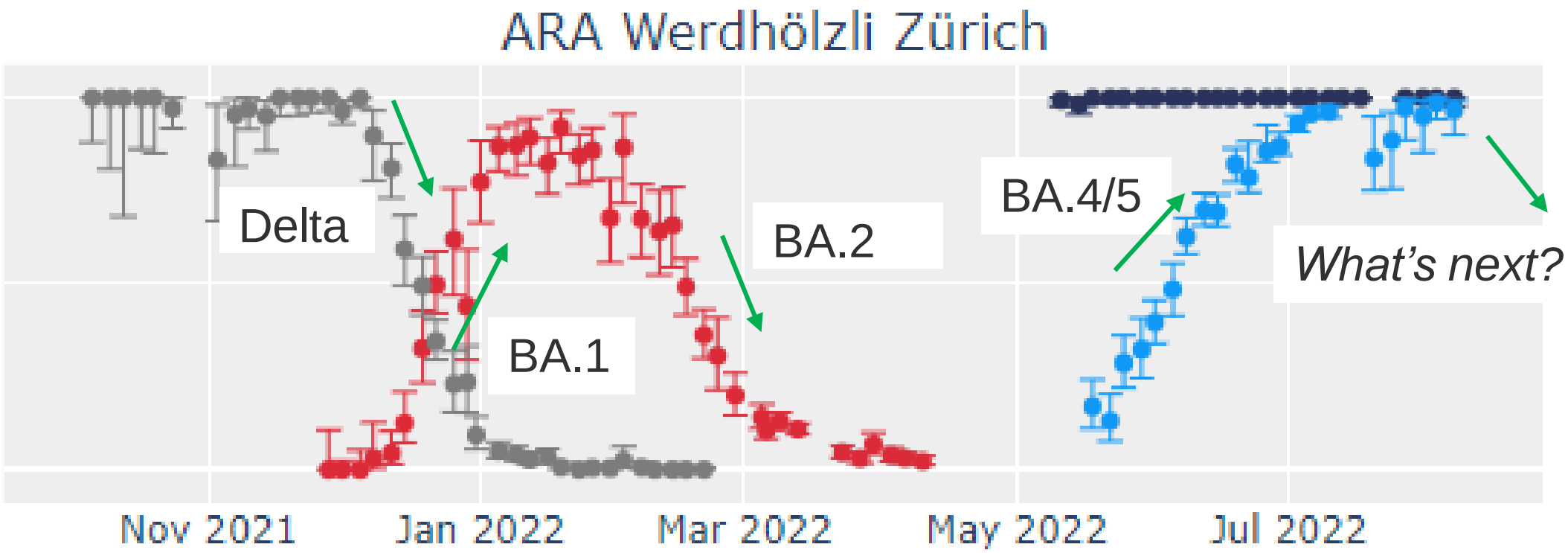
T. Stadler



www.eawag.ch/covid19_sewage

Monitoring for Signature Mutations Indicates VOCs

S:L452R
S69:70
ORF1a
S:L452R

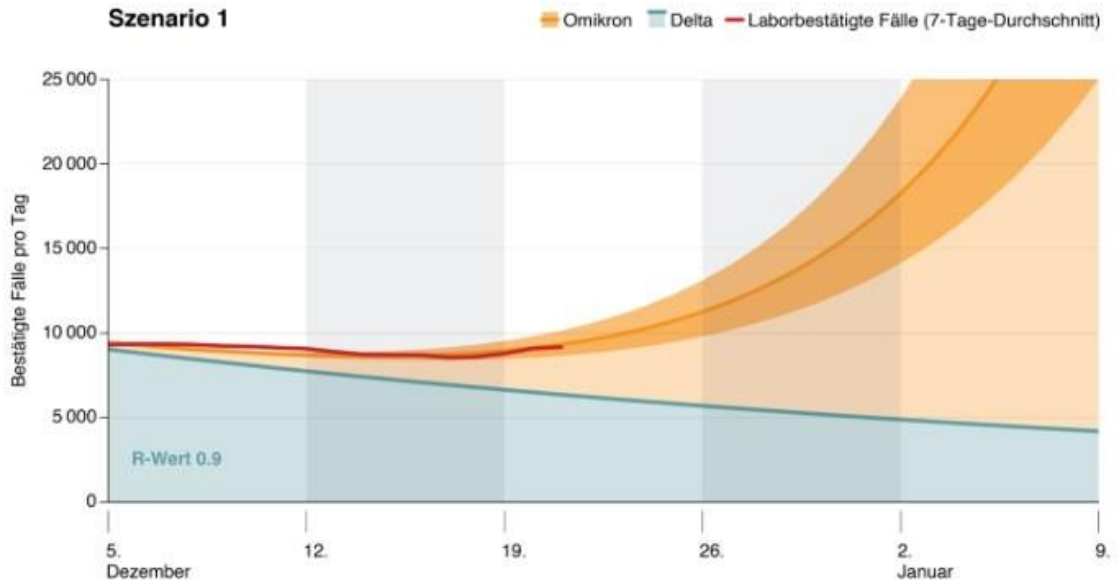


Wastewater estimates inform Swiss policy

Epidemiologische Lagebeurteilung, 27. Dezember 2021

SWISS NATIONAL COVID-19 SCIENCE TASK FORCE

basierend auf allen verfügbaren Sequenz-Daten. Unabhängige Schätzungen basierend auf «S gene target failure» Daten aus Genf kommen auf 0.26-0.32[22]. Schätzungen basierend auf Abwasserproben kommen auf 0.23 (0.19 – 0.28) für Zürich und 0.27 (0.20-0.34) für Genf [23].



D. Dreifuss, N. Beerenwinkel

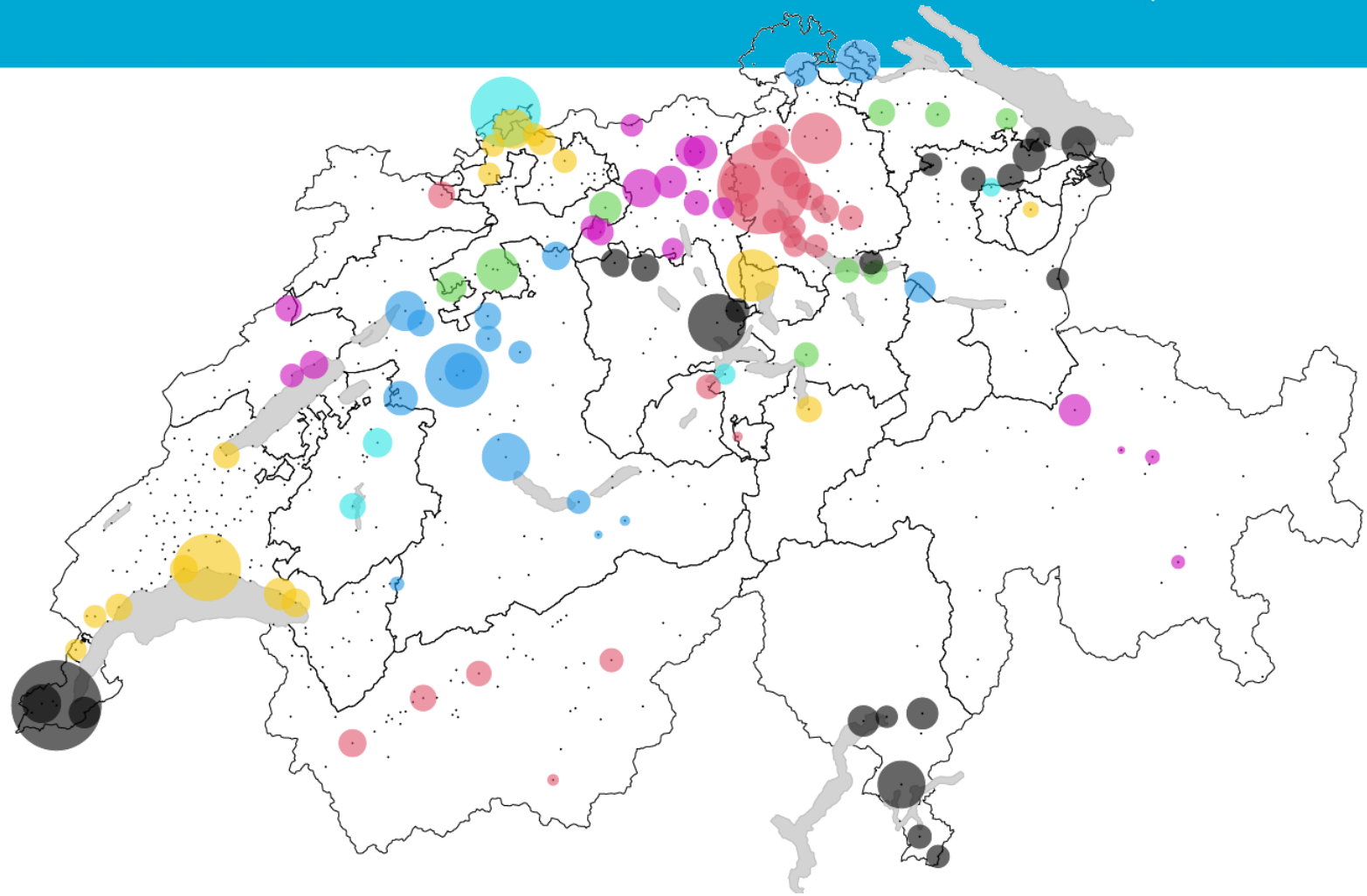
National Monitoring Program

Coverage

- 100 largest WWTPs
- at least one per canton
- biggest tourist areas
- ⇒ 70% CH population

Sampling

- 3-6x per week
- Feb - Dec 2022



«establish a WBE tool to track the current and future disease outbreaks»

«a future emergency surveillance network in Switzerland could consist of 19 WWTPs covering 2.5 million people»

«our approach is not limited to COVID-19» ⇒***SNSF Sinergia project WISE - Wastewater-based Infectious Disease Surveillance***

Public Facing Dashboard Included In Information Report

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Office of Public Health FOPH

COVID-19 Switzerland

Information on the current situation, as of 16 August 2022

The key figures will be published each Tuesday at 15:30.

Overview | Epidemiological course | Vaccinations | Hospital capacity | Weekly comparison

Status report, Switzerland and Liechtenstein

Viral load in wastewater

Source: FOPH – Status: 16.08.2022, 08.00h

Relative viral load	Number of treatment plants	Proportion of treatment plants
0-20%	81	**81,8%**
20-40%	16	**16,2%**
40-60%	2	**2,0%**
60-80%	0	**0,0%**
80-100%	0	**0,0%**
Total	99	**100,0%**

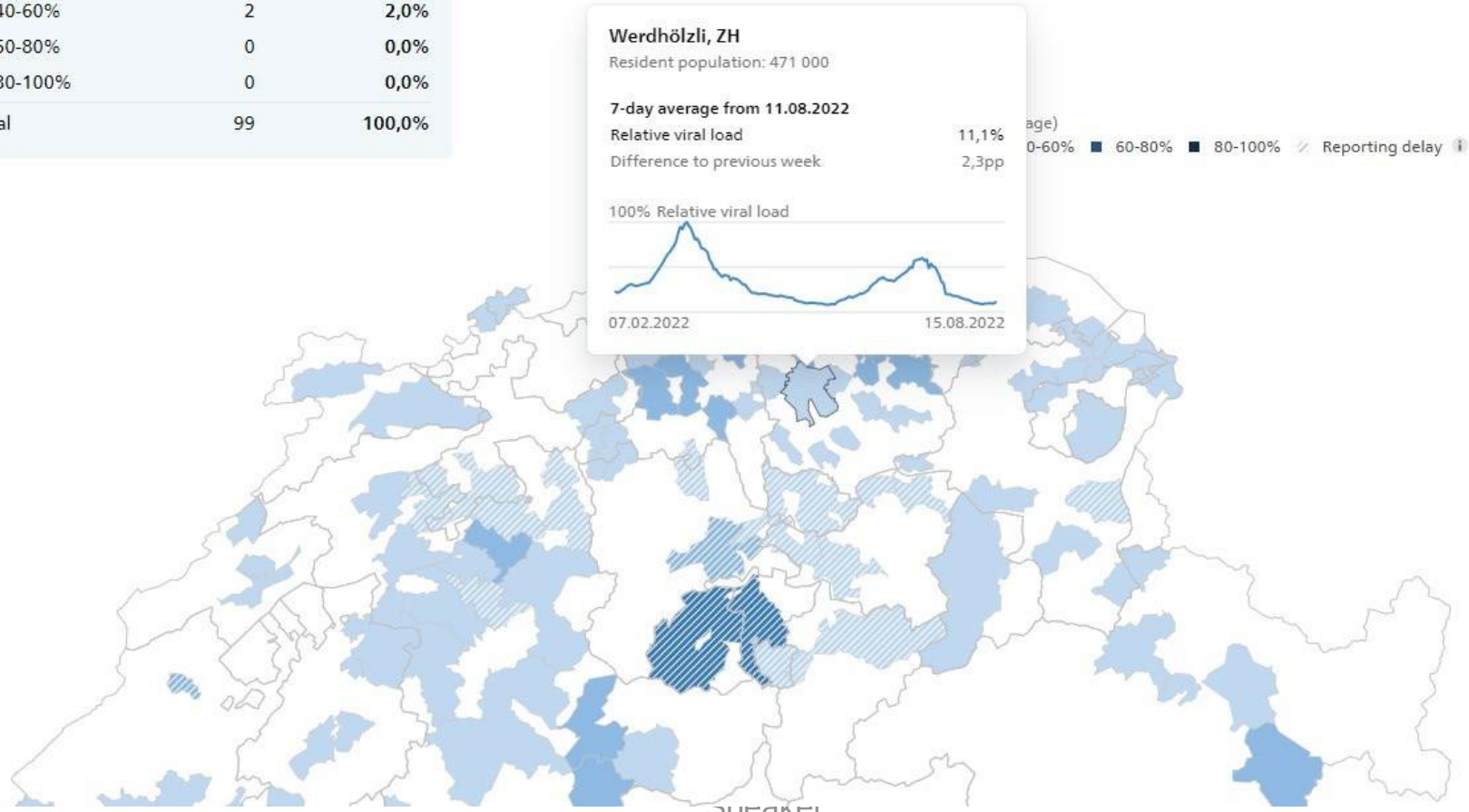
Detailed Information >

https://www.covid19.admin.ch/en/epidemiologic/waste-water

Includes Time Series Data For All Sites

Switzerland and Liechtenstein

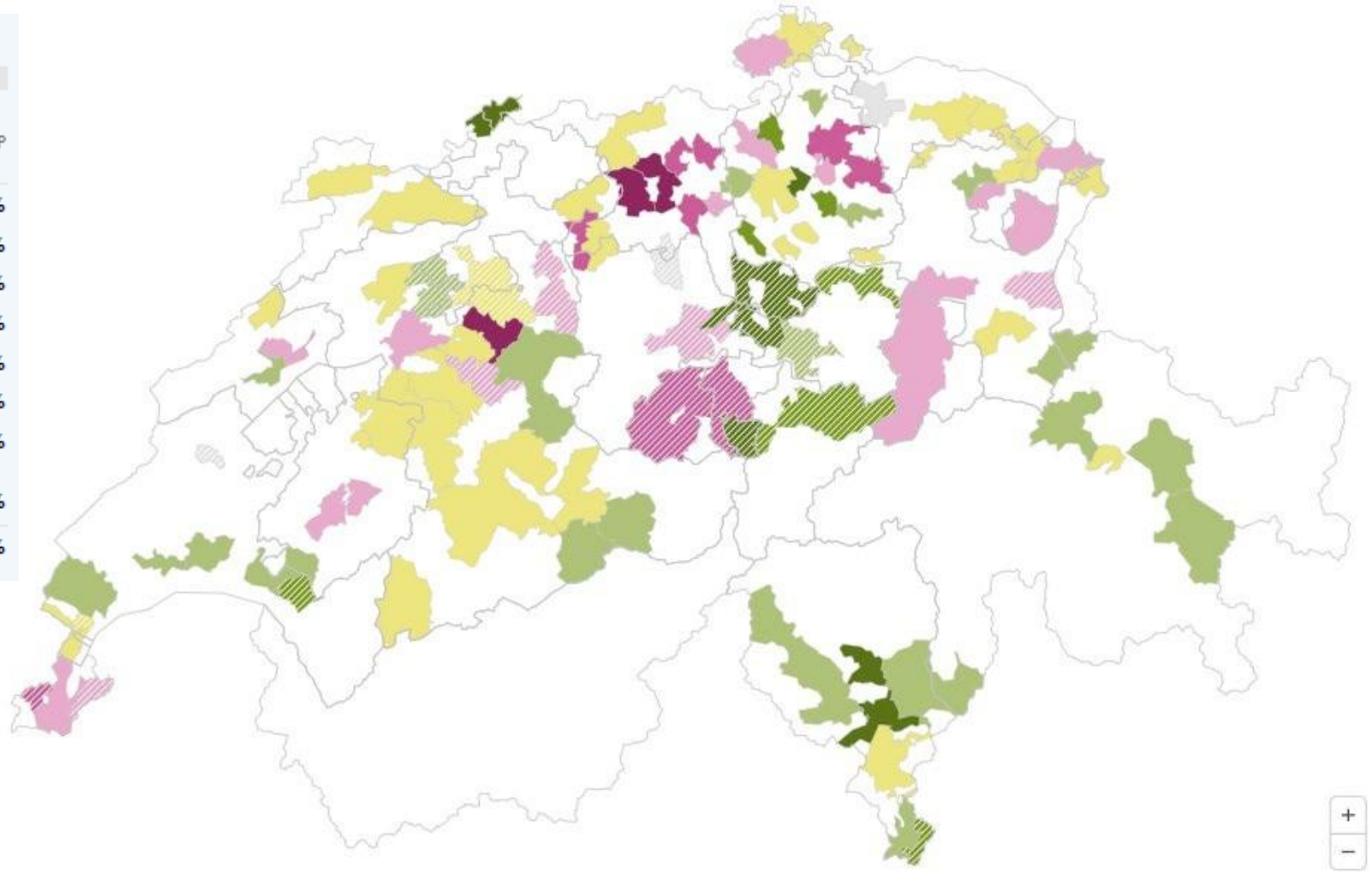
Relative viral load	Number of WWTP	Proportion of WWTP
0-20%	81	81,8%
20-40%	16	16,2%
40-60%	2	2,0%
60-80%	0	0,0%
80-100%	0	0,0%
Total	99	100,0%



Visualizations of Direction of Change

Switzerland and Liechtenstein

Difference of 7-day average compared with the previous week	Number of WWTP	Proportion of WWTP
-20pp or less	6	6,1%
-10pp to -20pp	8	8,1%
-3 to -10pp	21	21,2%
-3 to +3pp	33	33,3%
+3pp to +10pp	19	19,2%
+10pp to +20pp	6	6,1%
+20pp or more	3	3,0%
No reference value	3	3,0%
Total	99	100,0%



Download image Share

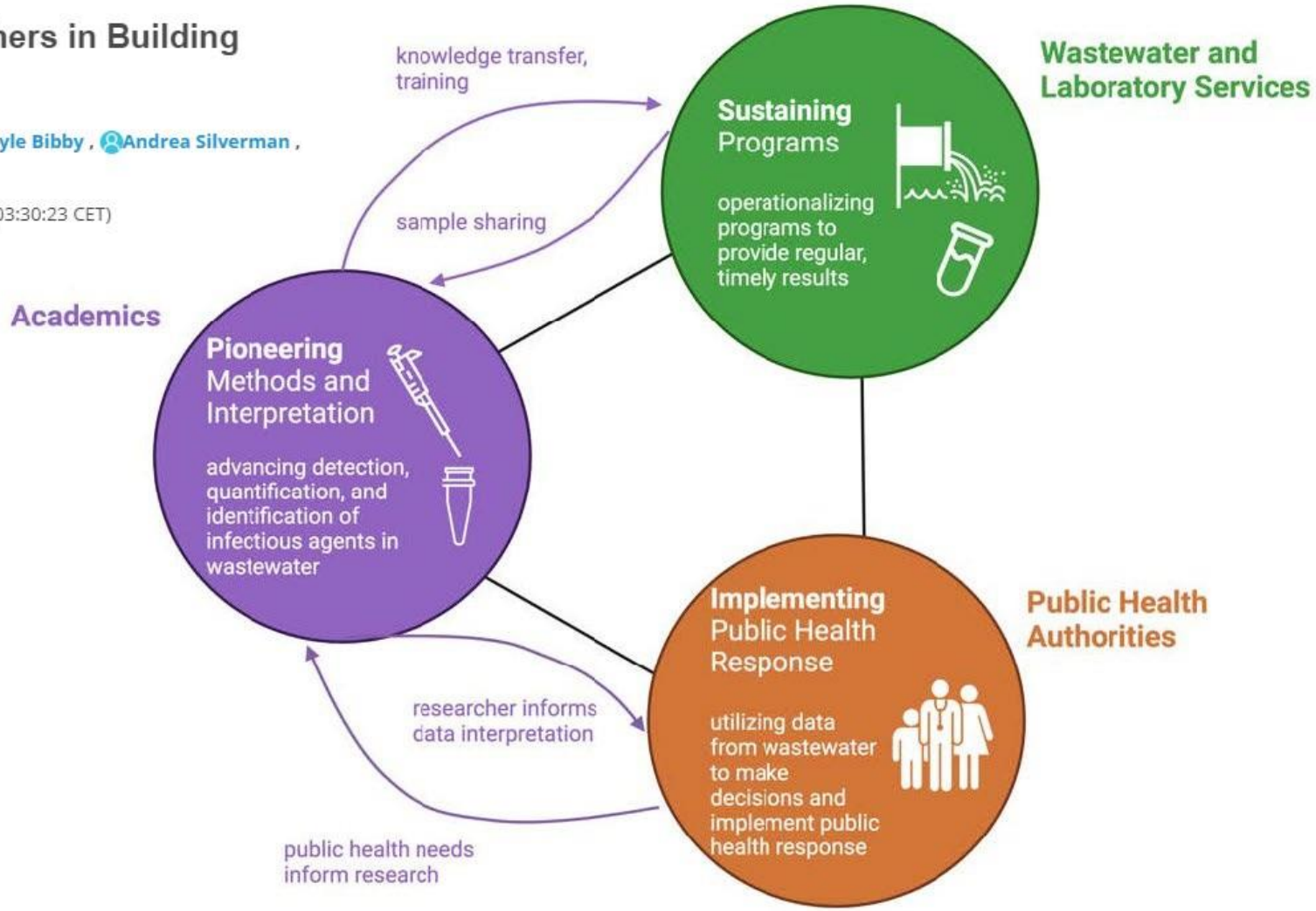
Source: FOPH – Status: 16.08.2022, 08.00h

Translation to Practice

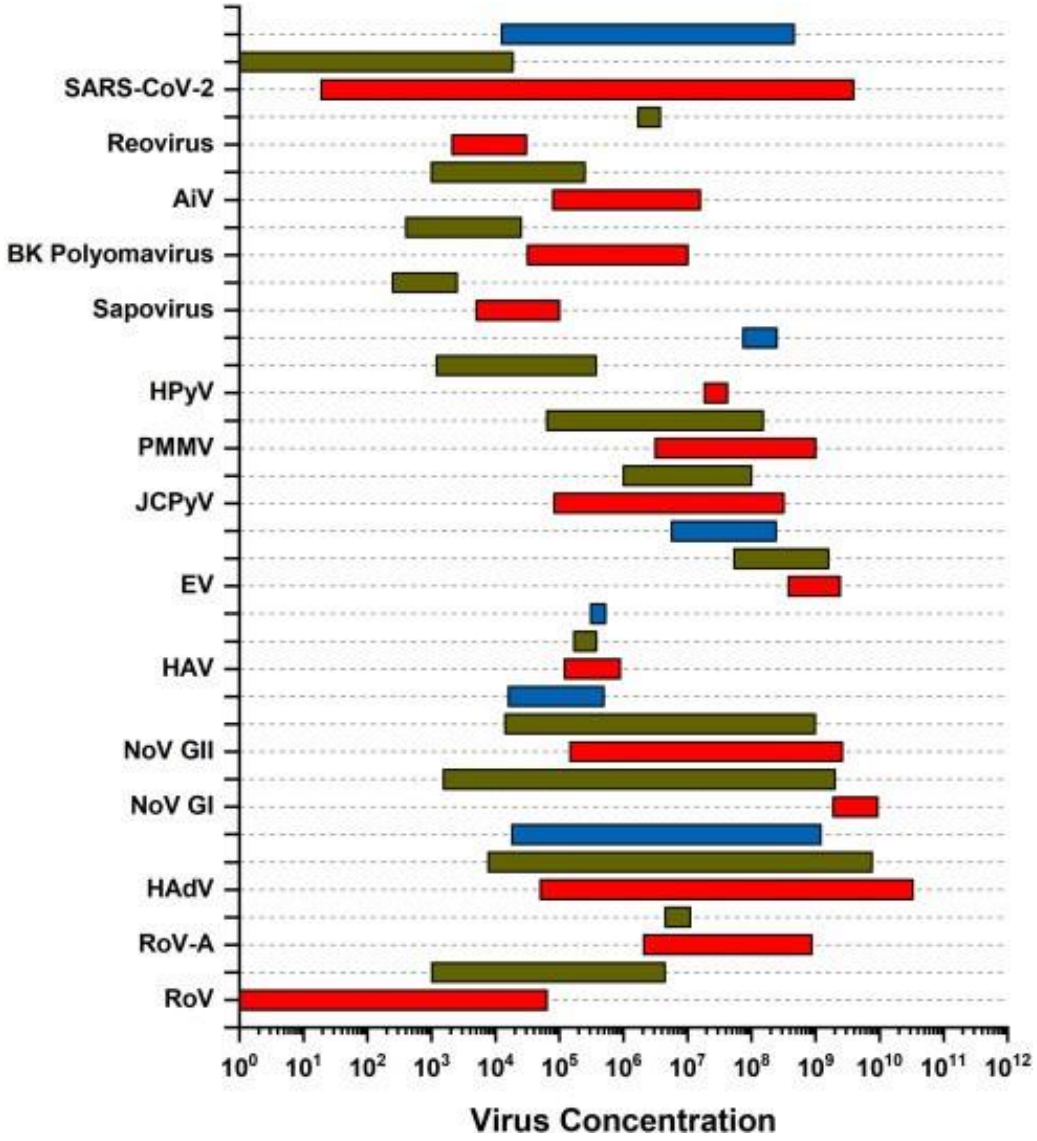
Looking Forward: The Role of Academic Researchers in Building Sustainable Wastewater Surveillance Programs

Catherine Hoar , Jill McClary-Gutierrez , Aaron Bivins , Marlene Wolfe , Kyle Bibby , Andrea Silverman , Sandra McLellan *

Version 1 : Received: 24 March 2022 / Approved: 25 March 2022 / Online: 25 March 2022 (03:30:23 CET)



Need to Demonstrate Successes Beyond SARS



Detection =

- Amount Shed in Feces
- Number of Shedders
- Sensitivity of Method
  - Concentration
  - Detection
  - Inhibition

Corpuz et al. 2020 STOTEN

Influent (virus copies/L)
Effluent (virus copies/L)
Sludge (virus copies/kg)

Outlook:

Maintain and expand network

Demonstrate utility with other priority targets

South African experiences with wastewater based epidemiology for SARS-CoV-2

SuSanA meeting

Saïd Rachida, Kerrigan McCarthy, Nkosenhle Ndlovu, Setshaba Taukobong, Mokgaetji Macheke, Chinwe Iwu-Jaja, Mukhlid Yousif

For the

SOUTH AFRICAN COLLABORATIVE COVID-19 ENVIRONMENTAL SURVEILLANCE SYSTEM (SACCESS)

South African experiences with wastewater-based epidemiology for SARS-CoV-2

FUNDERS

NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES
Division of the National Health Laboratory Service

WATER RESEARCH COMMISSION

BILL & MELINDA GATES foundation

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

PARTNERS

SACCESS

SACEMA

Scripps Research
Science Changing Life

CSIR

WATERLAB

Lumegen LABORATORIES

GREENHILL LABORATORIES

praecautio
science based solutions

NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH
Division of the National Health Laboratory Service

CORE TEAM

(NICD Centre for Vaccines and Immunology)

South African experiences with wastewater-based epidemiology for SARS-CoV-2

1. The beginnings of the wastewater environmental surveillance– from polio to SARS-CoV-2
2. Methods – how we perform and report qualitative, quantitative and genomic testing from wastewater
3. Overview of the dashboard
4. Next steps - what is the future of wastewater based epidemiology in South Africa?

The beginnings – from polio to SARS-CoV-2 environmental surveillance

June 2017
NICD environmental surveillance for polio

April/May 2020
ES for SARS-CoV-2 concept published

January 2021
SA-MRC publishes proof of concept

March 2021
NICD starts testing 17 plants for SARS-CoV-2

March 2021
WRC Phase 1

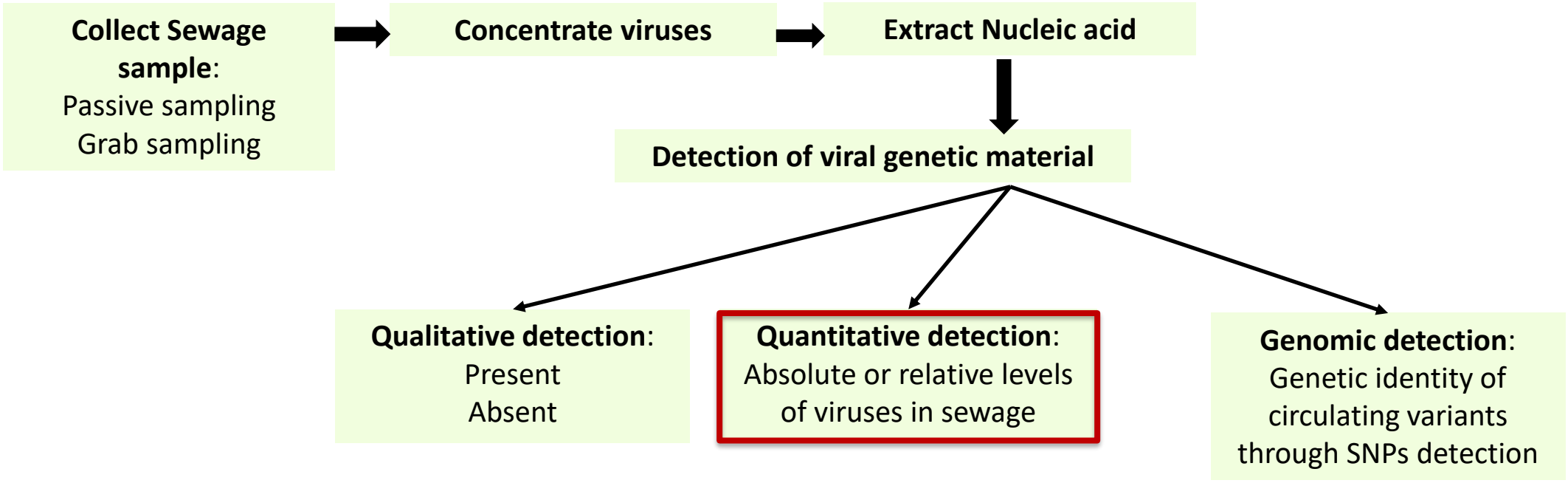
August 2021
WRC Phase 2

November 2021
Gates grant

May 2022
WRC/GIZ Phase 3

SACCESS	Number of sites		
	Phase 1	**Phase 2**	**Phase 3**
NICD	17	17	17
Waterlab	9	28	9
Praecautio/Greenhill	3	13	4
CSIR	3	8	5
NIOH	3	7	4
Lumegen	6	13	7
DUT	-	4	2
SA-MRC (BRIP)	3	-	-
SA-MRC (TB)	3	6	-
TOTAL	48	96	48

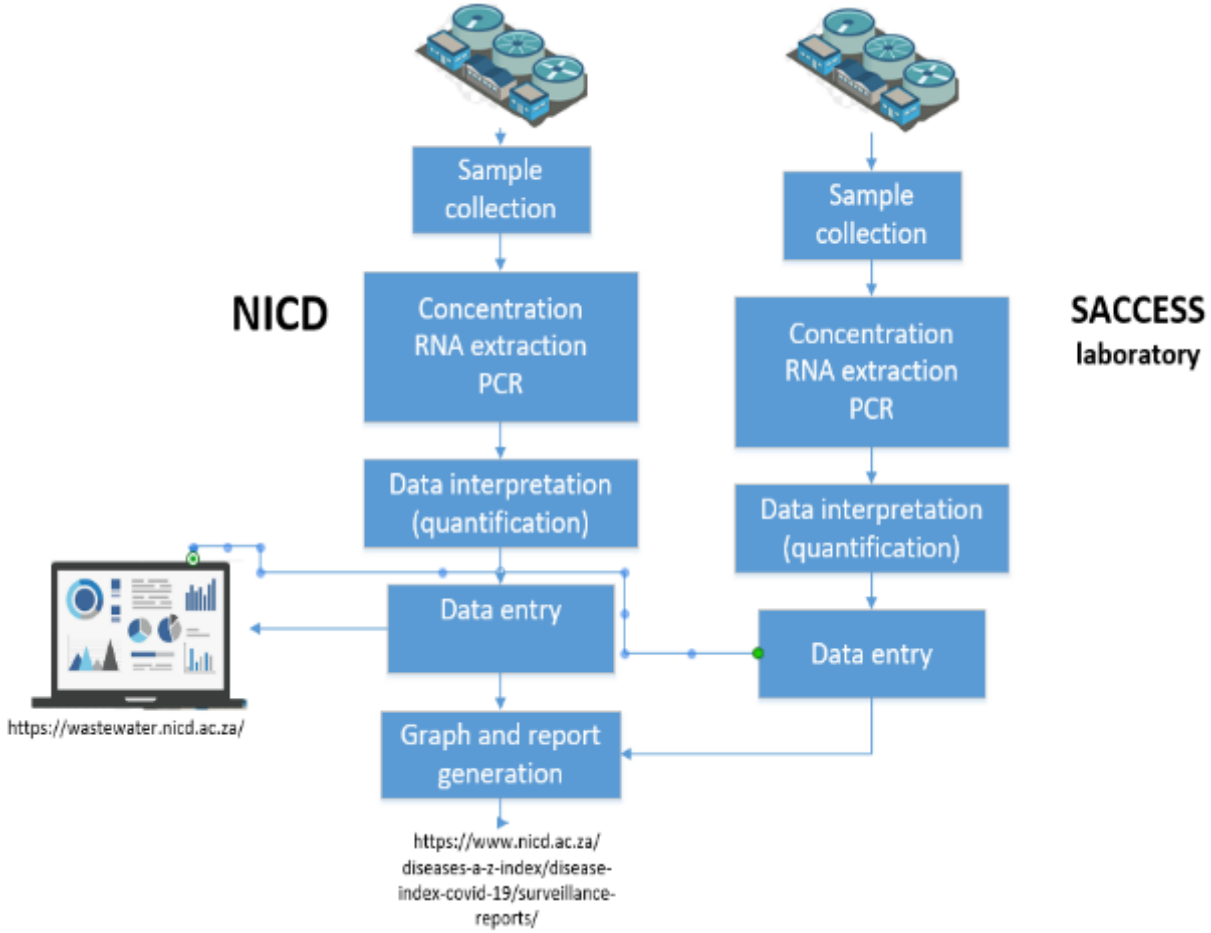
Methods – what we do



Methods – what we do

- Data management
  - Partner labs and NICD each responsible for sample collection, data collation of results from their plants
  - Partners submit results to NICD weekly each Thursday
  - NICD team manually enters results, generates graphs

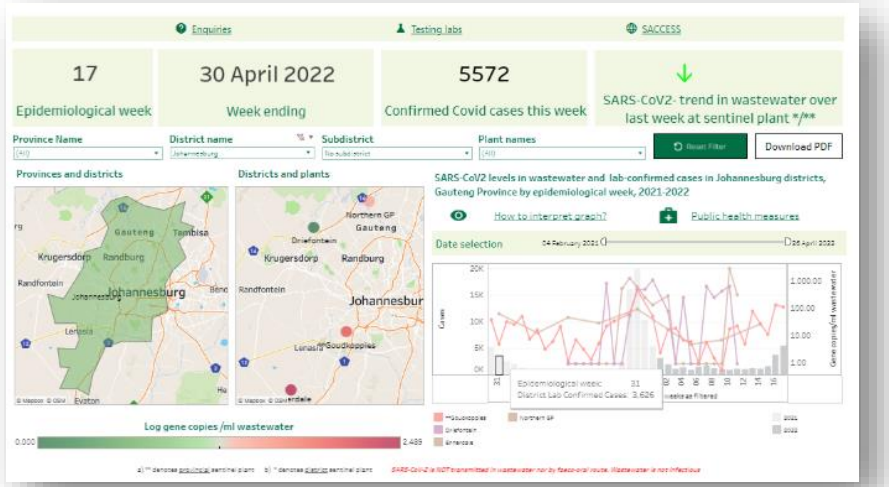
- Reporting
  - Spreadsheet and graphs distributed to partners on Friday including SACCESS network, NICD focal lead on IMT (Dr Michelle Groome)
  - Weekly reports on NICD website
  - Updating of NICD/SACCESS Dashboard



Methods – what we do

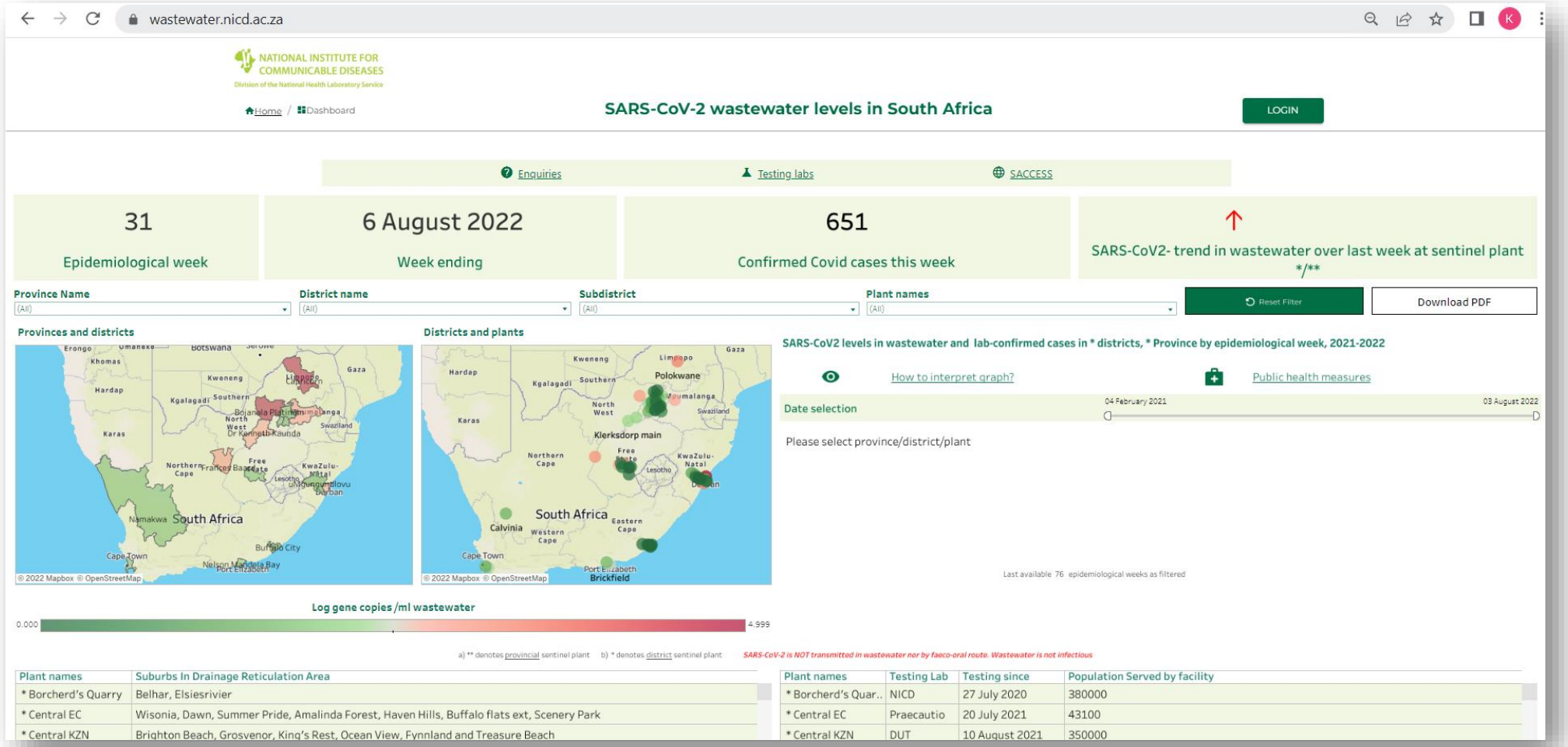
- Communications
  - Reports on NICD website
    - https://www.nicd.ac.za/diseases-a-z-index/disease-index-covid-19/surveillance-reports/weekly-reports/wastewater-based-epidemiology-for-sars-cov-2-in-south-africa/

- Dashboard
  - https://wastewater.nicd.ac.za/



- Infographics on social media

Results- dashboard overview



- https://wastewater.nicd.ac.za/

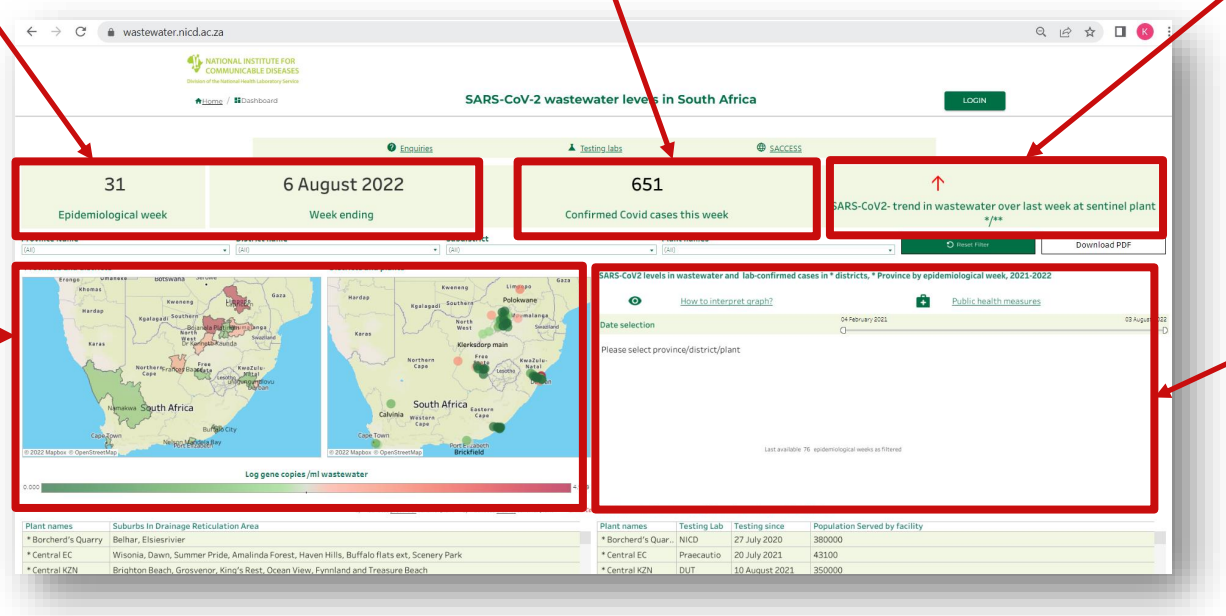
Results- dashboard overview

Indicators
- Epi week and date of last update to the dashboard

Indicator – number of clinical cases
- Number of reported SARS-CoV-2 cases in that epi-week (default=national, but changes to fit selected plants)

Indicator – trend of SARS-CoV-2 in wastewater
- Direction of most recent change in wastewater levels at the sentinel plant for the selected area
- Default=national, but changes to fit selected plant

Maps:
- Left – districts
- Right – locations of wastewater treatment works (WWTW)
- Colour intensity = SARS-CoV-2 levels
  - Green=lower
  - Red=higher

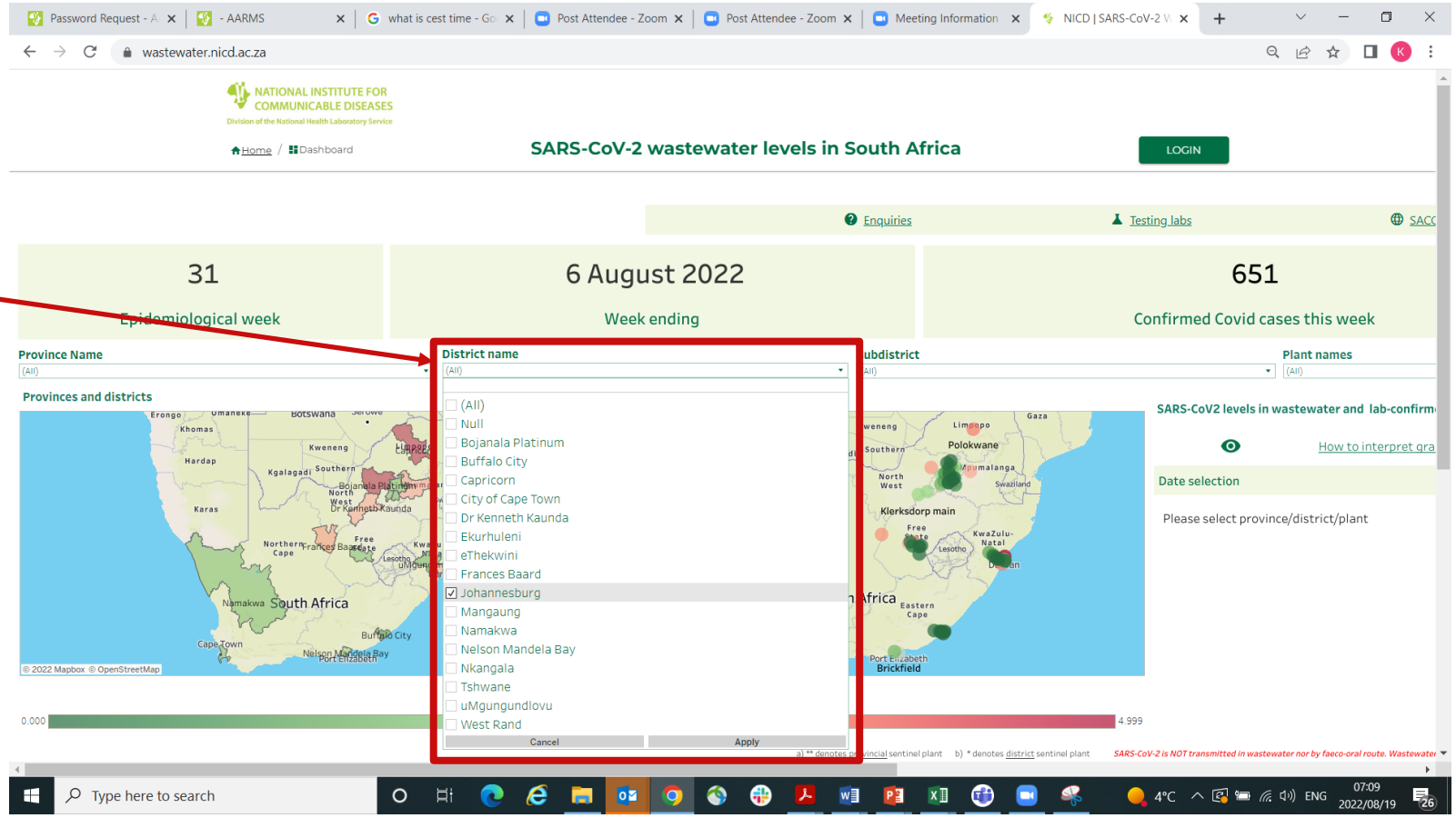


Space for graphs
- Empty until selection is made from dropdowns

- https://wastewater.nicd.ac.za/

Results- dashboard overview

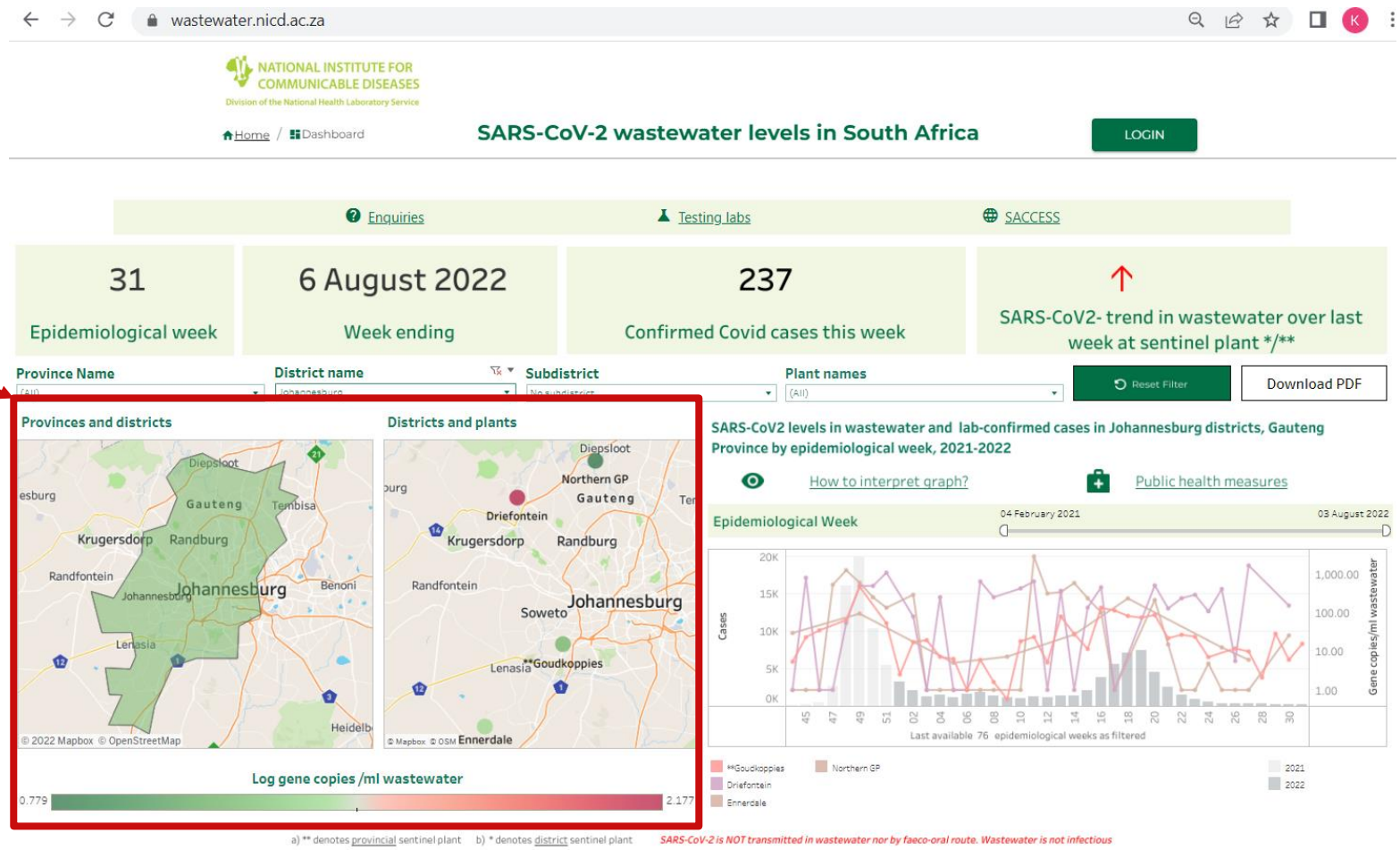
- Click on District dropdown
  - Select a province or district from drop-down
  - Click ‘apply’



https://wastewater.nicd.ac.za/

Results- dashboard overview

- On clicking ‘apply’
  - The maps will reconfigure to show the area of interest
  - The graph will populate with data from all the WWTW in the area



- https://wastewater.nicd.ac.za/

Results- dashboard overview

- On clicking ‘apply’
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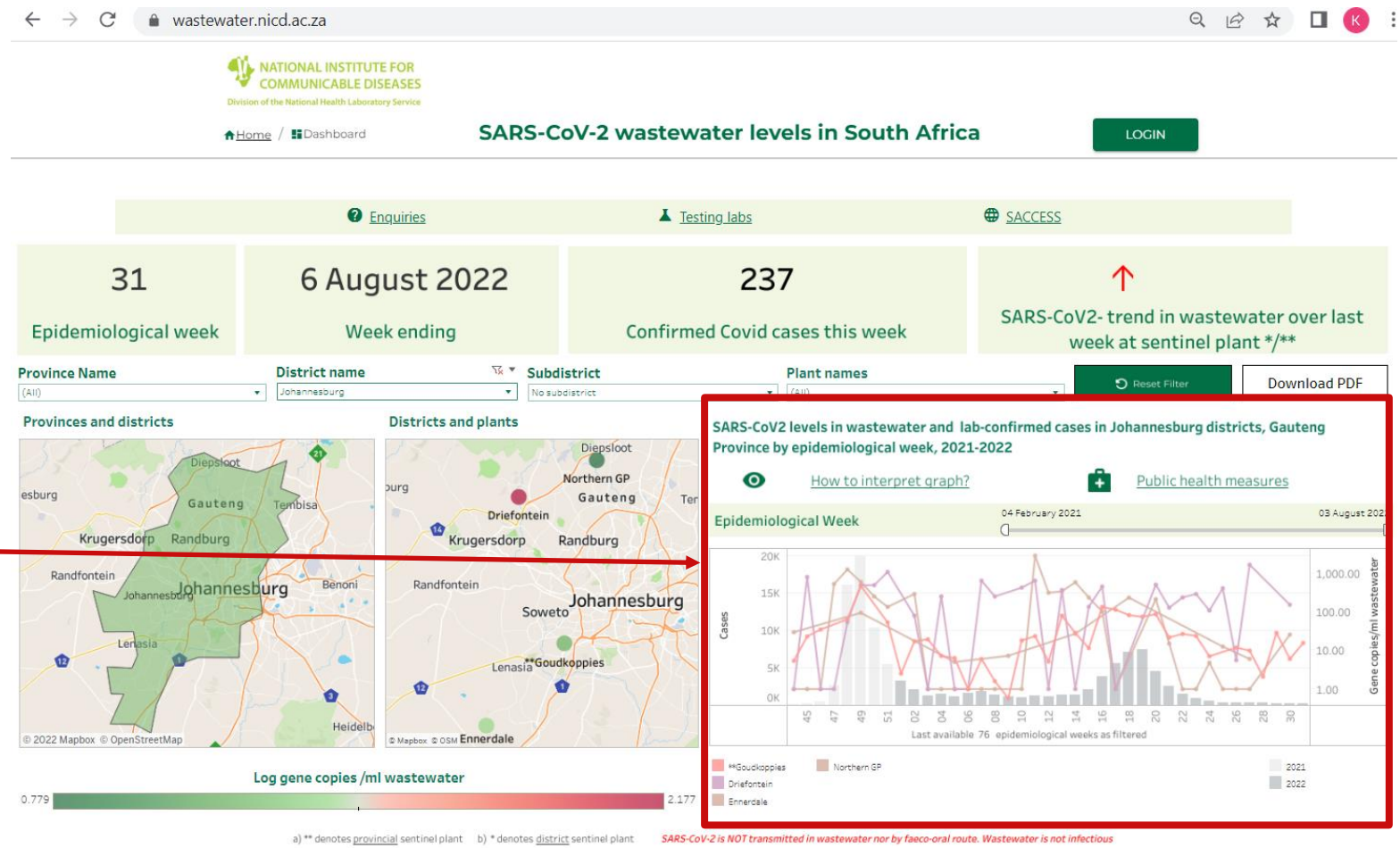
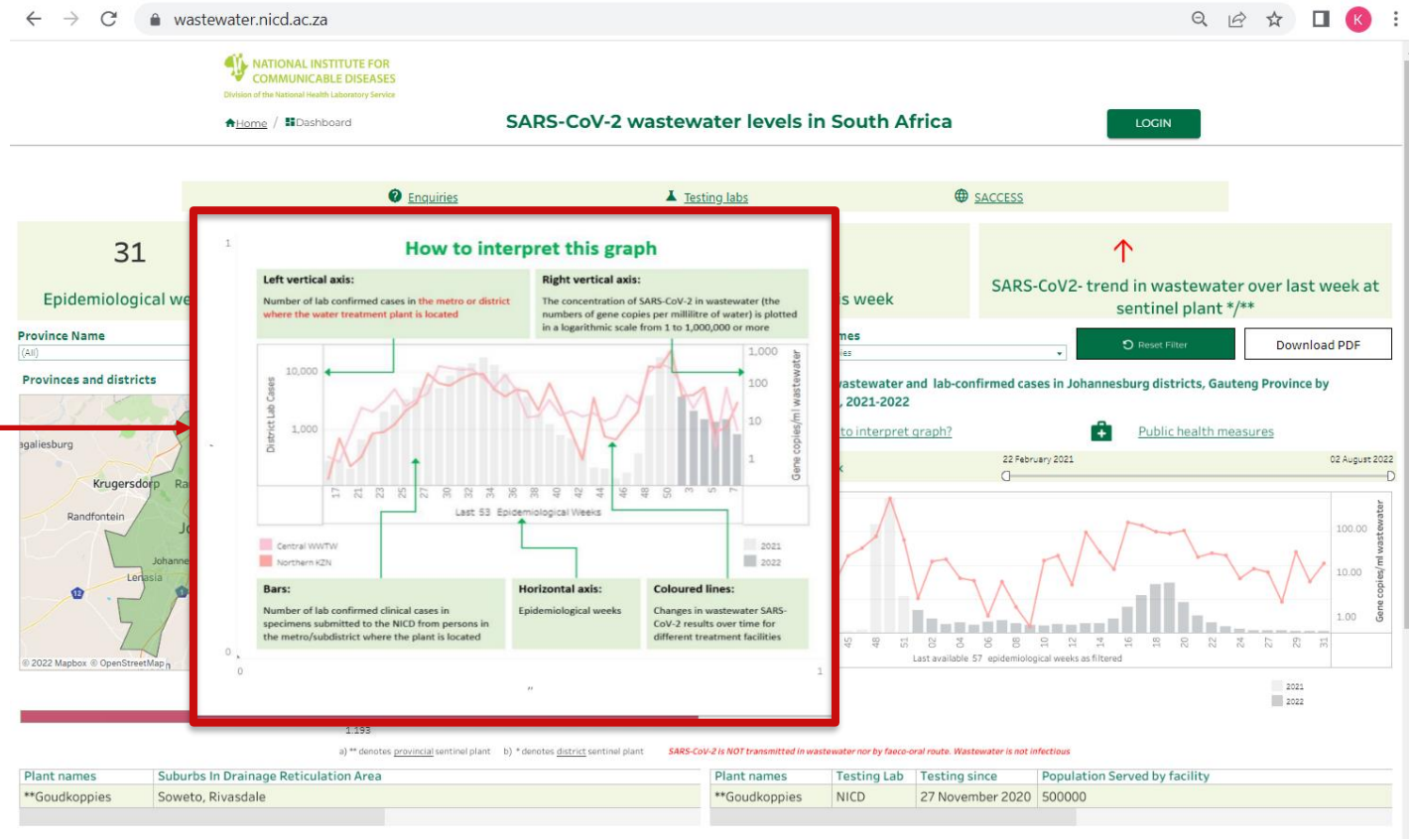


- https://wastewater.nicd.ac.za/

Results- dashboard overview

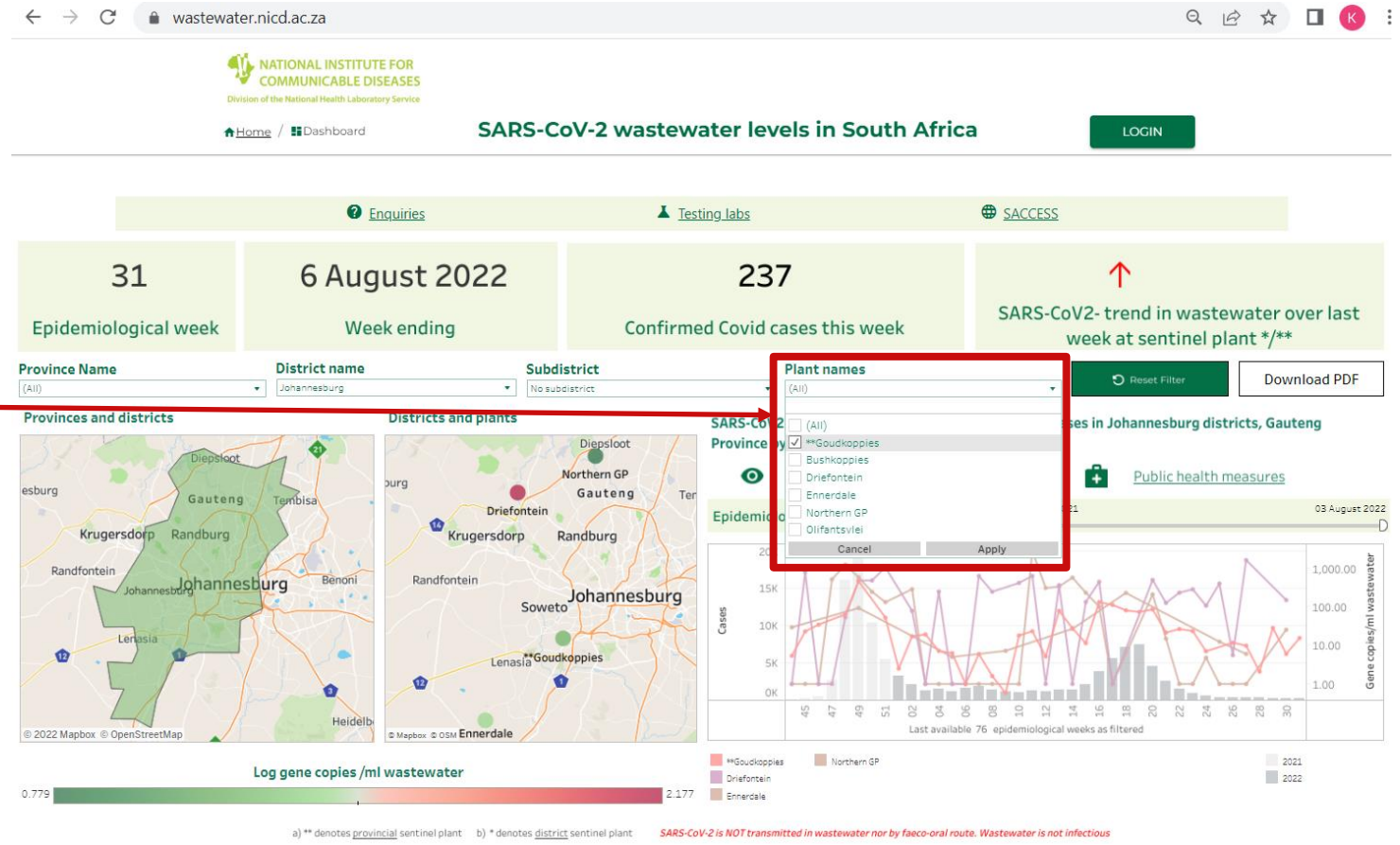
- An infographic on how to interpret the graph can be seen by clicking on the text ‘How to interpret the graph’



- https://wastewater.nicd.ac.za/

Results- dashboard overview

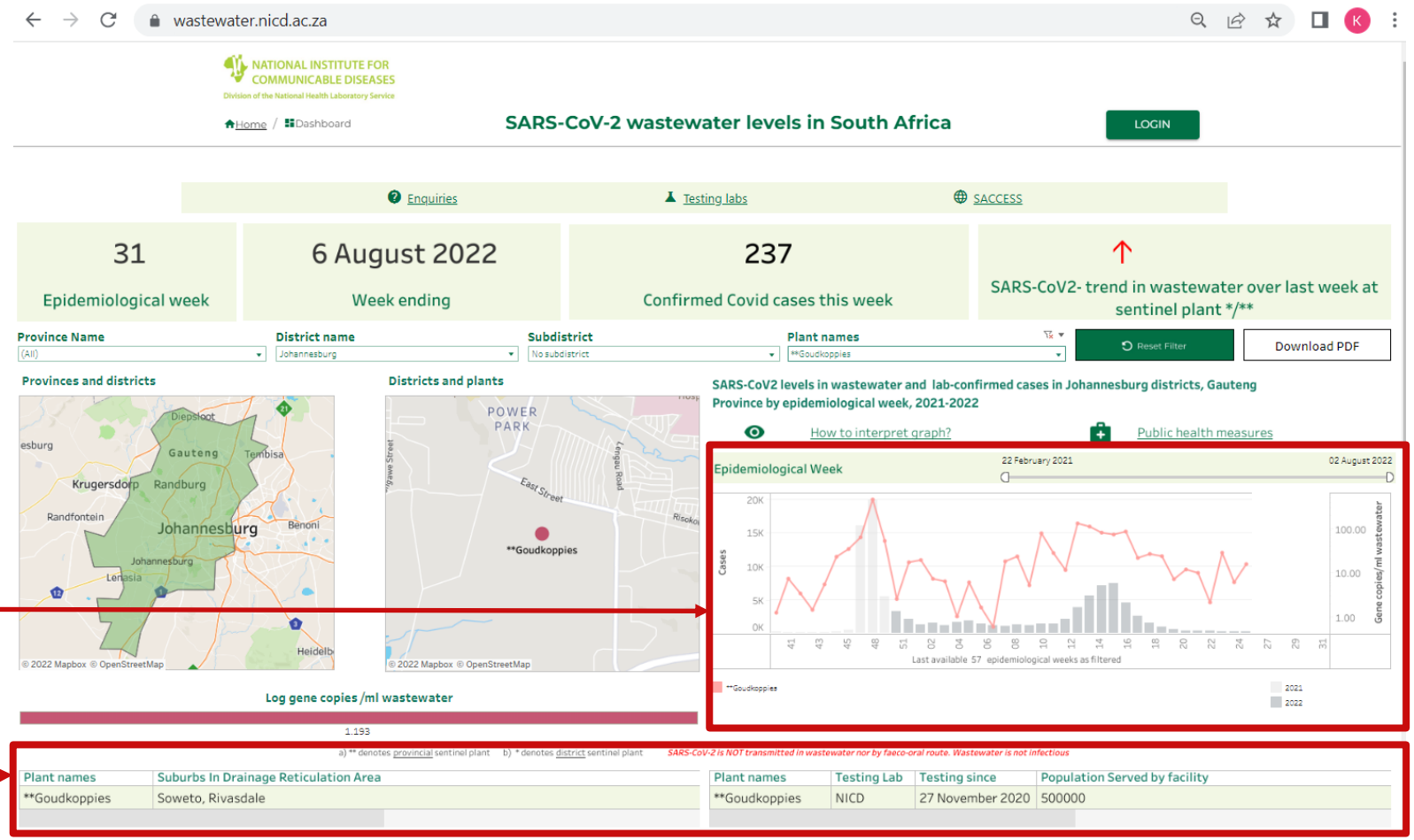
- To show data from only a single plant, (or more than one plant of interest)
  - Click on the ‘plant name’ drop down
  - Select the plant name of interest
  - Click ‘Apply’



- https://wastewater.nicd.ac.za/

Results- dashboard overview

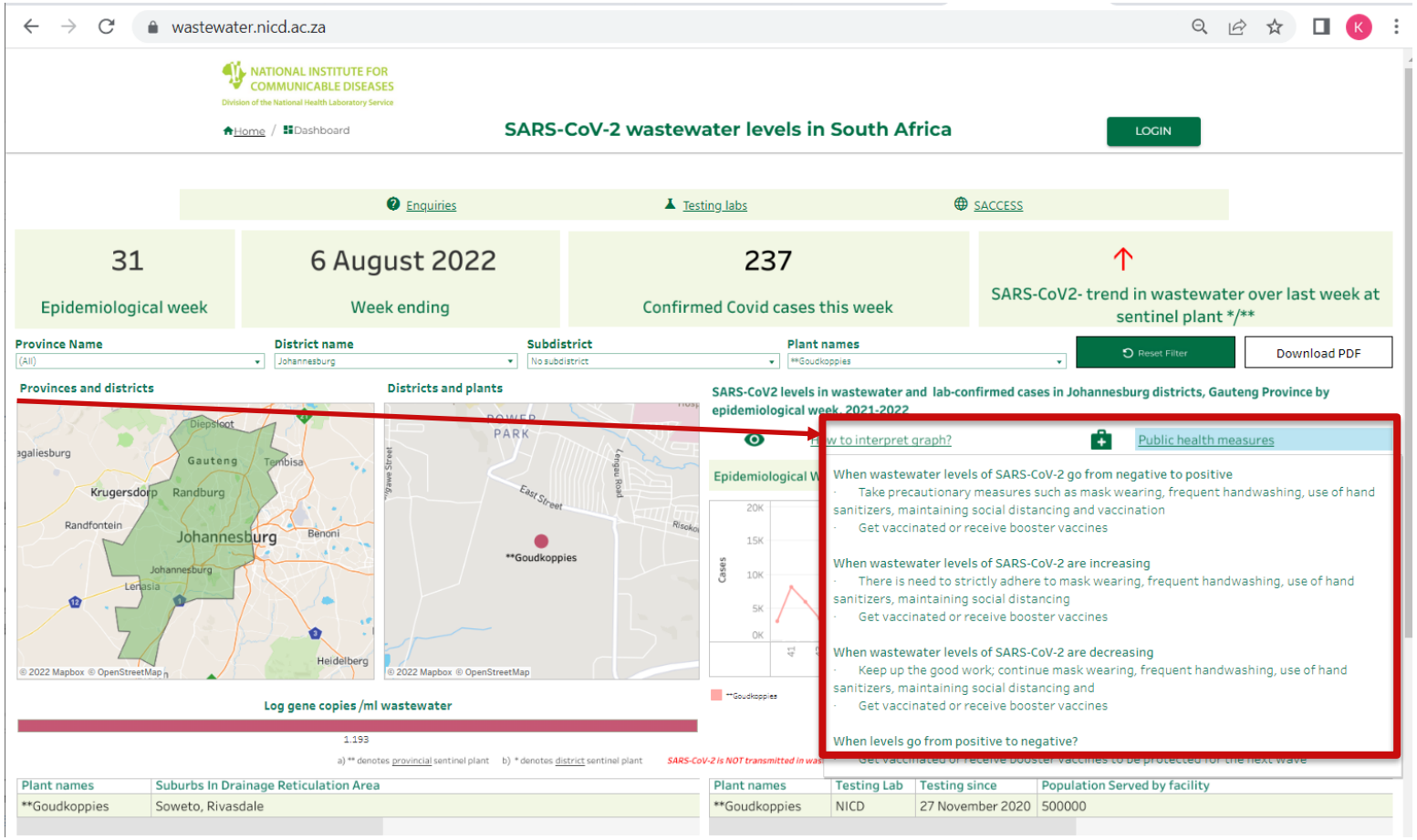
- To show data from only a single plant, (or more than one plant of interest)
  - Click on the ‘plant name’ drop down
  - Select the plant name of interest
  - Click ‘Apply’
  - The graph will populate with wastewater levels from only that plant
  - The plant details will be shown in table below



- https://wastewater.nicd.ac.za/

Results- dashboard overview

- A description of what public health actions to take depending on the wastewater levels can be seen by clicking on the text ‘public health measures



- https://wastewater.nicd.ac.za/

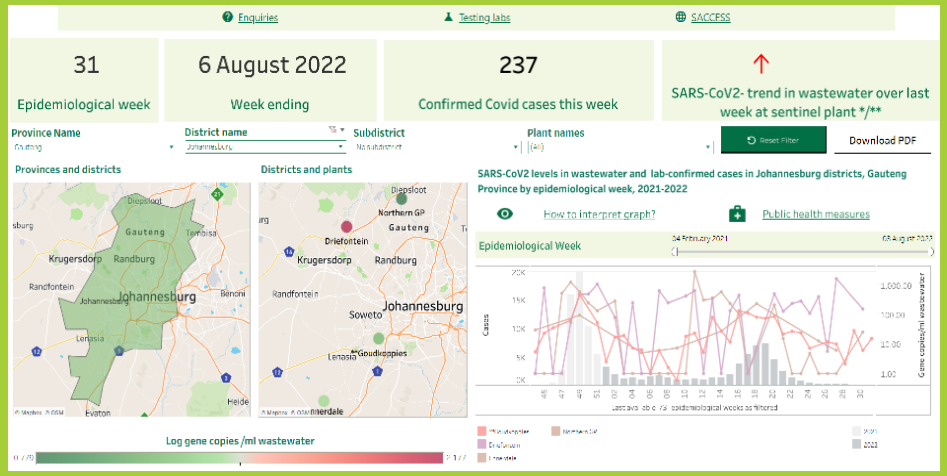
Next steps for the dashboard

- Understand how the portal is used by the public and policy makers
- Development of a data-input portal
  - To support real time uploading of data
- Refinement of public facing dashboard to support accessibility and ease of understanding
  - Feedback indicates double axis graphs are difficult to understand
  - Drop-down menus and how to use them are not immediately apparent
  - Significance of levels of SARS-CoV-2 are not easily apparent
- Inclusion of genomic results

THANK YOU

Weekly wastewater surveillance reports are published on the NICD website.
https://www.nicd.ac.za/diseases-a-z-index/disease-index-covid-19/surveillance-reports/

Check out the burden of SARS-CoV-2 in wastewater in your area at
https://wastewater.nicd.ac.za/



sustainable sanitation alliance

GIZ country examples

Natalie Schmitz (GIZ)

sustainable sanitation alliance

Wastewater Surveillance in LMCs

- Lack of capacity at different sector levels
- Lack of validated and harmonised procedures
- Sampling of non-sewered systems
- Difficulties in the communication between sectors
- (Sustainable) financing

➡Insufficient knowledge for an effective and implementable application of wastewater-based epidemiology (for pandemic prevention and containment or other public health decisions) in developing countries.

Thus, experience and knowledge on approaches for wastewater-based epidemiology (procedures, coordination, finance, etc.) needs to be processed and assessed their potential applications as well as risks

Role of the WASH-Sector + SuSanA

- Joint collaboration with the health sector to advise in regard to:
  - Sampling procedure and ensuring sampling quality
  - Cooperation with the Water Utilities
  - Sampling spots (especially with non-sewered systems)

- Moderated global sector exchange with peer-to-peer formats
- Feedback on how to deal with the 80%, that are not connected to a sewage system. What does it mean for the significance of the sampling, if it only used sewage systems.
- Piloting measures in countries for best practice

sustainable sanitation alliance

Albania

- Project Name: “Customer and Performance Oriented Drinking Water and Sanitation Services” (CPWS) GIZ Albania
- Duration: September 2016 – May 2023
- Funds for WW Monitoring : Approx 300.000 Euro commissioned by Federal Ministry for Economic Cooperation and Development (BMZ). In 2021 approx. 100.000 from IPA21 (Covid-19 funds)

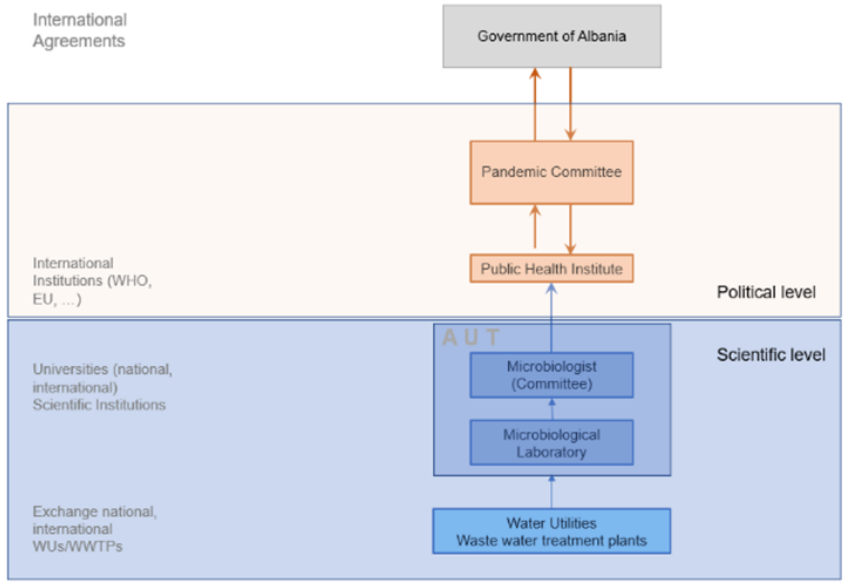
Key Results:

- Micro/molecular biological laboratory with specifications for wastewater analysis established
- Cooperation with Ministry of Health and Agricultural University established
- Cooperation between regional Institutions

Next steps:

- National cross-sectoral crisis response team for pandemic preparedness in line with national guidelines
- Support University in fund raising for operation and maintenance
- Stronger integration of the national health sector in EU and WHO activities and protocols

Cooperations



Jordan

Project Name(s): "Decentralised integrated Sludge Management (DISM) and Capacity Development in Wastewater Management (CWWM) " GIZ Jordan
Duration: 2015/2017- 2020

- The Royal Scientific Society investigated and prepared a technical report "Testing of SARS-CoV-2 in Wastewater and Sludge in Selected Wastewater Treatment Plants in Jordan" in July 2020.
- USAID, among other things, provided the virology laboratory of the water authority with equipment and material

Future Goal(s):

- Implementation of a (sensor-based) wastewater monitoring and control system for pandemic prevention and AMR monitoring
- Strengthen cooperation of the water sector with the health sector
- Sustainable finance of a wastewater monitoring system
- Improvement of wastewater monitoring (for different uses)

sustainable sanitation alliance

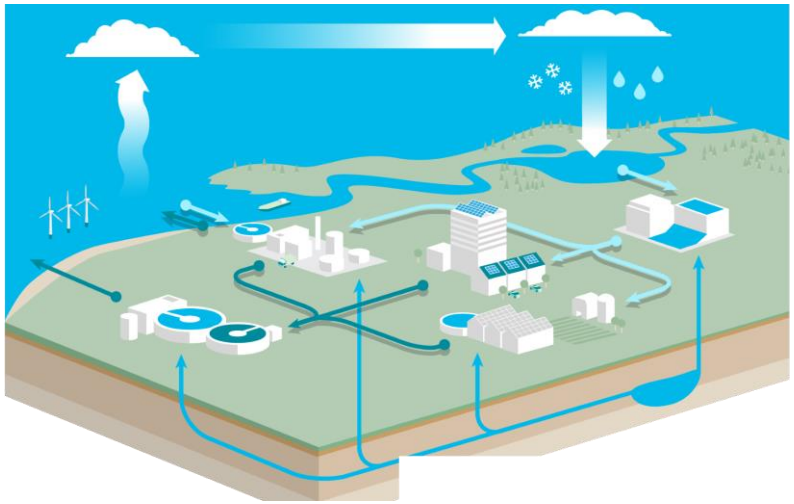
KWR- Water Research Institute

Knowledge Management

Maria Ferreira (KWR)

KWR- Water Research Institute

- Bridging Science to Pratice



Health

Emerging contaminants
Safe innovation and the water sector
Biological activity
Microbial safety

WHO Collaborating Centre on Water Quality and Health

watershare®

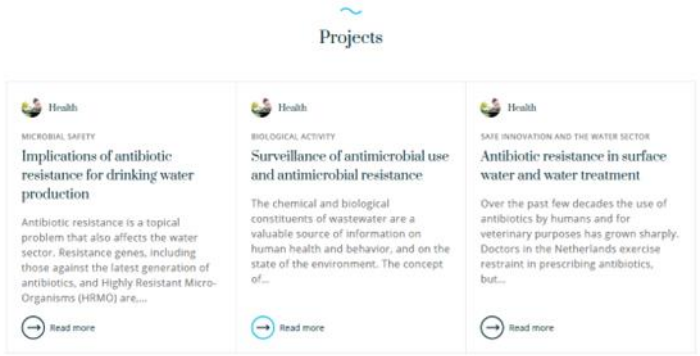
KWR- Sewage Surveillance & Antibiotic Resistant Micro.

Available online at www.sciencedirect.com
ScienceDirect
Current Opinion in Environmental Science & Health

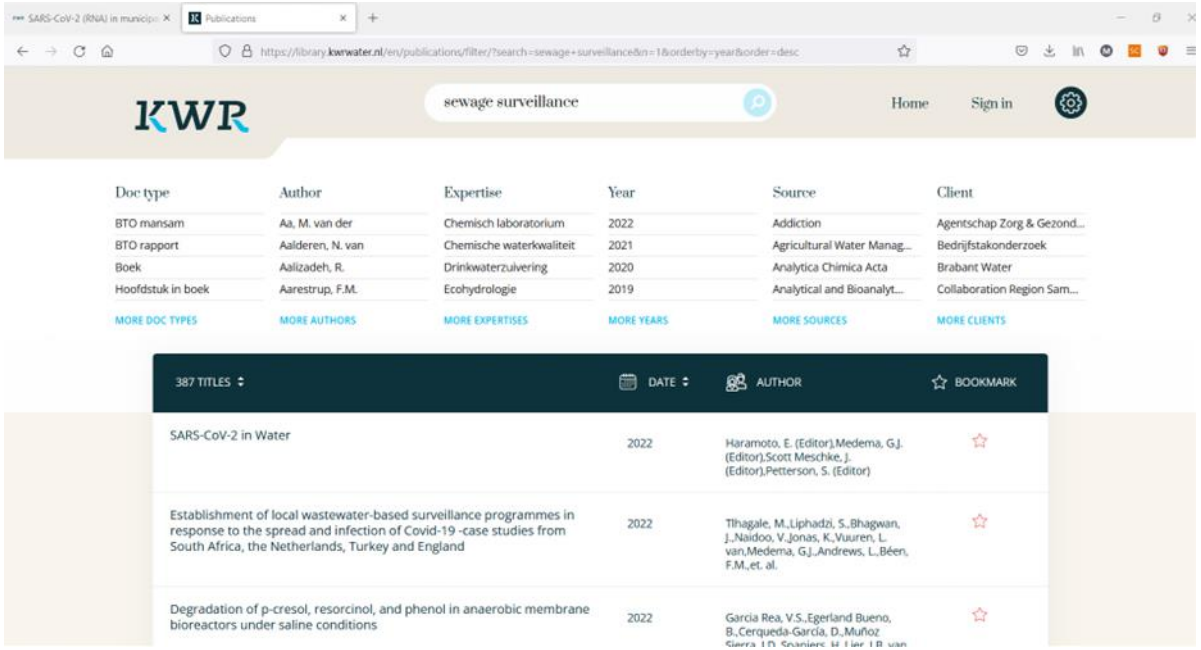
Implementation of environmental surveillance for SARS-CoV-2 virus to support public health decisions: Opportunities and challenges

Gertjan Medema[1,2,3], Frederic Been[1], Leo Heijnen[1] and Susan Petterson[4,5]

Oct 2020



https://www.kwrwater.nl/en



https://library.kwrwater.nl/en

KWR/Watershare & SuSanA

- Examples of collaboration
  - World Water Forum in Dakar/Senegal 2022
    - Watershare and SuSanA as co-covening partners Supporting the organizers-Task Force Covid 19, World Water Council

sustainable sanitation alliance

KWR/Watershare & SuSanA

- Further:

  - Systematically scan KWR and Watershare newletters (SuSanA);
  - Share relevant knowledge in SuSanA forum (KWR);
  - Highlight meaningful news with posts on SuSanA forum and social media (KWR/Watershare and SuSanA);
  - Co-organizing or co-convening of public events, such as the organized by the “covid-19 task force” on the World Water Council (KWR/Watershare and SuSanA).

We are open to suggestions! Maria.Lousada.Ferreira@KWRwater.nl

sustainable sanitation alliance

Decision support tools for informed choices

Nitya Jacob (SuSanA India Chapter) &
Dorothee Spuhler (Eawag)

SuSanA India Chapter

Nitya Jacob, Chapter Coordinator

Overview

- Started in 2016
- Is supported by a consortium of 6 WASH organizations in India
- 20 thematic discussions resulting in synthesis documents and policy notes on rural and urban sanitation, institutions, governance, technology, finance and behaviour change
- 12 webinars and five in-person meetings, including one on wastewater-based epidemiology for surveillance of the coronavirus
- About 4000 members

Rural FSM

- Government guidelines for sanitation sustainability explicit about importance of rural FSM
- Multiplicity of agencies and sources of money, but a case of too many cooks…
- Little guidance for implementers or local governments who have to make and manage FS treatment systems

Thematic discussion recommendations

- Any solution for rural FSM must be simple and context specific.
- The sparsely developed and remote rural areas would be best served with on-site or decentralized solutions.
- Converting single pit toilets to double pits, and containment tanks to septic tanks, is the most desirable solution.
- Co-treatment at existing FSTPs and STPs is the next option where feasible but will take a while to materialise. The district administration could formalist these arrangements via MoUs.
- Emptying charges and frequency need to be fixed with financial and technical considerations in mind; they cannot be political decisions.
- Integrated management of FSM and SWM can be planned and executed in most rural areas.
- FSTPs need to be monitored by state pollution control boards and local authorities.

A Decision for rural Faecal Sludge Management

Links

- Thematic discussion:

Faecal Sludge Management in Rural Areas – Building a Decision Tree - Page 4 - SuSanA Forum

Eawag:
Swiss Federal Institute of Aquatic Science and Technology

Informed Sanitation System and Technology Choice:

Selected tools from Eawag and partners

SaniChoice
Informed Sanitation Technology and System Choice for Planning

Dorothee Spuhler

Swiss Federal Institute of Aquatic Science and Technology – Eawag

Technology Choice for City Wide Inclusive Sanitation

Brings a couple of challenges…

#1 Selecting locally appropriate technologies

#2 Entire sanitation systems

#3 Planning for resource recovery

#4 Planning with all stakeholders

Manila Principles for CWIS

Equity

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

Environmental and Public Health

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

Hybrid Technologies

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

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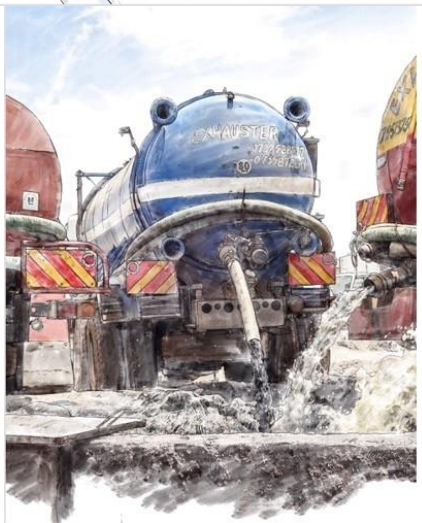


iples for CWIS

Comprehensive Planning

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

Monitoring and Accountability

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

Mix of Business Models

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

eawag aquatic research

Sanitation Planning Challenge #1

Selecting Locally Appropriate Sanitation Technologies

Preconditions:

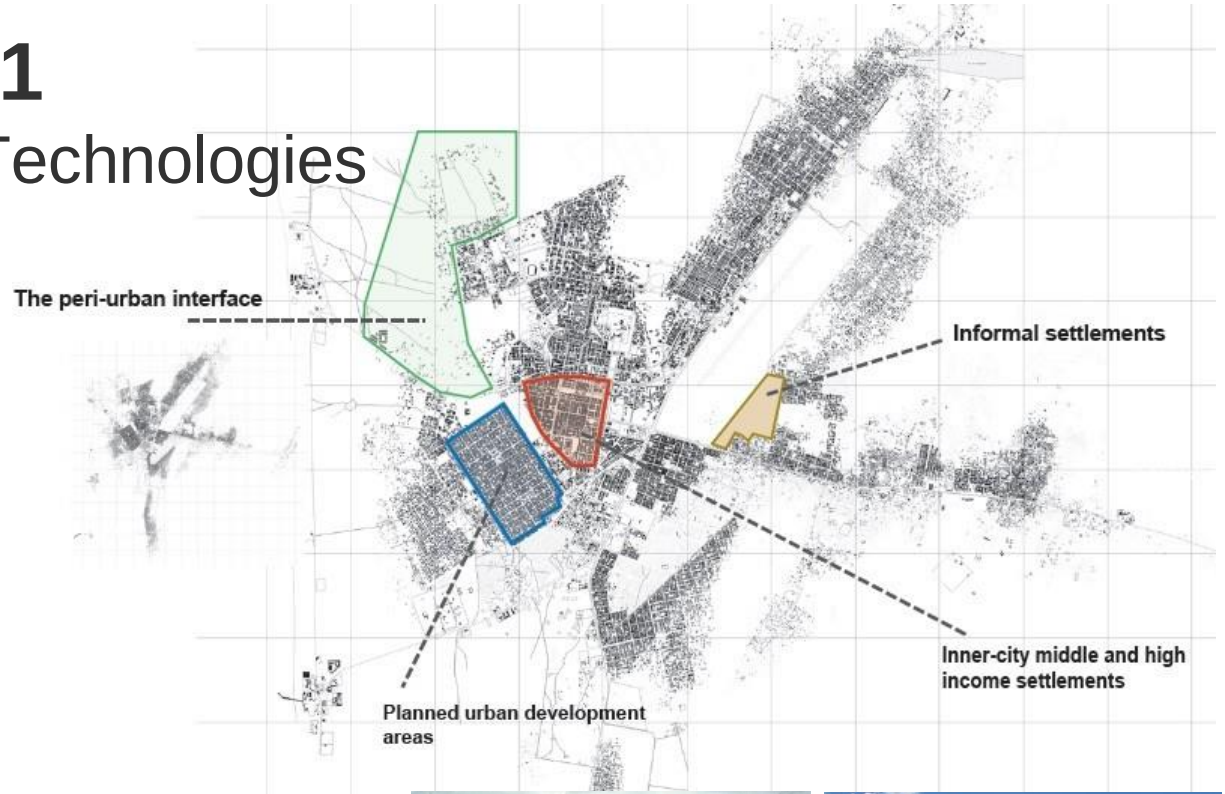
- Existing infrastructure
- Topography and environment

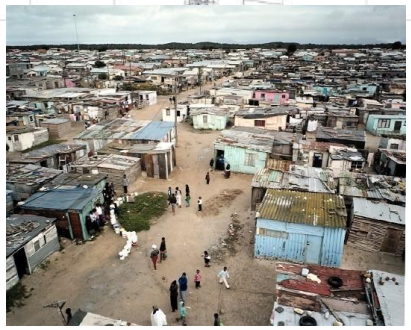
Technology requirements:

- Resource availability (e.g. water, energy)
- Socio-economic and cultural
- Institutional
- Operation and maintenance capacities/skills

Preferences and trade-offs:

- Resource recovery
- Costs
- Etc.



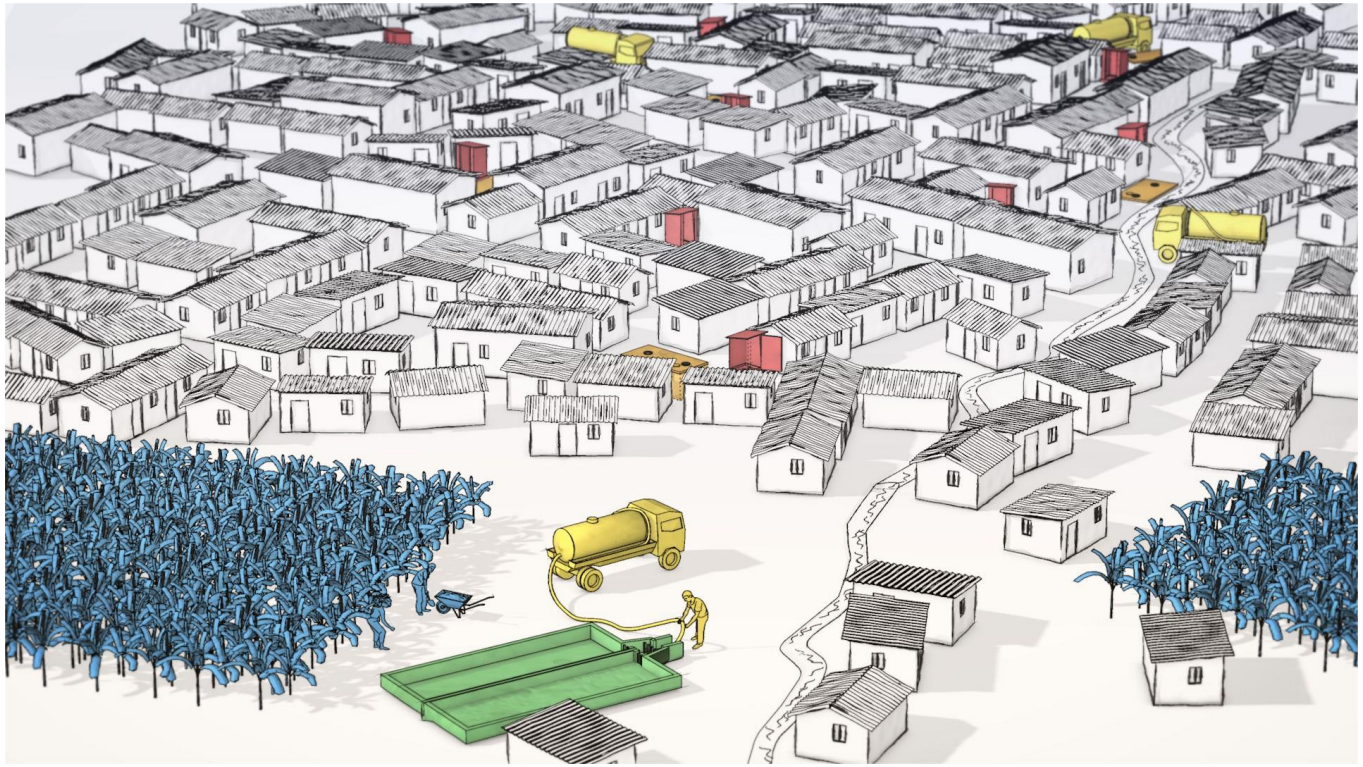


Sanitation Planning Challenge #2: Planning for SDG6…

…requires to plan for the entire sanitation value chain

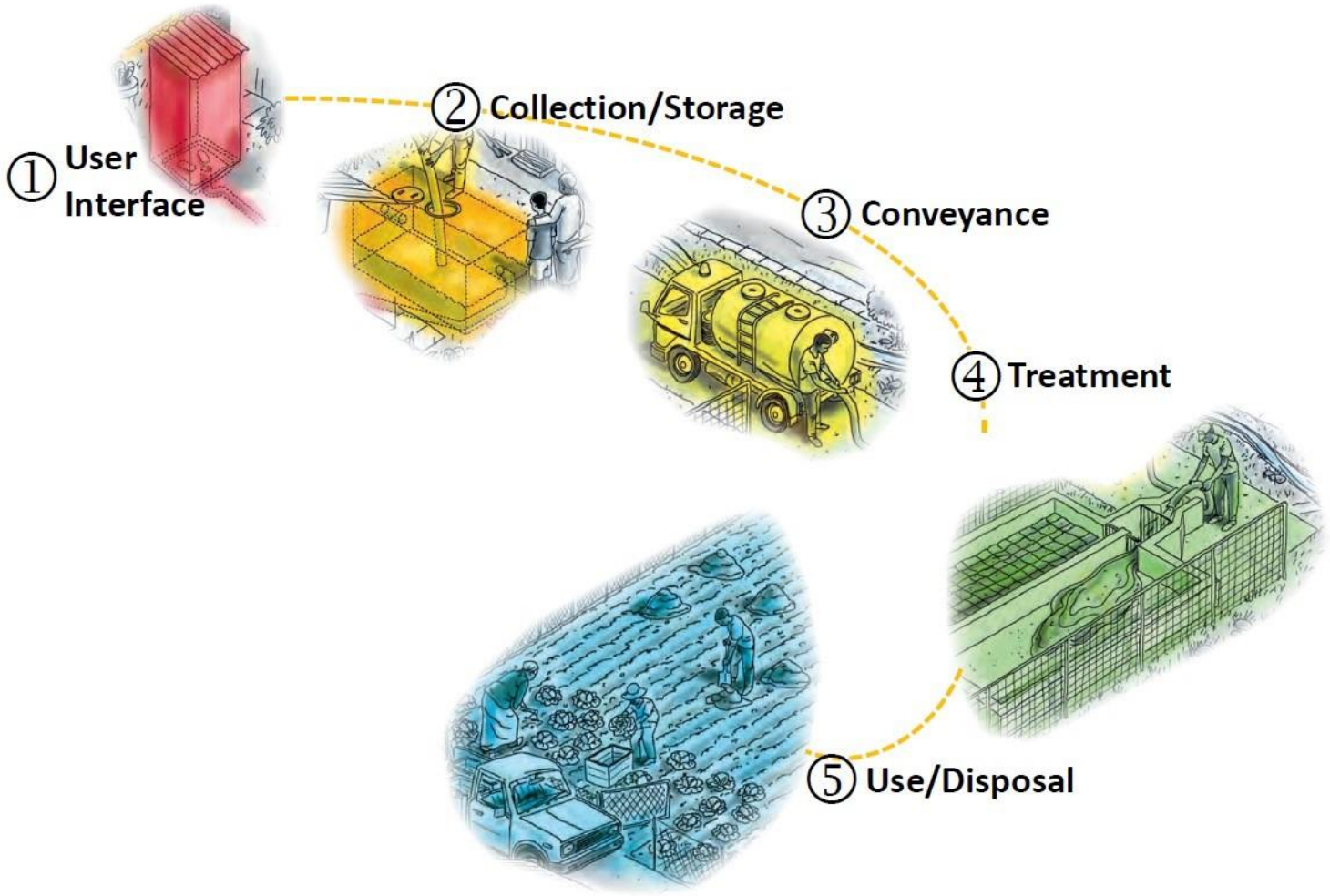
Improved sanitation facilities are those designed to hygienically separate excreta from human contact (SDG 6.2): this means not shared with others, and **safely managed**:

- treated and disposed of in situ,
- stored temporarily, emptied and treated off-site, or
- transported through sewer and treated off-site.



The sanitation system: an entire value chain

A **valid sanitation system** is a logical combination of technologies from the user interface to the final reuse or disposal



Compendium of Sanitation Systems and Technologies

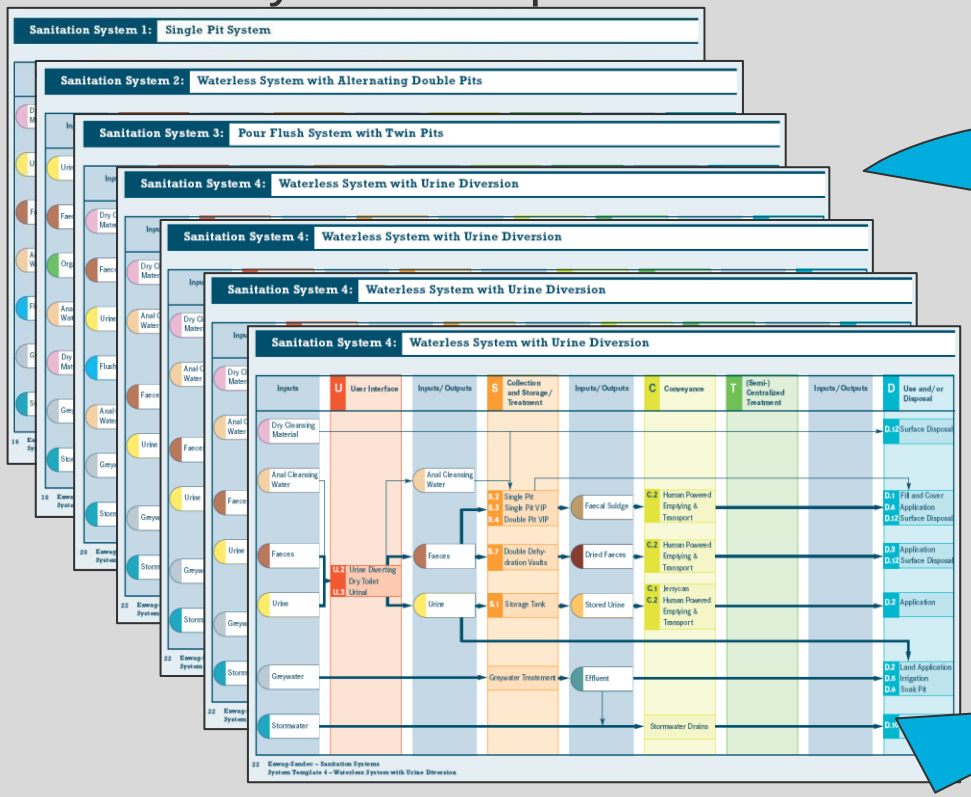
Over 50 practice approved sanitation technologies and 9 system templates

- Comprehensive overview on currently available tec
- Yet compact and easily understandable
- Peer-reviewed descriptions
- Available in many languages

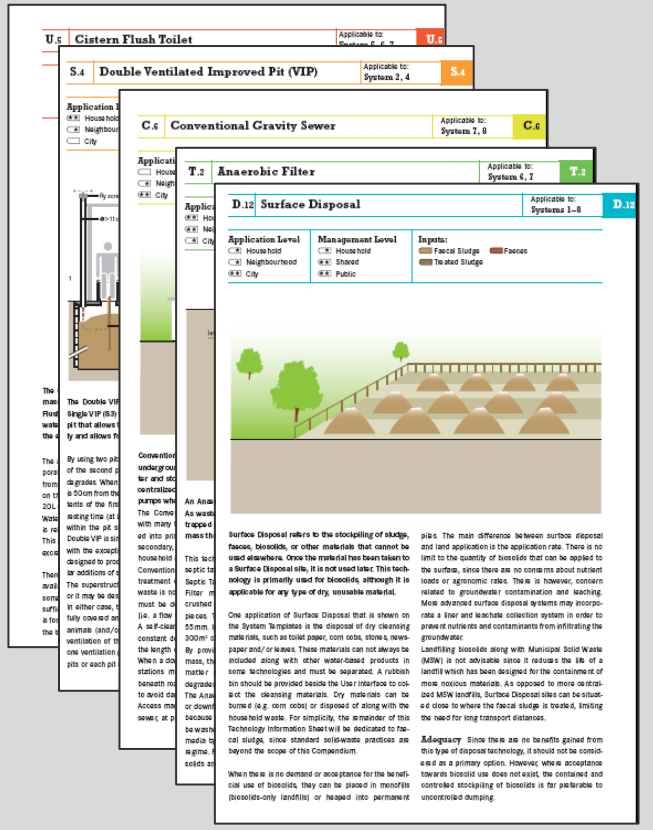
www.sandec.ch/compendium

The Compendium of Sanitation Systems and Technologies

Part I:
Sanitation System Templates



Part II:
Technology Information Sheets



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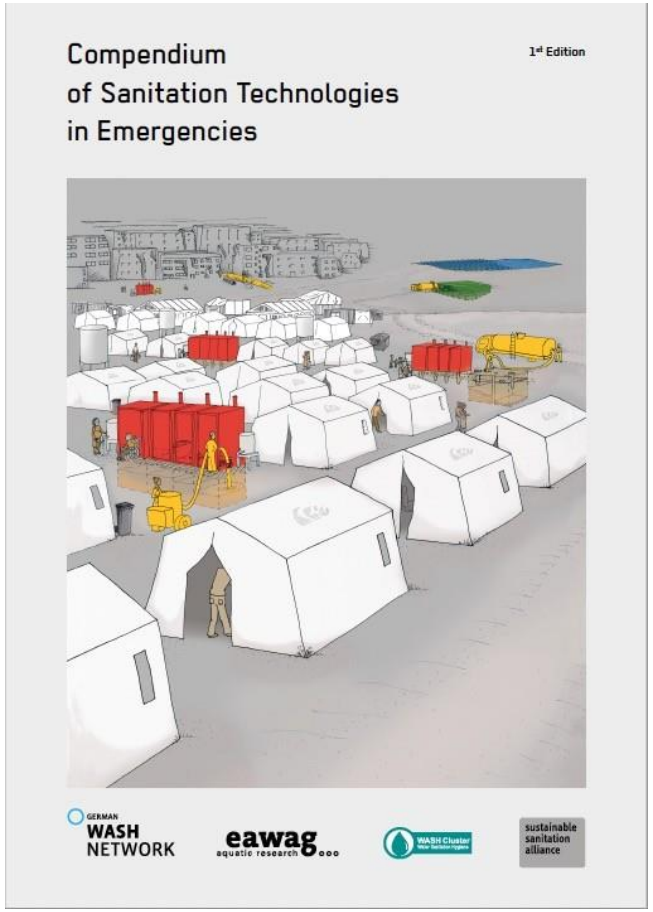
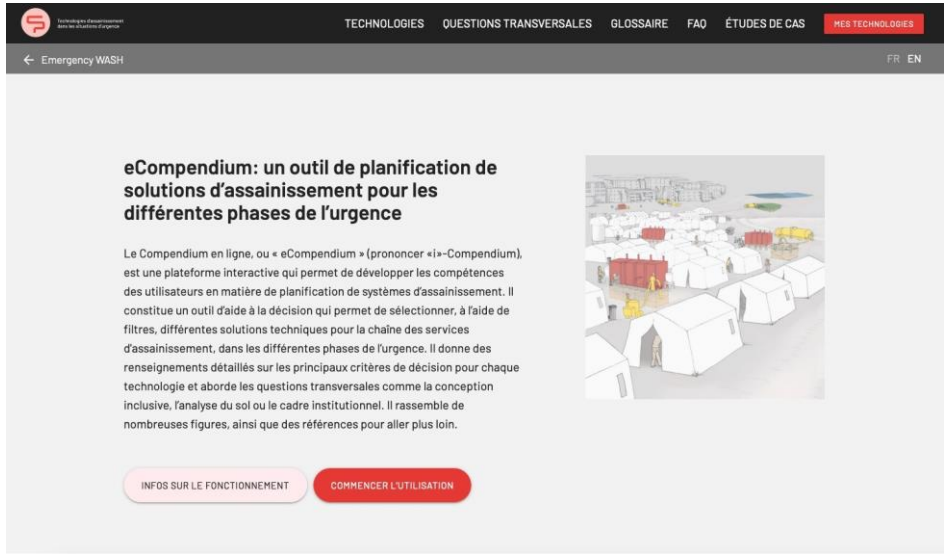
- English
- French
- Spanish
- Arabic
- Russian
- Romanian

Compendium of Sanitation Technologies in Emergencies

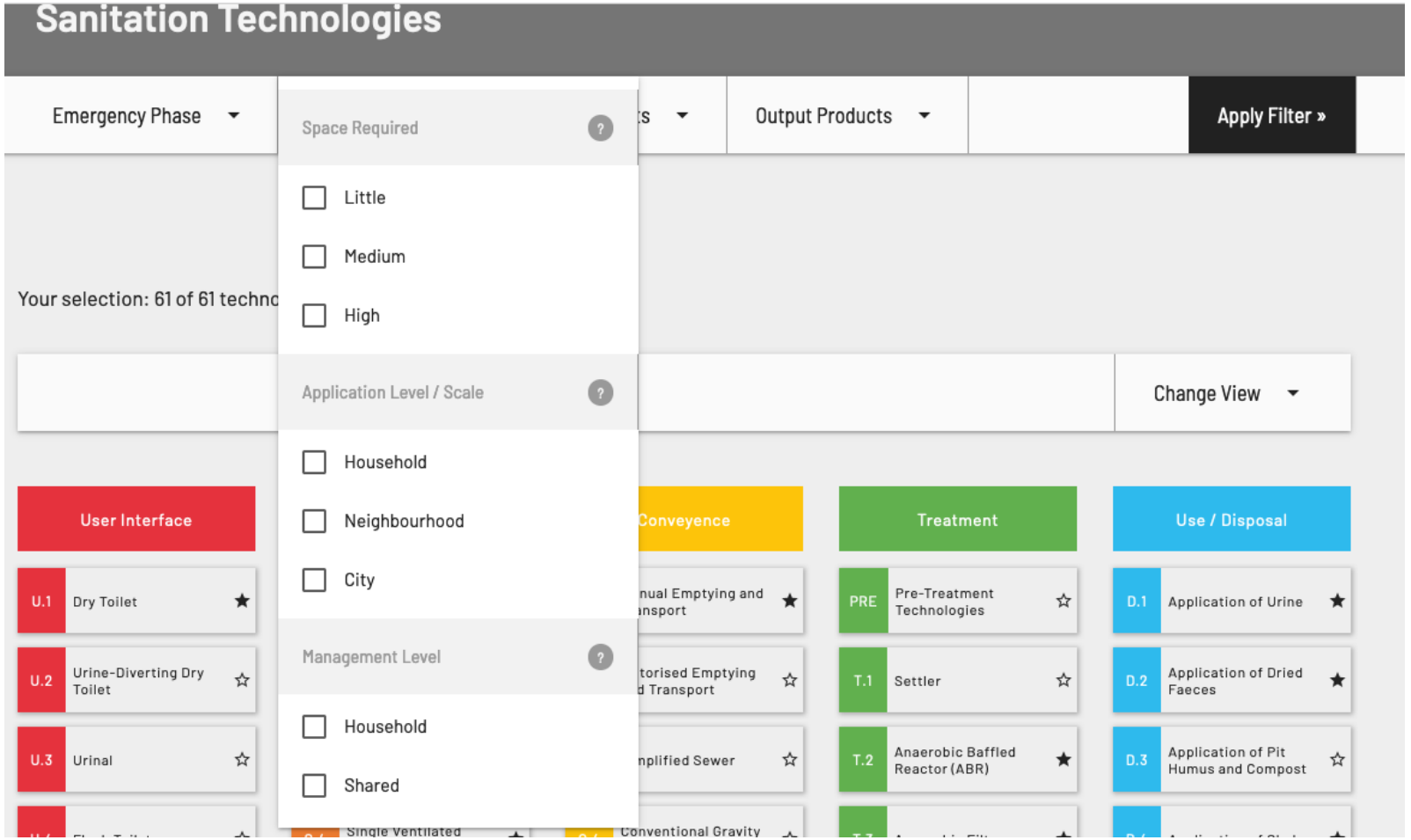




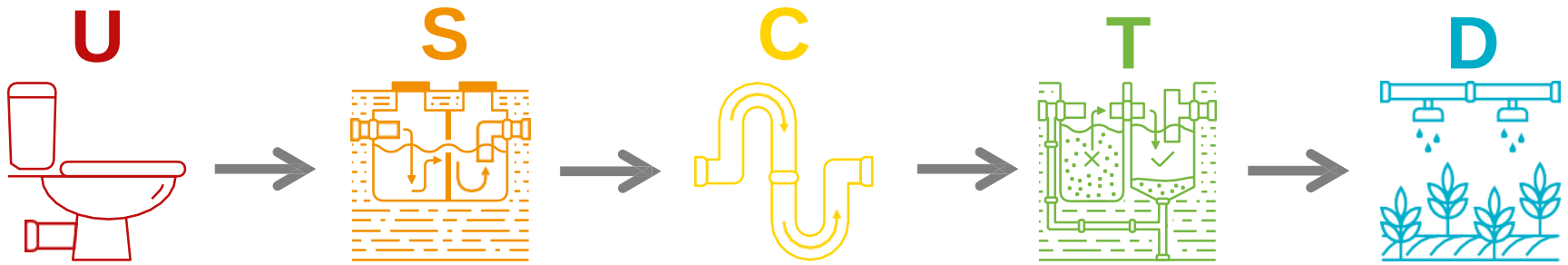
https://www.emersan-compendium.org/en/

Compendium of Sanitation Technologies in Emergencies

Simple Filter



An overwhelming number of options



5 * 5 * 5 * 5 * 5 = 3’125

- Dry toilet
- Urine diverting Dry Toilet
- Urinal
- Pour-flush toilet
- Flush Toilet
- Urine diverting flush toilet
- Etc.

- Single Pit
- Single VIP
- Dehydration vaults
- Septic tank
- Composting chamber
- Anaerobic baffled reactor
- Anaerobic Filter
- Etc.

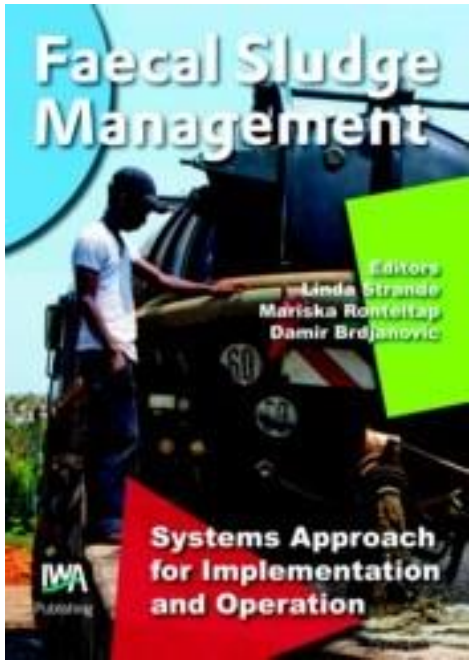
- Human-Powered emptying and transport
- Motorized emptying and transport
- Simplified sewer
- Small-bore sewer
- Conventional gravity sewer
- Etc.

- Anaerobic Baffled Reactor
- Anaerobic Filter
- Waste Stabilisation Ponds
- Activated Sludge
- Constructed Wetland
- Co-composting

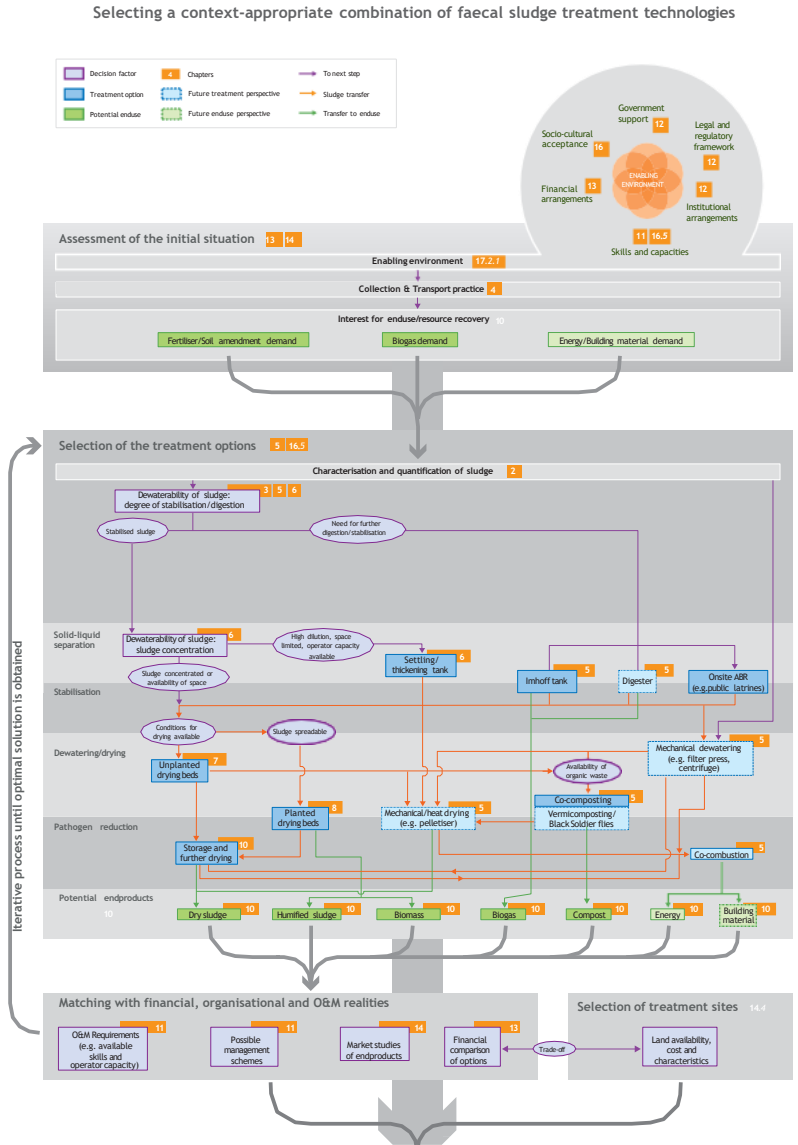
- Application of urine
- Application of stab. sludge
- Irrigation
- Aquaculture
- Soak Pit
- Leach Field
- Land application
- Surface disposal
- Etc.

FSM Decision Tree

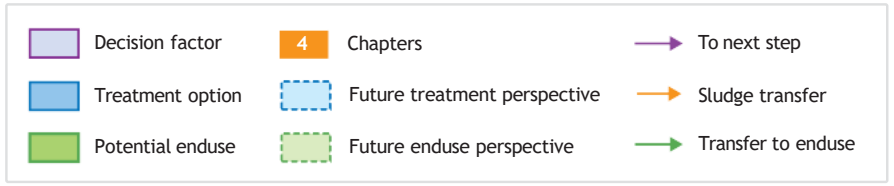
Selecting a context-appropriate combination of faecal sludge treatment technologies



Chapter 17. Planning, Page 383



Selecting a context-appropriate combination of faecal sludge treatment technologies



Assessment of the initial situation 13 14

Enabling environment 17.2.1

Collection & Transport practice 4

Interest for enduse/resource recovery 10

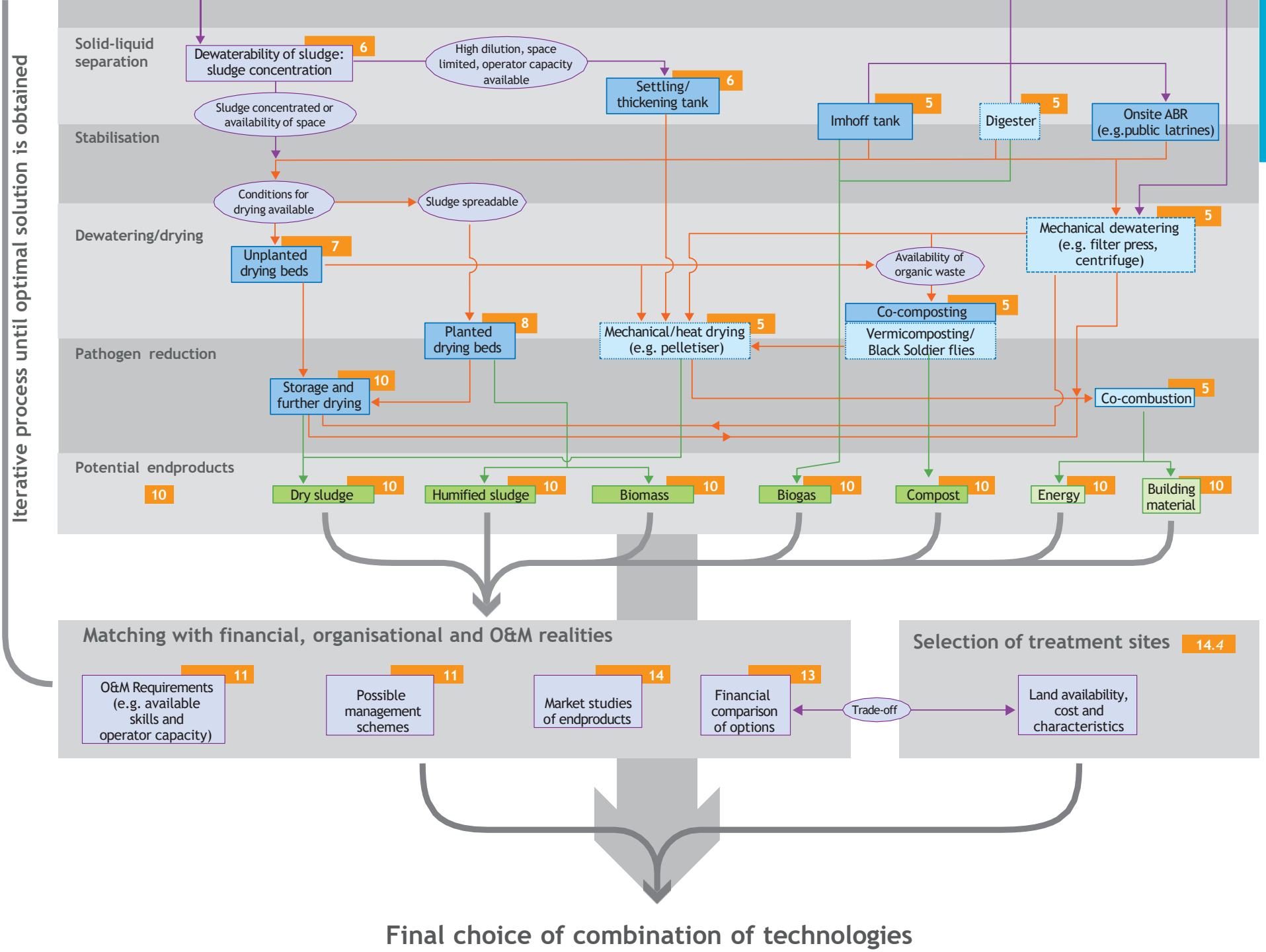
- Fertiliser/Soil amendment demand
- Biogas demand
- Energy/Building material demand

Selection of the treatment options 5 16.5

Characterisation and quantification of sludge 2

Dewaterability of sludge: degree of stabilisation/digestion 3 5 6

- Stabilised sludge
- Need for further digestion/stabilisation



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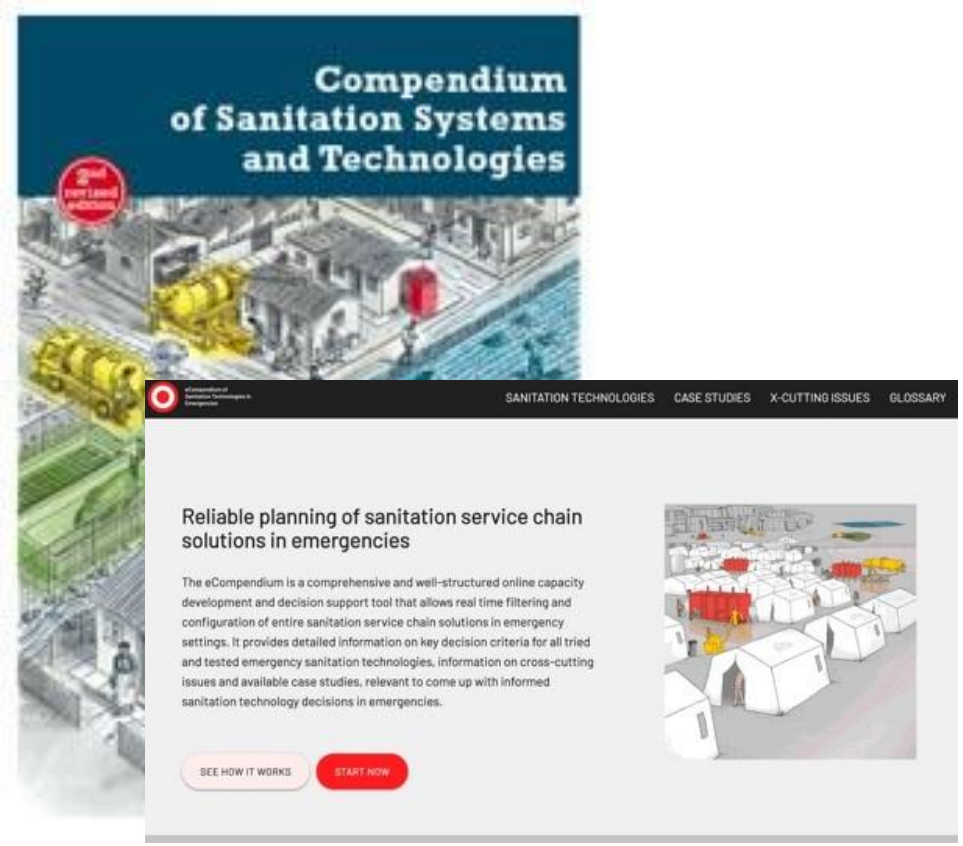
The Compendium of Sanitation Systems and Technologies

Good but not enough



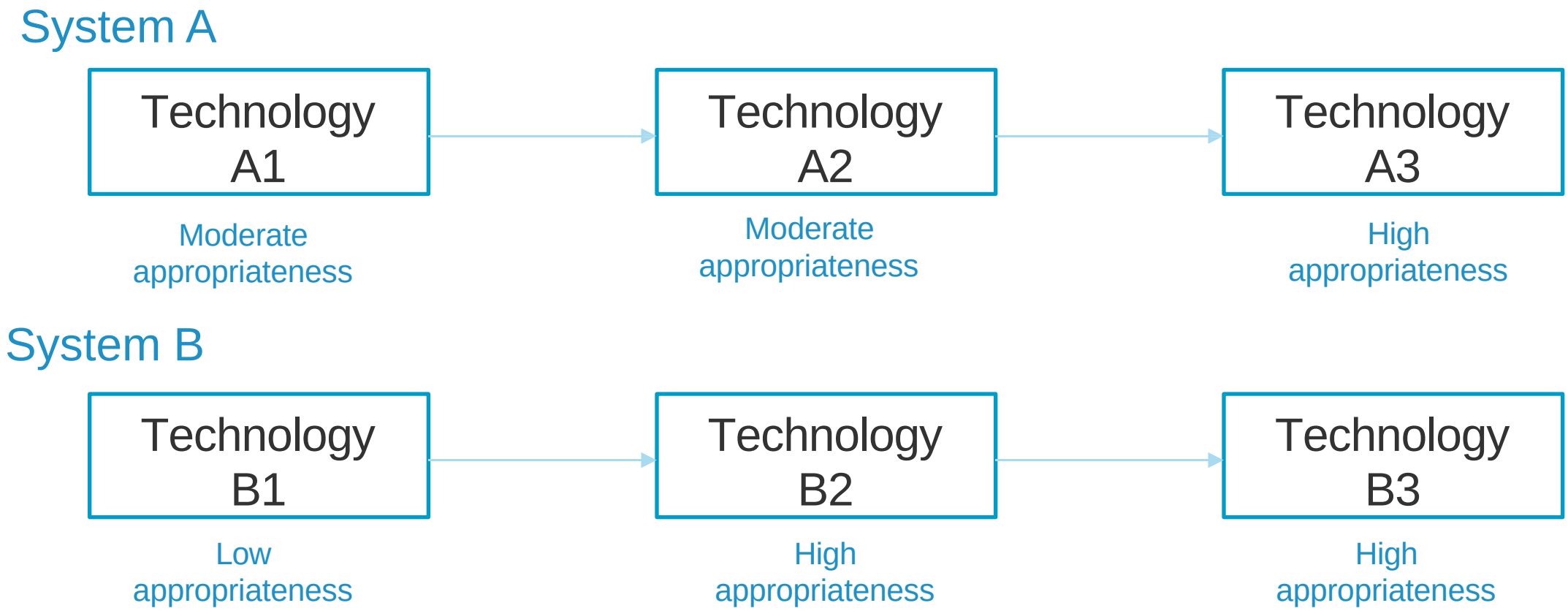
- Comprehensive overview on currently available technologies
- Yet compact and easily understandable
- Peer-reviewed descriptions
- Available in many languages

BUT:

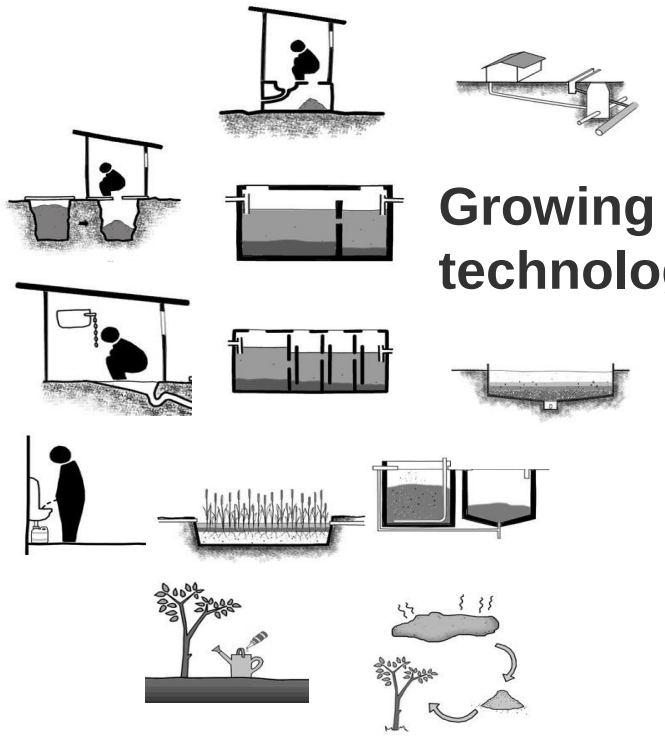
- x no step-by-step guide how to identify appropriate technologies considering uncertainties
- x no systematic guide how to build entire systems
- x No systematic method to deal with trade-offs

There is no single best solutions

Trade-offs require to look on the appropriateness of entire systems!



Complex decision making problem



Growing number of technology options

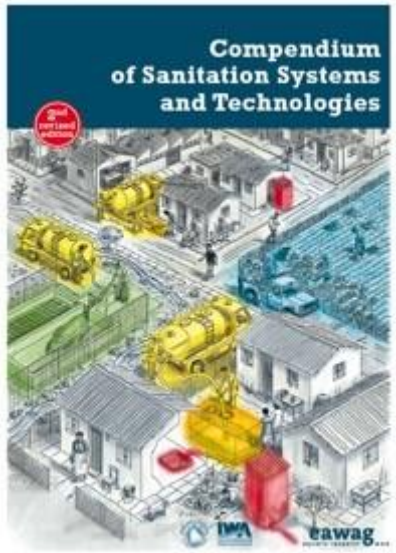
Trade-offs

Multiple criteria

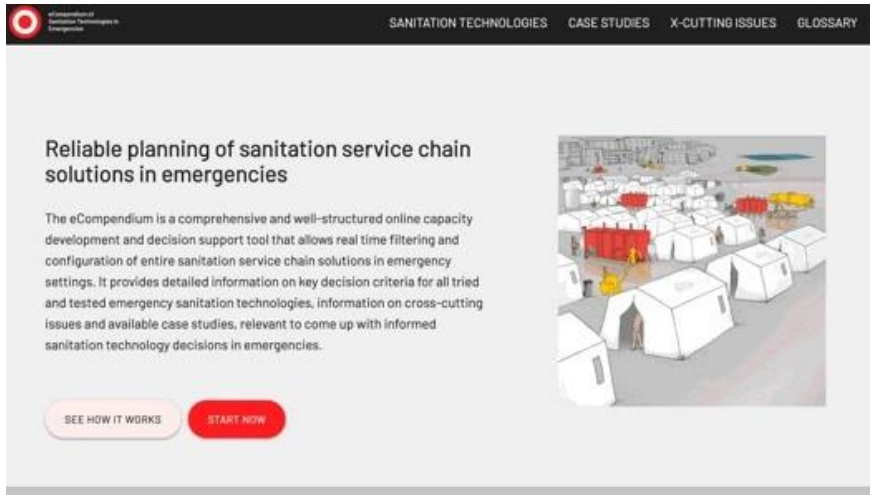
Technology	Environment and resources	Society
Health	Finance	Institutions

Various stakeholder, differing preferences

From the Compendium to SaniChoice



1. Comprehensive overview on technologies and systems
2. Compact and easily understandable
3. Peer-reviewed
4. Many languages



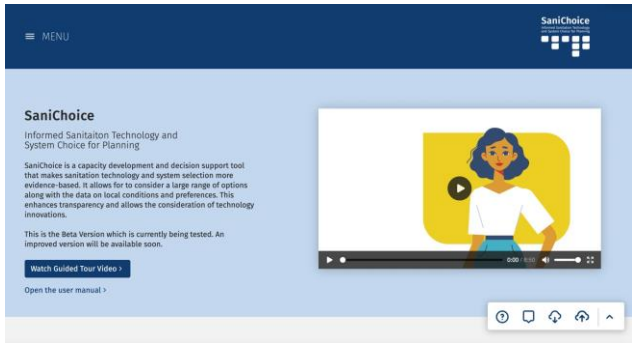
5. Accessible from everywhere
6. Flexible for technology innovations
7. Simple filter function
8. Case studies
9. Expert market place

SaniChoice
Informed Sanitation Technology and System Choice for Planning

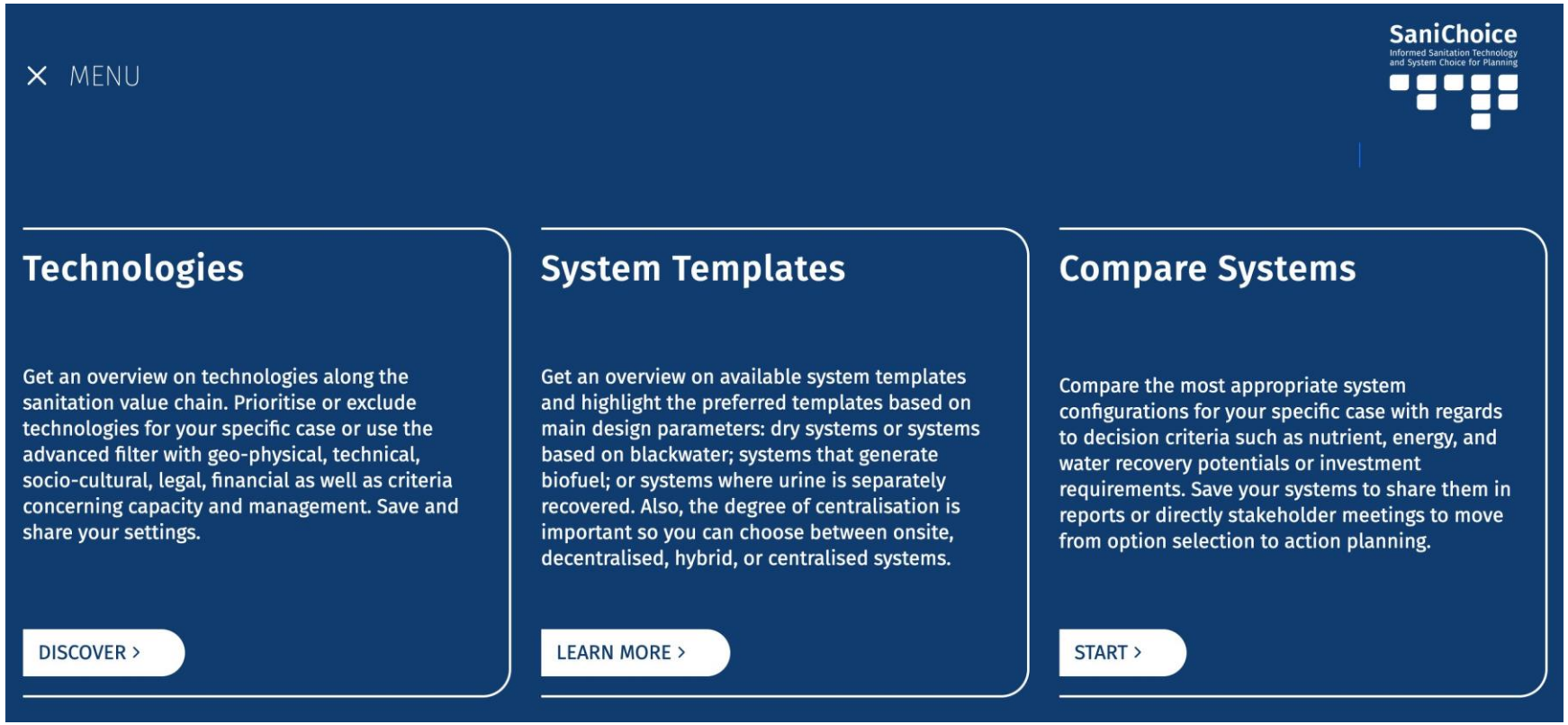
10. Recent technology innovations
11. Advanced filter to select appropriate technologies
12. System builder
13. Resource recovery losses
14. Dashboard to discuss options and trade-offs with stakeholders

SaniChoice

Informed Sanitation Technology and System Choice



www.sanichoice.net



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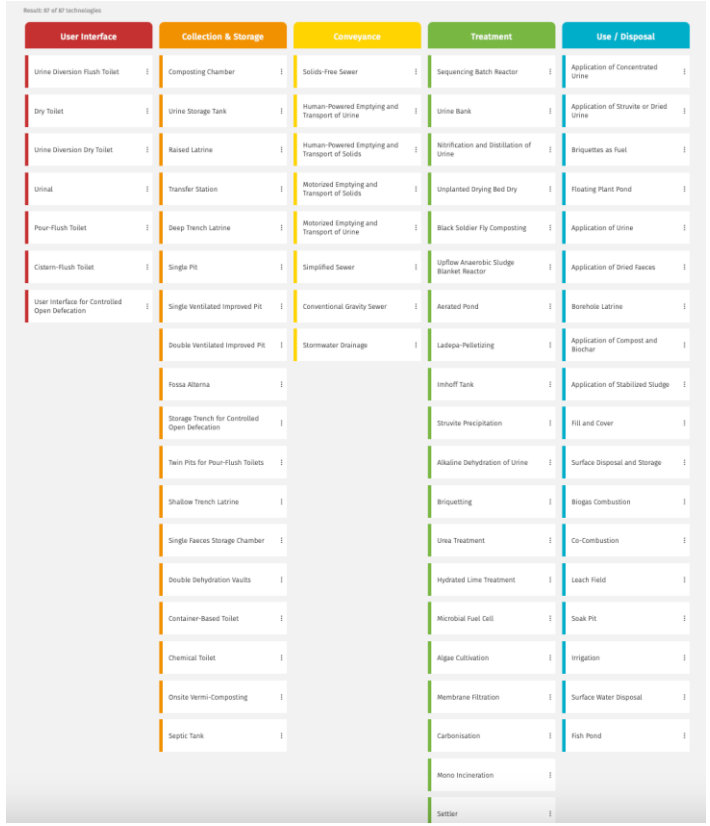
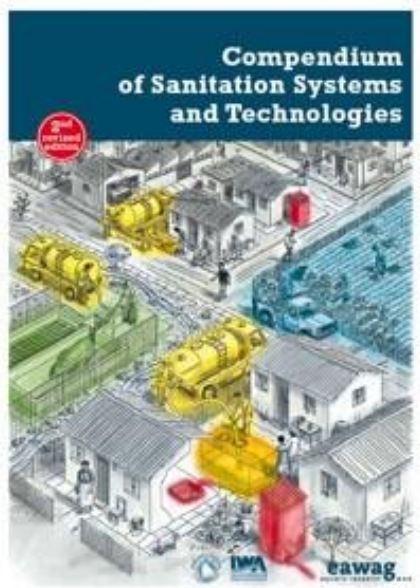
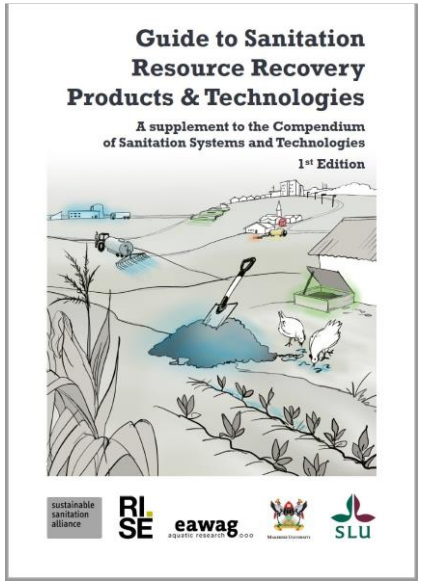
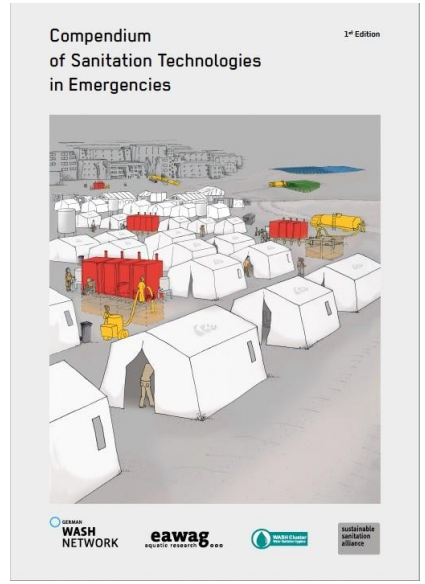
Technology Library









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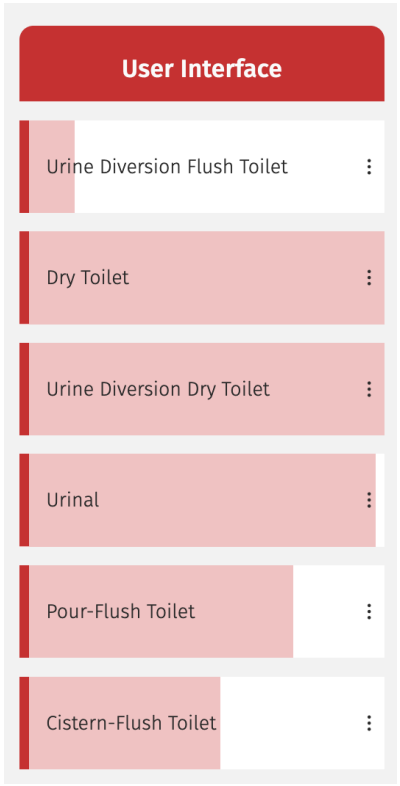
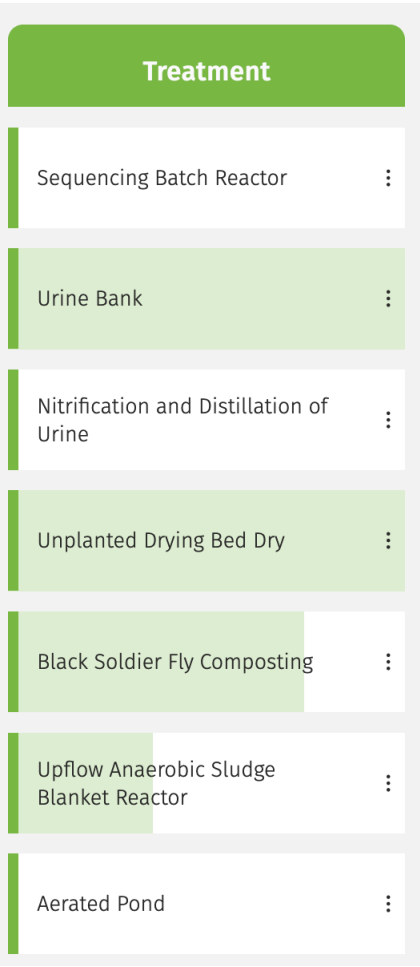
Advanced Appropriateness Filter





Advanced Appropriateness Filter

SaniChoice

Physical

- Temperature
- Flooding
- Vehicular Access
- Slope
- Soil Type
- Groundwater Depth
- Excavation
- Surface Area (Onsite)
- Surface Area (Offsite)

Technical

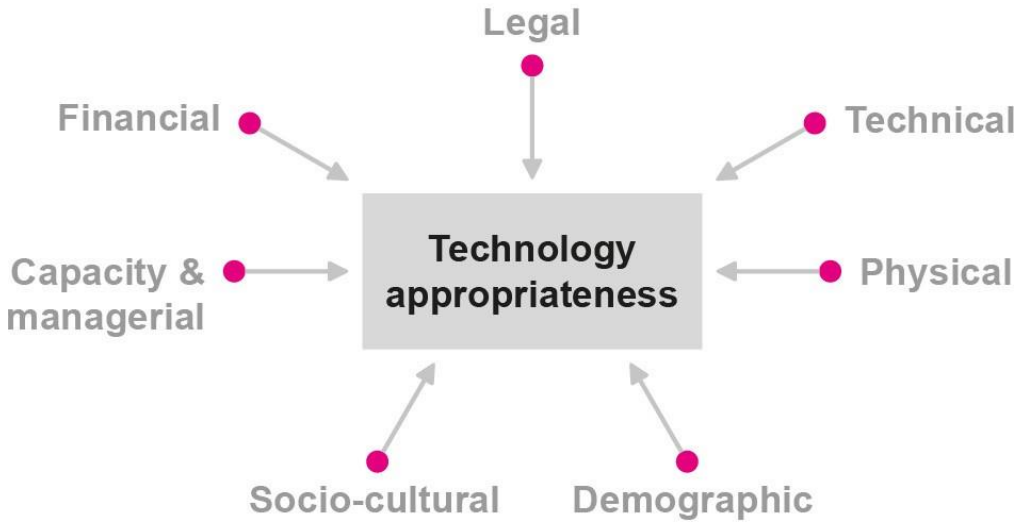
- Water Supply
- Water Volume
- Electricity Supply
- Fuel Supply
- Frequency of Operation and Maintenance
- Pipe Supply
- Pump Supply
- Concrete Supply
- Spare Parts Supply

Legal and managerial

- Drinking Water Exposure
- Construction Skills
- Design Skills
- Operation and Maintenance (O&M) Skills
- Cleansing Method

Socio-cultural

- Cleansing Method



Emergency

- Construction Parts Supply
- Lifetime
- Scalability
- Speed of Implementation

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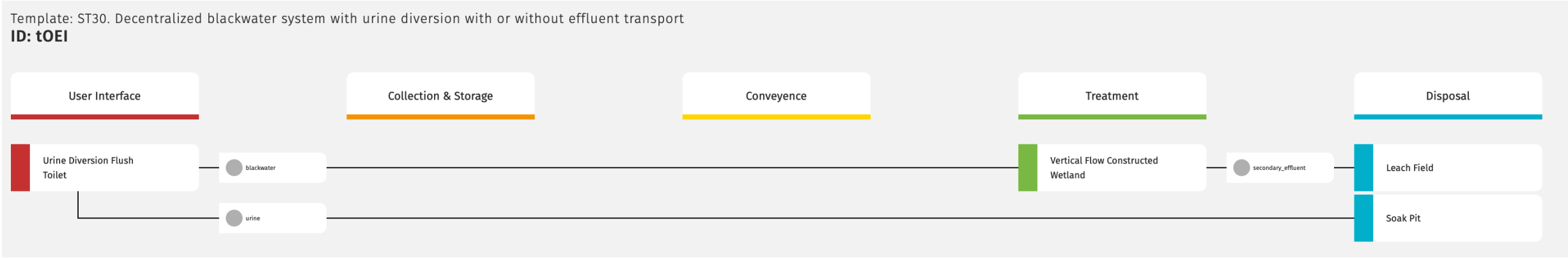
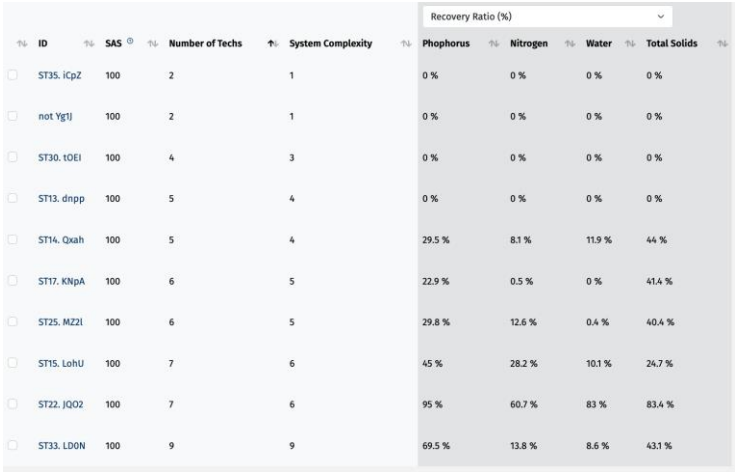
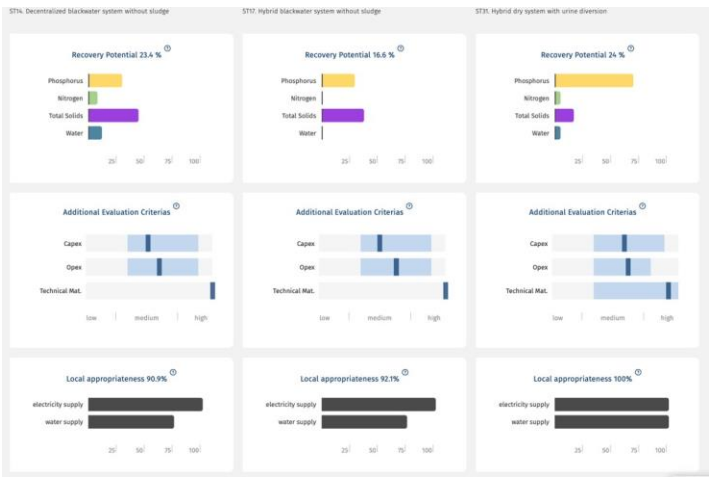
Generate and Compare Systems





ID	SAS	Number of Techs	System Complexity	Recovery Ratio (%) Phosphorus	Nitrogen	Water	Total Solids
ST35. iCpZ	100	2	1	0 %	0 %	0 %	0 %
not Yg1J	100	2	1	0 %	0 %	0 %	0 %
ST30. tOEI	100	4	3	0 %	0 %	0 %	0 %
ST13. dnpp	100	5	4	0 %	0 %	0 %	0 %
ST14. Qxah	100	5	4	29.5 %	8.1 %	11.9 %	44 %
ST17. KNpA	100	6	5	22.9 %	0.5 %	0 %	41.4 %
ST25. MZ2I	100	6	5	29.8 %	12.6 %	0.4 %	40.4 %
ST15. LohU	100	7	6	45 %	28.2 %	10.1 %	24.7 %
ST22. JQO2	100	7	6	95 %	60.7 %	83 %	83.4 %
ST33. LD0N	100	9	9	69.5 %	13.8 %	8.6 %	43.1 %



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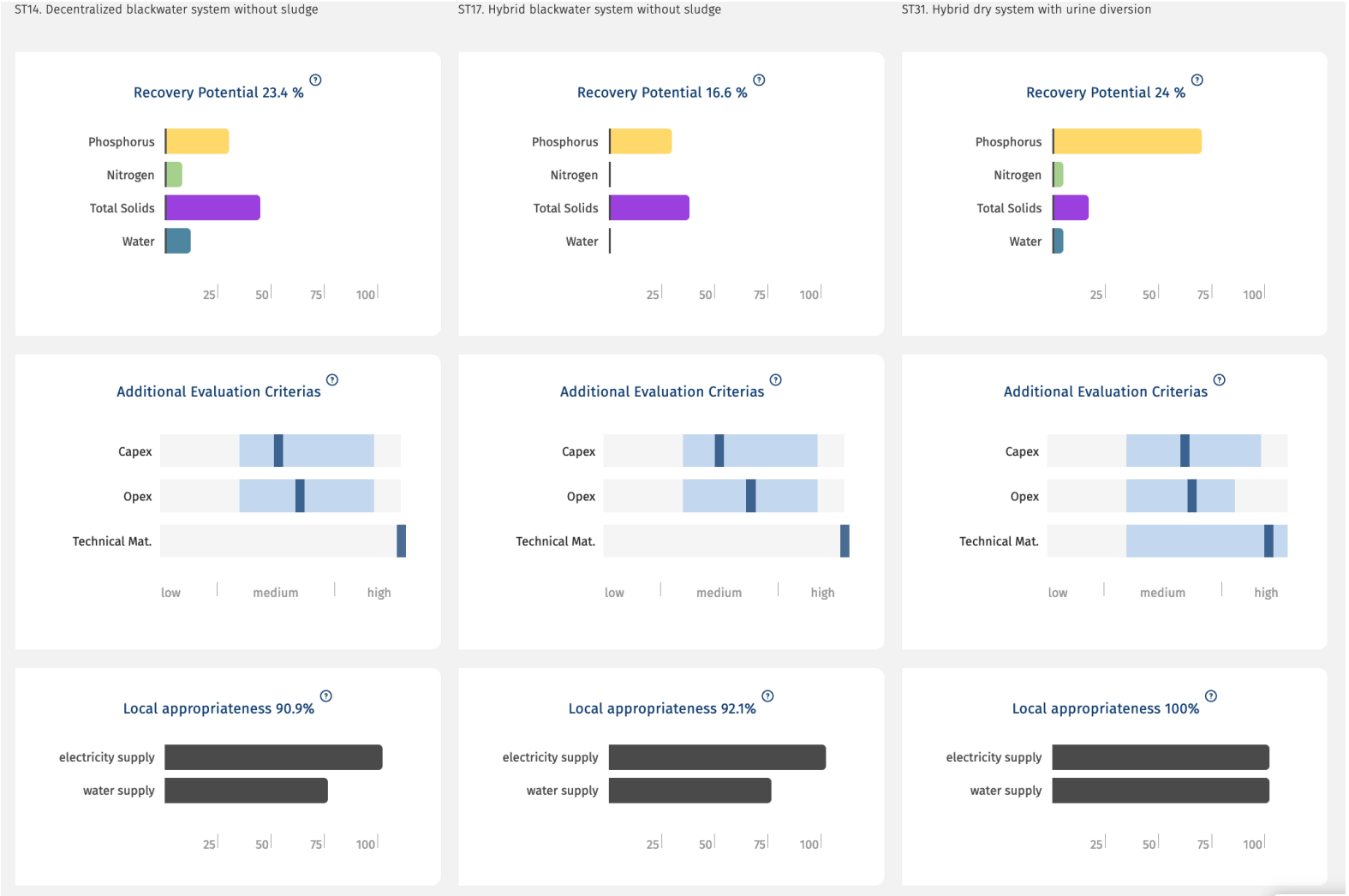
Generate and Compare Systems



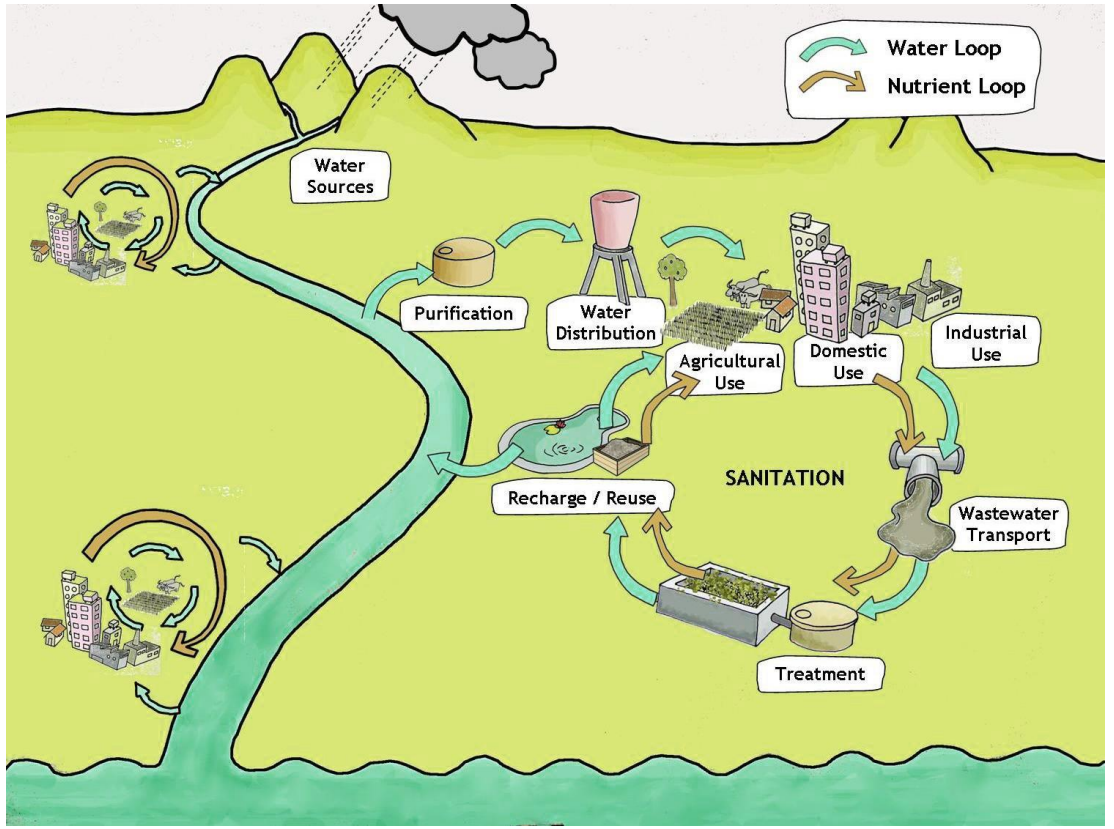
Sanitation Planning Challenge #3:

Design for Resource Recovery

Target

6.3

By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally



Sanitation Planning Challenge #4

Participation

Community engagement & participation is crucial for sustainability

1. **Specific consideration of local preferences and negotiations around trade-offs**
2. Increases ownership for infrastructure and services
3. Participation during the planning stage leads to a better design;
4. Efficiency & effectiveness: increase of community contributions;
5. Has instrumental value = from passive residents to active residents

SaniChoice

Planning with SaniChoice

CITYWIDE INCLUSIVE SANITATION (CWIS)

		Workshops
1	Develop understanding and commit to prepare CWIS	W0 : Inception Workshop
2	Situation Analysis	W2 : Situational Assessment and Setting Objectives
3	CWIS Planning Workshops	W1 : Defining Local Priorities. (*Focal Group Discussion per Ward)* W3 : Technology and System Selection Criteria
4	Detailed Analysis technology options, financial and institutional arrangement	
5	CWIS Plan Finalization	W4 : Selection of System Options
6	Endorsement of the Plan by the Municipal Authorities	W5 : Endorsement of Plan

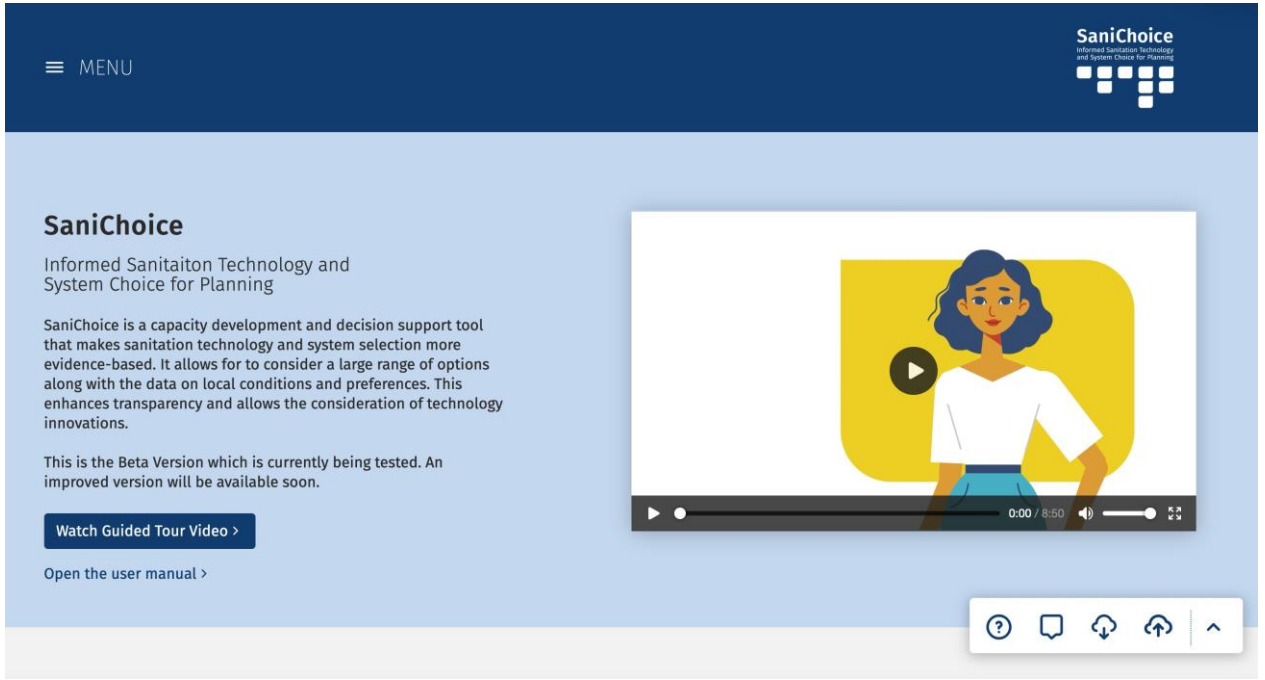
SaniChoice

- Preselection
- Appropriateness Assessment
- *Appropriate technologies*
- *Generation of systems*
- Comparison of Systems
- *Appropriate systems and their performance*

SaniChoice

Current status

- Validation of Beta version showed the need to simplify the appropriateness criteria and improve the user guidance
- Validation of training package, manuals, and planning guide in CWIS planning in Changunarayan, Nepal currently going on
- Fully working version expected by the end of the year



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Thank you!

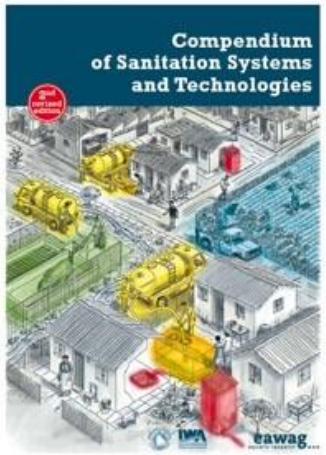
Questions?

www.sandec.ch

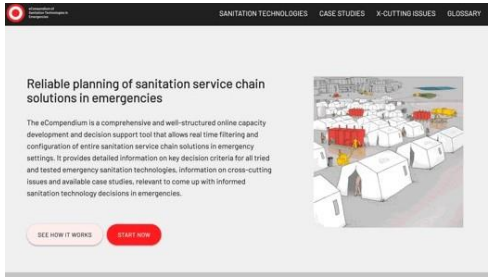
dorothee.spuhler@eawag.ch

Dorothee Spuhler
Swiss Federal Institute of Aquatic Science and Technology – Eawag

www.sandec.ch/compendium



https://www.emersan-compendium.org/fr/



SaniChoice
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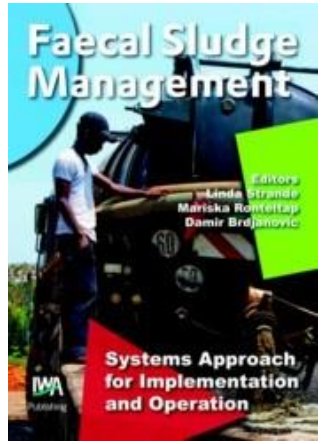
www.sanichoice.net

www.sandec.ch/clues



https://www.eawag.ch/en/department/sandec/publications/fsm-book/

forum.susana.org

32nd SuSanA Meeting
22nd August 2022
Susana Africa Chapter Presentation

Sareen Malik (Coordinator) &
Chaiwe Mushauko-Sanderse (Co-coordinator)

Content

1. Background
2. Governance and Structure – The Board Advisory Committee , Implementation Unit
3. Recent and Planned activities
4. Partnerships and Funding

1. SuSanA Africa Chapter Background

SuSanA Africa Chapter Background

Established in 2020 , with support from the now-ended WSSCC the SuSanA Africa Chapter aims to increase SuSanA's reach on the African continent:

- By using a demands-based approach to provide knowledge products, community of practice and learning services.
- By being an anchor, at a regional level of the sanitation sector in Africa to the SuSanA global sector Network
- By facilitating sector knowledge sector within the region and beyond
- By connecting and creating an alliance with regional funders
- By serving as a regional networking, communication and coordination hub.
- By enabling greater visibility and influence of WASH CSOs in sanitation from African countries to actively engage in the WASH sector at regional and global level.

2. Governance and Structure

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SuSanA Africa Chapter Governance and Structure

Global components

Global Host Organisation: GIZ

Global steering committee (GSC)

Global Secretariat

Other Regional Chapters

Steering

Regional Host Organisation : ANEW

Support

Exchange

Upcoming election

Chapter advisory committee

AMCOW, AFDB, WaterAid, WSUP, KWASNET, TAWASANET, UWASNET, Speak up Africa, PASA, AWSPN, Butterfly Effect, Global secretariat / Forum / core group

Implementing Unit

Chapter coordinator and co-coordinator

Outputs (Strategic Areas of Focus)

- Knowledge resources
- Forum engagement

Base funding

Sourcing Phase

Regional components

SuSanA Africa Chapter Governance and Structure

Regional Host Organisation: The African Civil Society Network on Water and Sanitation (ANEW)

- Is an autonomous Africa- wide platform set up to ensure that diverse voices of African CSOs are represented and heard in policy development and implementation
- Has been charged in its mandate by the African Ministers' Council on Water (AMCOW)
- Promotes dialogue, learning and cooperation on water and sanitation issues in Africa and provides a platform for sharing and coordinating voices of its members, who include civil society organizations and academia.
- Was established by African CSOs recognized by governments and other major stakeholders in the water and sanitation (WASH) and water resource management (WRM) sector at the national, regional, pan-African and international levels.
- Advocates for the leaving no one behind agenda, Gender and WASH, Climate change and Water Sustainability as prescribed by its members.

SuSanA Africa Chapter Governance and Structure

Chapter Advisory Committee part of the Board Advisory Committee

- AMCOW
- AFDB
- WaterAid
- WSUP
- KEWASNET
- TAWASANET
- UWASNET
- Speak up Africa
- SuSanA Global secretariat / Forum / Core-group

Implementing Unit

- **Chapter coordinator:** Sareen Malik since inception 2022
- **Co-coordinator:** Chaiwe Mushauko- Sanderse since June 2022

Strategic Areas of Focus

The SuSanA Africa Chapter is currently strategically focused on the below four main activity areas:

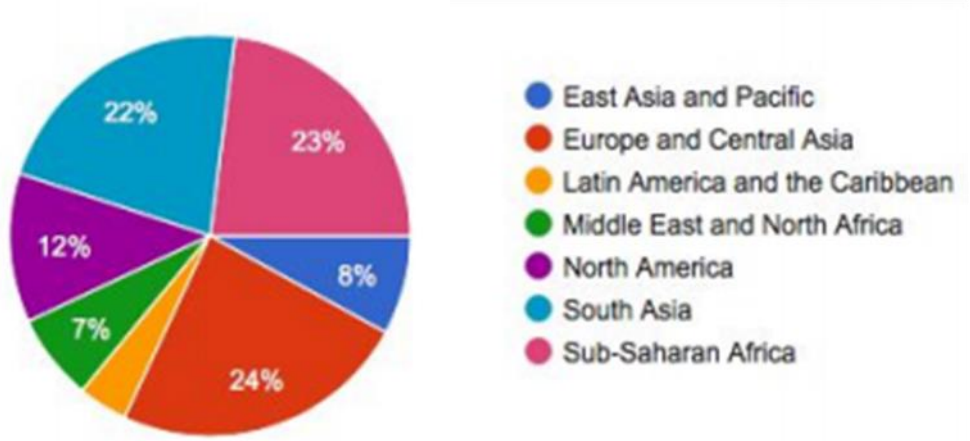
1. Establish, curate and maintain a regional knowledge hub
2. Empowerment of the leadership of African Women in the WASH sector
3. Strengthening of individuals and youth organisations partnerships in the WASH sector
4. CSO engagement in key WASH processes and events

2. Recent and Planned Activities in Relation to The 4 Activity Areas

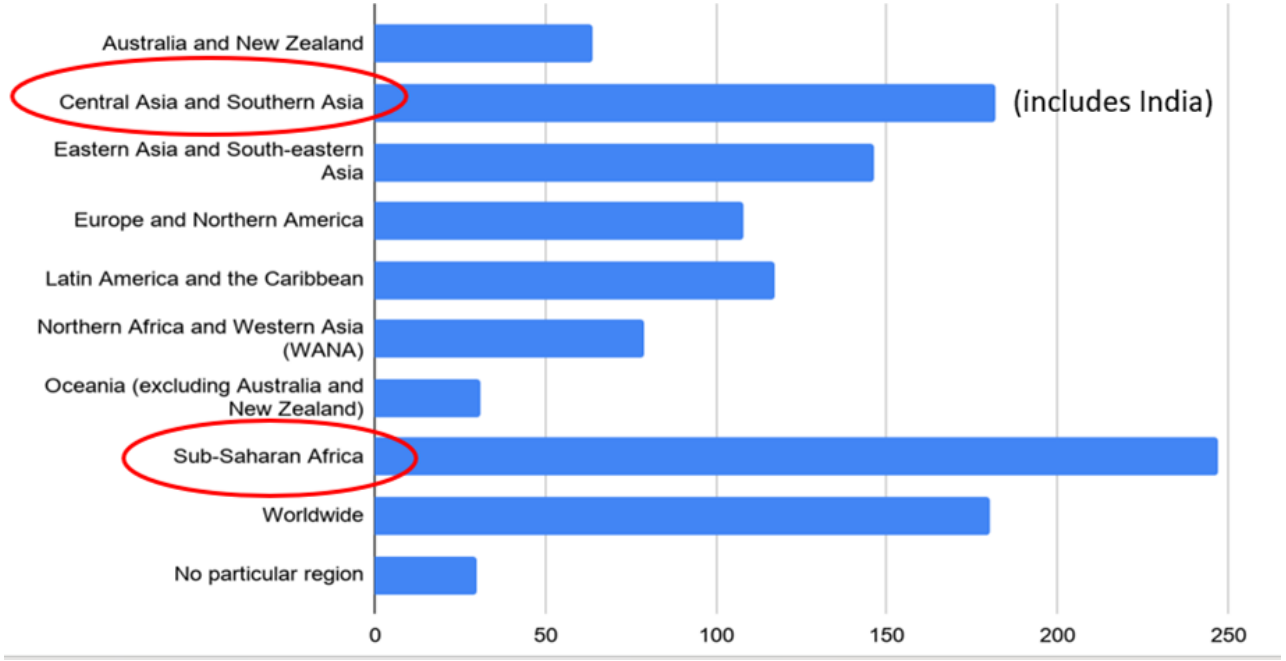
Regional Knowledge Hub

An integrated approach towards Regional Knowledge Management; AMCOW Hub of Hubs, SuSanA Forum

- SuSanA Forum member survey revealed 24% of SuSanA's 13,000 members are from Sub-Saharan Africa (Larger in comparison to all represented regions)

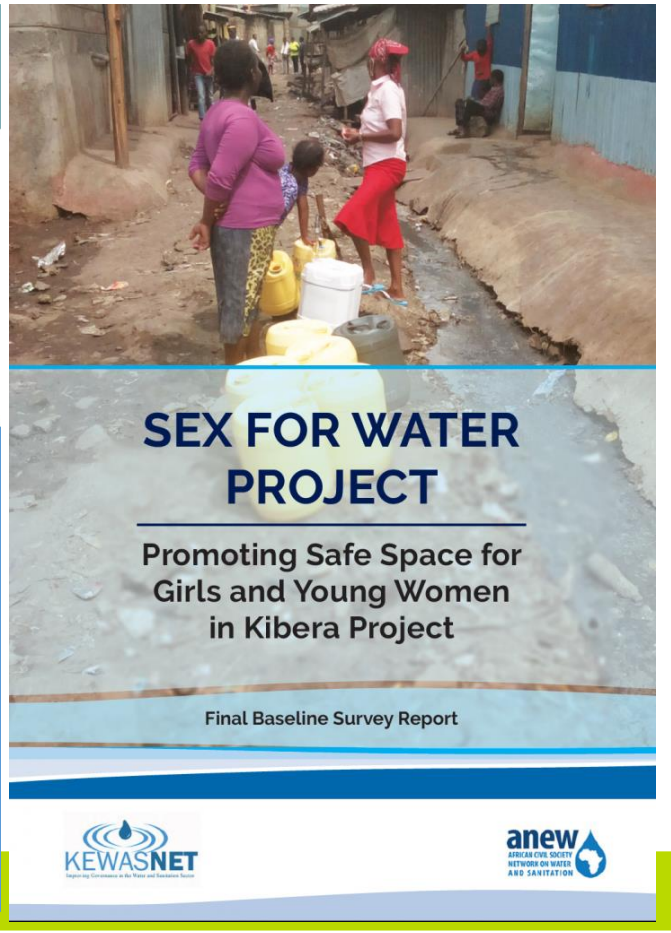


- SuSanA users showed more interest in Knowledge sharing and information on Sub-Saharan Africa



African Women in the WASH sector

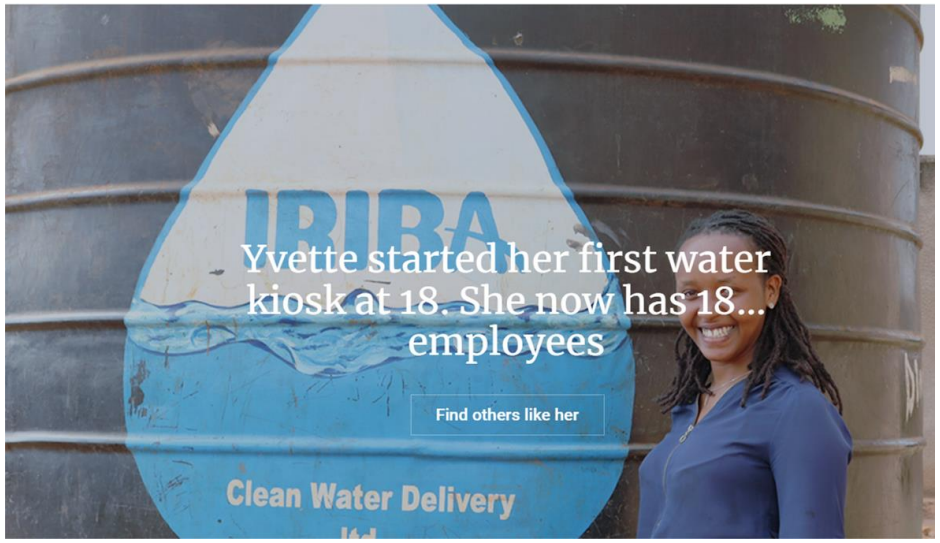
Innovative and evidence-based water initiatives that advance water sector transformation and catalyse systems change for improved gender equity.



African Women in the WASH sector

Strengthening of individuals and youth organisations partnerships in the WASH sector

YOUNG WATER SOLUTIONS



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Promoting Young engagement

CSO engagement

CSO engagement in key WASH processes and events

- Drive development debates and actions that prioritise gender, youth, equality and inclusion in CSO WASH Interventions
- Build and strengthen the capacity and participation of African CSOs in ongoing sector processes such as National Sanitation Conferences or joint sector reviews
- Dissemniation of the African Sanitation Policy Guidelines (ASPG)

4. Partnerships and Funding

Partnerships and Funding

The SuSanA Africa chapter has built string partnerships in implementing key sector activities that align with the SuSanA Network Agenda as follows:

AMCOW- Regional Knowledge Management

AfWA- Leadership Programme, Digital WASH

ASPG-

SWA- UN 2023 and MAM

Events

UN 2023

Thank You

Time for Feedback

Answer a short survey (1 min) to help us improve the upcoming SuSanA meetings

Scan the QR code with your phone or click on the link in the chat

Link : https://app.wisembly.com

Password: m9750e4

Time for Coffee, Tea or Snacks

(45 Minutes Break)

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32nd SuSanA Meeting

Monday, 22nd August 2022

Part 2

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Agenda – Part 2 (13:00 – 17:00 CEST)

Time (CEST)	Session	Presenter(s)
13:00 – 13:25	**Updates from the Secretariat and on SuSanA 2.0**	SuSanA Secretariat & Alejandra Burchard Levine (ISC)
13:25 – 13:45	**WG 03** Climate Mitigation and Adaption	Thorsten Reckerzügl, Martin Kerres (WG 03), Juliet Willetts (UTS) & Jose Gesti (SWA)
13:45 – 14:30	**Speed Launches**	
14:30 – 14:45	Coffee & Tea Break	
14:45 – 15:00	**SuSanA forum moderation -** Updates and Way forward	Chaiwe Mushauko-Sanderse & Paresh Chhajed-Picha (Forum Moderators)
15:00 – 15:15	Input from the **Latin-America Chapter**	Lourdes Valenzuela (SuSanA Latin-America Chapter)
15:15 – 15:35	Introduction to the **WASH!Game** & **RECLAIM Game**	Belinda Abraham and Dennis Walter (Viva con Agua) & Jennifer McConville (SLU)
15:35 – 15:50	Coffee & Tea Break	
15:50 – 16:10	**WG 07** Sustainable WASH in Institutions and Gender Equality	Belinda Abraham & Bella Monse (WG 07)
16:10 – 16:55	**Papers to practice:** GHG emissions from different sanitation systems	Laura Kohler & Dorothee Spuhler (WG 01)
16:55 – 17:00	**Closing**	Arne Panesar and Sareen Malik

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SuSanA 2007-2022 (and beyond):
Introduction, updates and future developments in SuSanA

Alexandra Dubois, Maren Heuvels and
Daphne Manolakos (SuSanA Secretariat)

What is SuSanA?

- The **Sustainable Sanitation Alliance** (SuSanA) is a **Sector Think-Tank** and an **open, dynamic and global network**
- More than **14,300 individual registered users** and **380+ partner organisations**
- The goal is to contribute to the **achievement of the SDGs** by **promoting sanitation systems based on principles of sustainability**

Meet the SuSanA Secretariat

- Hosted by GIZ since 2007 with base funding from BMZ
- Secretariat is one of the key thematic areas under the GIZ Sector Programme ´Water Policy – Innovations for Resilience´

Dr. Arne Panesar
Head of Secretariat

Alexandra Dubois

Maren Heuvels

Teresa Häberlein

Daphne Manolakos

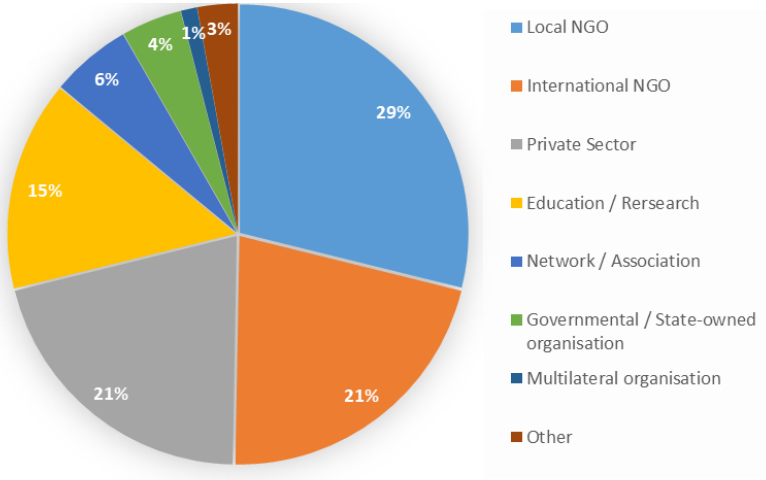
Yuxiao He

Key tools and services of SuSanA include…

SuSanA features a range of tools for collaboration and knowledge sharing

SuSanA Outreach in numbers

- More than **300.000** visitors at susana.org per year
- Total Forum Users: **14,500**
- Total Forum Posts: approx. **28,000**
- Total Subjects: approx. **6,000**
- New Forum Users: approx. **750** per year



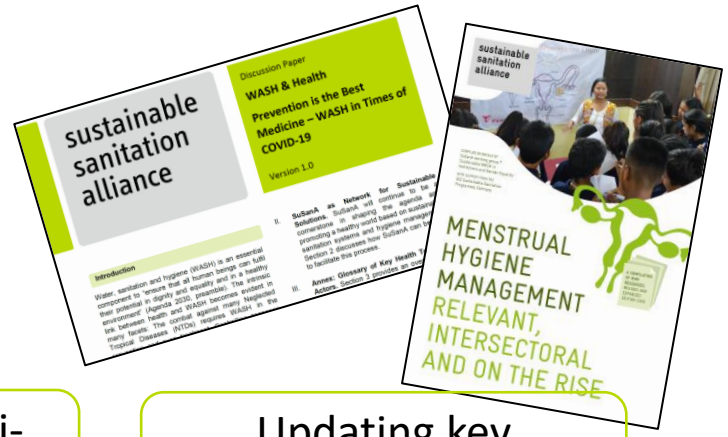
- Newsletter Subscribers: **6,500**
- Social Media Outreach
  - Linkedin (new): **600+**
  - Facebook: **12,600+**
  - Twitter: **6,200+**

What‘s new in SuSanA?

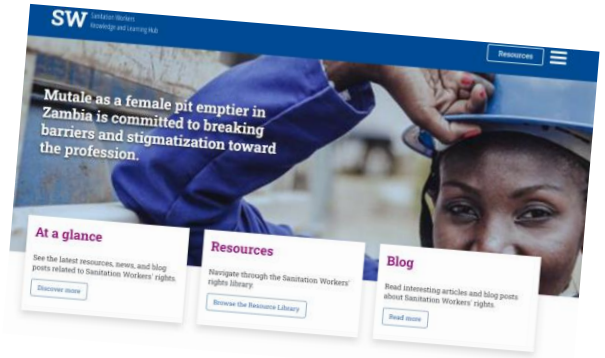
New Multimedia Page

New Partner Application Step: Upload Events and Projects

SuSanA goes multi-lingual



Updating key publications



New SuSanA sister: Sanitation Workers Knowledge and Learning Hub

Join the Networks Circle: We are stronger speaking with one voice!

SuSanA links local & global level @ conferences

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SuSanA at World Water Week 2022

23 August - 1 September 2022

World Water Week

ORGANIZED BY SIWI

SuSanA at World Water Week (1/4): On-Site Exhibition

- Visit our on-site SuSanA booth to connect, exchange and advocate for sustainable sanitation as key contributor of the SDGs.
- We've got a lot of surprises in store for you, including a Virtual Reality station, an innovation corners, a game area, a library, etc.
- Don't miss our demonstrations at the booth:

Session	Date & Time	Presenter(s)	
WASH!Game	Wednesday, 31.08 10:00-11:00	Viva con Agua	
The PuPu Pump mobile pit emptying unit	Wednesday, 31.08 14:00-15:00	Practica Foundation	
RECLAIM Game	Thursday, 01.09 11:00-12:00	Swedish University of Agricultural Sciences	
WASH systems Academy free online courses	Thursday, 01.09 13:00-14:00	IRC	

SuSanA at World Water Week (2/4): On-Site Activities

Sunday 28th August

- **SuSanA Informal Face-to-Face Meeting (1.00-4.00pm, SEI offices)**

We invite all SuSanA members present in Stockholm for an informal meeting on Sunday prior to the on-site conference to discuss and reflect on the past, present, and future of SuSanA. See you at the SEI headquarter's offices where we will be waiting for you at the SEI lounge.

- **Game Session (4.30-6.30pm, SEI offices)**

Right after the meeting, we'll offer for all gamers at heart in our SuSanA community the opportunity to test two innovative board games relevant for our sector, namely the WASH!Game from Viva con Agua and the RECLAIM Game from SLU.

- **SuSanA drinks and dinner (from 7.00pm, Djurgårdsbron - Sjöcafé)**

Any plan for Sunday evening? For those who wish, let's have drinks and dinner together before the start of the on-site conference!

SuSanA at World Water Week (3/4): SuSanA as a Convenor

Wednesday, 24 August
13:00-14:20

Wednesday, 24 August
15:30-16:50

Tuesday 30, August
11:00-11:30

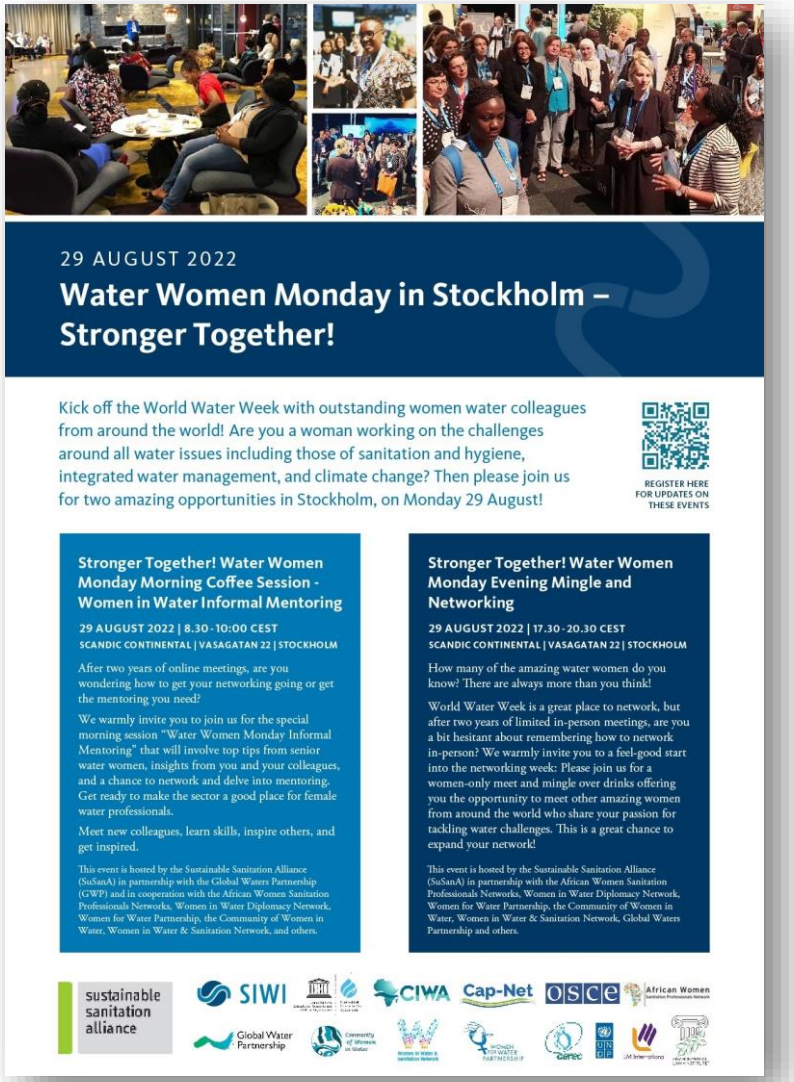
Wednesday, 31 August
16:00-17:30

Check out the Sessions online or on-site!

SuSanA at World Water Week (4/4): Water Women Monday

Monday, 29 August 2022 at Scandic Continental

- **Morning Coffee Session** – Women in Water Informal Mentoring (8.30-10.00 CEST)
- **Evening Mingle and Networking** (17.30-20.30 CEST)



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On the way to SuSanA 2.0

Updates on the Organisational Development

Alejandra Burchard Levine
(Interim Steering Committee)

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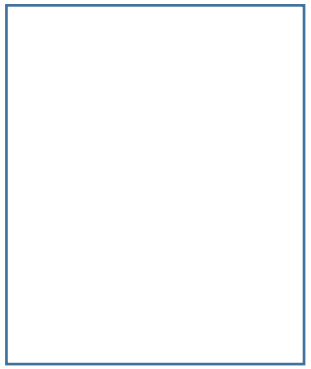
ISC Members



N.N. (Africa)

Christoph Lüthi

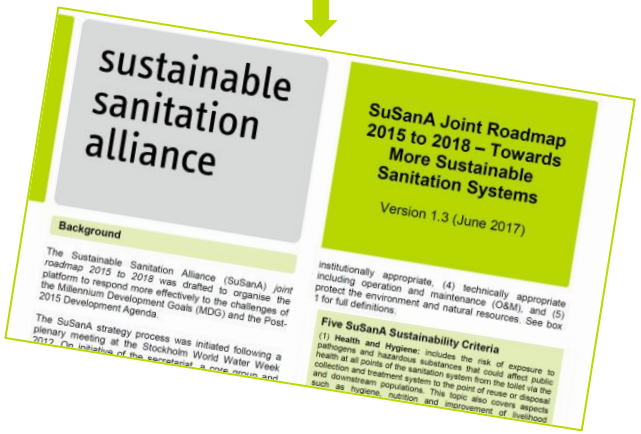
Hiba Abu Al Rob

Alejandra Burchard Levine

Susmita Sinha

From SuSanA 1.0 to SuSanA 2.0

2015 – 2018 | 2019 | 2020 | 2021 | 2022 | 2023+



Change Management Task Force (CMTF)

Phase 0 – Setting up the CMTF
Phase 1 - Initialisation
Phase 2 – Concept Dev.
SuSanA Governance 2.0
Phase 3 – Decision-making
Phase 4 – Implementation

Interim Steering Committee (ISC)

-Shortlisted regional host institutions
-Reviewed GSC ToRs and website
-Proposing candidates for GSC

GSC Election Process (Autumn 2022)

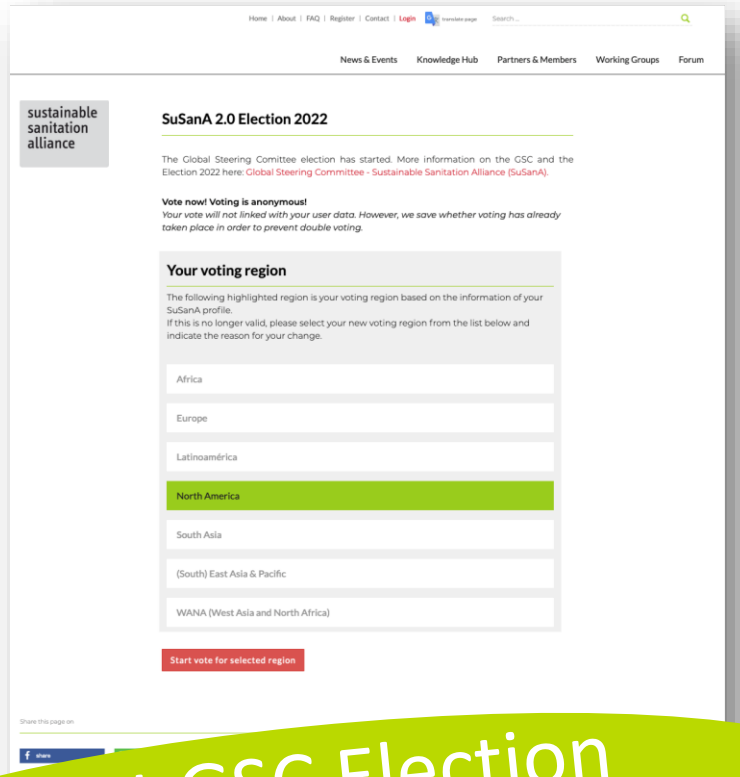
Global Steering Committee (GSC)

Additional or new SuSanA funding and host(s)?
New legal settings beyond a hosted network?

Global Steering Committee (GSC) – Election 2022

- The Global Steering Committee (GSC)
  - principal decision-making body during 3-years term (renewable once)
  - responsible for governance and financial oversight, and resource mobilisation of SuSanA
  - Positions of the GSC are voluntary and unpaid
  - each GSC member is expected to commit 3 to 4 hours per month

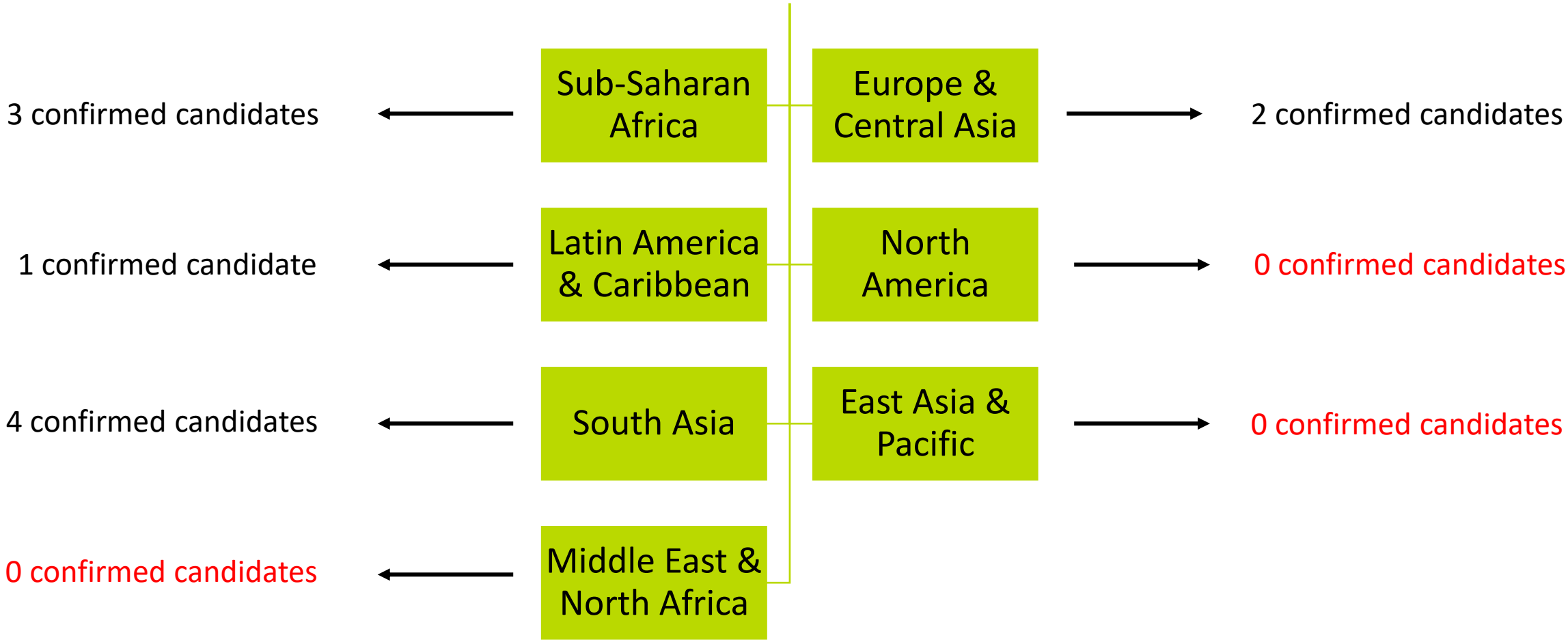
- The Role of SuSanA´s Global Steering Committee Members (ToR) - Resources • SuSanA



First GSC Election Autumn 2022

Composition of the GSC

GSC Election 2022



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WG 03:
Climate Mitigation and Adaption

Thorsten Reckerzügl and
Martin Kerres (WG 03)
Juliet Willetts (UTS)
Jose Gesti (SWA)

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Agenda

- Martin Kerres, giz: Key messages from the WaCClim project
- Juliet Willetts, UTS: Presentation of 3 publications on climate resilient urban sanitation: BMGF Landscape report, Report from UTS-UI-UNICEF, SWA Paper on climate resilient WASH
- José Gesti, SWA: Water related updates on COP27 and an input on the development of climate financing guidelines for sanitation

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Announcements

Climate & Sanitation live podcast

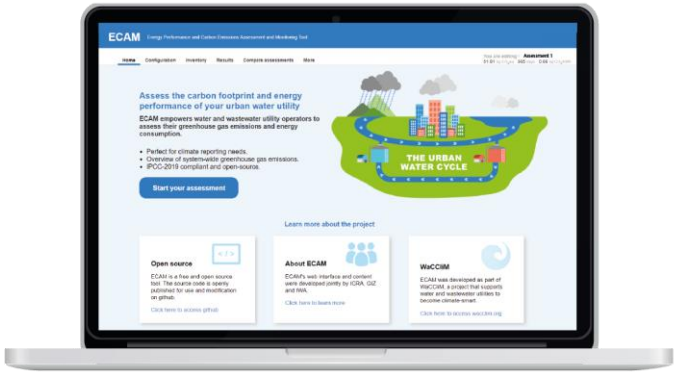
- Today at 4:10 pm at the WG 1, Capacity Development session
- “Papers to Practice” podcast series by Laura Kohler (CAWST) and Dorothee Spuhler (eawag)
- 3 climate related sanitation publications will be live recorded jointly with the authors during the WG session this afternoon

Connecting non-sewered sanitation to climate finance. Missing links?

- Tomorrow, at 1pm, online at WorldWaterWeek
- Panel session with different international experts, co-hosted by WASTE Netherlands and FINISH Mondial

WaCCliM Key Messages

- Water and sanitation actors need to know **how national GHG accounting and reporting works**
- Potential to **include mitigation as low hanging fruit in adaptation processes**
- Potential for GHG mitigation in sanitation activities **differ among locations**, depending e.g. on energy mix and topography
- Sanitation providers might **prepare for donor recognition and a head-start on future regulations**, by measuring GHG emissions and prioritising mitigation measures
- Climate mitigation is not always economically viable under existing framework conditions and **often requires an accompanying policy/regulatory process**
- Measuring and reducing GHG emissions **can also succeed in an onsite sanitation context**



WaCCliM's partner utilities in San Francisco del Rincón, Mexico expanded wastewater treatment

Water and Wastewater Companies for Climate Mitigation

WaCCliM

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Update BMGF landscape report

- Purpose: to consolidate current leading practice, challenges, evidence gaps and way forward

Asian Development Bank, Urban Climate Change Resilience Trust Fund (UCCRTF)	African Civil Society Network on Water and Sanitation (ANEW)	African Water Association (AfWA)	Aguas De Portugal	Asian Institute of Technology (AIT)	Aquaya	Administrative Staff College of India (ASCI)	African Development Bank (AfDB)
Bappenas, Indonesia	BORDA Zambia	Bangladesh Rural Advancement Committee (BRAC)	Brilliant Sanitation Limited	Bristol University	British Geological Survey	Container Based Sanitation Alliance (CBSA)	Consortium for DEWATS Dissemination Society (CDD)
Center for Water and Sanitation, CEPT University	Department of Public Health Engineering (DPHE), Bangladesh	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)	Eastern and Southern African Water and Sanitation Association	Ecole Polytechnique de Thiès Senegal	Green Climate Fund (GCF)	Global Green Growth Institute (GGGI)	GHD
Guam Waterworks Authority	ICLEI - Local Governments for Sustainability	IHE Delft Institute for Water Education	Indian Institute for Human Settlements (IIHS)	International Institute for Environment and Development	IMC Worldwide Ltd.	International Water Association (IWA)	International Water Management Institute (IWMI)
Kampala Capital City Authority (KCCA)	Kathmandu University	Kyambogo University, Uganda	Leeds University	Manila Water	National Sanitation Office of Senegal (ONAS)	Practical Action	Programme Solidarité Eau (Ps-Eau)
Royal University of Phnom Penh	RTI International India	EAWAG Department Sanitation, Water and Solid Waste for Development (SANDEC)	Stockholm Environment Institute (SEI)	Stockholm International Water Institute (SIWI)	SNV - Regional, Bangladesh, Nepal	Solomon Island Water Authority	Stantec
Sustainable Sanitation Alliance (SuSanA)	Sanitation and Water for All (SWA)	Toilet Board Coalition	UN-Habitat	UNICEF - Global, Nepal	United Cities and Local Governments Asia Pacific (UCLG ASPAC)	USAID	Vietnam Water Supply and Sewerage Association (VWSA)
	Water Authority of Fiji (WAF)	WASH Institute, India	WaterAid UK	World Health Organization (WHO)	The World Bank	Water & Sanitation for the Urban Poor (WSUP) - Global, Bangladesh, Madagascar	

- Participatory workshops >75 organisations
- Sanitation actors: Governments, cities, utilities, associations, implementers NGOs and researchers
- Climate and urban development actors

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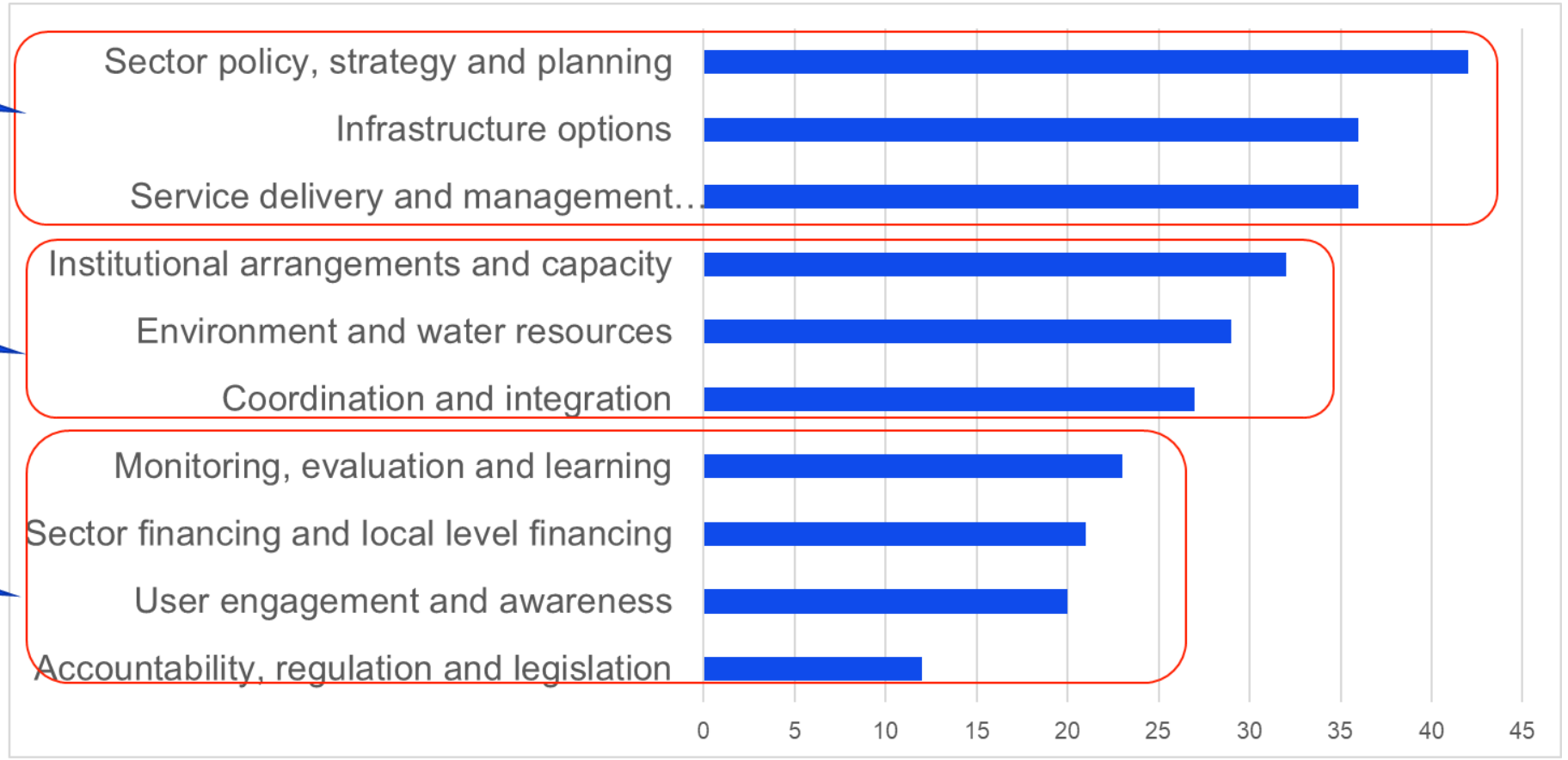
Current focus – climate and urban sanitation

Most focus to date

Some focus to date

Limited focus to date



JW

UTS Institute for Sustainable Futures

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Leading practice – climate and urban sanitation

Institutions, policy and planning

- Policy integration
  - Integrating urban sanitation in national climate action planning (Uganda, Nepal, Bangladesh, World Bank CCDRs)
- New strategies and frameworks
  - Comprehensive strategies, frameworks and guidance to support climate resilient WASH programming (UNICEF, USAID, Green Climate Fund, World Bank 'Utilities of the Future', WHO)
- Institutional and regulatory reform
  - Targeting institutional reforms through infrastructure investments (ADB)

Finance

- Engaging with the climate financing community (WHO, UNICEF, SWA)
- Linking government WASH departments to climate funders and providing support to prepare grant applications (Bangladesh)
- Emerging research on different ways of financing resilience and measuring this for urban sanitation
- Potential of certified climate bonds or green municipal bonds to finance the needs of urban sanitation, although the effectiveness needs to be evaluated (HIC, US, Australia)

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Leading practice – climate and urban sanitation

Infrastructure and Service Provision

- Nexus between digital technology and climate resilient sanitation
  - Potential of artificial intelligence to plan sanitation interventions more effectively and efficiently (World Bank)
- Innovative climate resilient sanitation infrastructure
  - Provision of good onsite sanitation in drought-prone areas, which are reliant on groundwater (World Bank Zambia)
- Nature-based solutions
  - City-wide integrated approach in small cities (GCF)
- Working with private sector, CBOs and municipalities (Madagascar, Bangladesh, Nepal)

User engagement

- Incorporating user experiences while designing flood-prone toilets and piloting these models in the community (Lusaka, Indonesia)
- Training community based organisations to manage sanitation infrastructure projects (Togo)
- Research to understand user perceptions and preferences for suitable sanitation options for different local climate context
- Risk Communication and Community Engagement (RCCE) strategy for urban and rural sanitation (Bangladesh)

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Challenges – climate and urban sanitation

Institutions, policy and planning	Lack of **coordinated policies** and wider coordination between climate, disaster and sanitation
Financing	Sanitation **budgets do not account for the costs of resilience** and adaptation (both increased capex and opex)
Infrastructure and service provision	Lack of **understanding** on how to deliver climate resilient city-wise inclusive sanitation
User engagement	Poor **use of data from households** and communities by local governments

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A knowledge and learning agenda

UTS Institute for Sustainable Futures

Implications and way forward

- ACTION 1: Engage with climate policy and better coordinate with urban resilience and other sectors
- ACTION 2: Shift and test new policy and practice to incorporate climate risks and resilience
- ACTION 3: Consolidate and continue to build the evidence base on climate resilient urban sanitation
- ACTION 4: Facilitate rapid learning and capacity building on key risks and adaptation responses

Report to be released shortly

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Update UTS-UI-UNICEF report

- Impacts on urban sanitation in four cities
- Co-developed framework for climate resilient urban sanitation

https://www.unicef.org/indonesia/reports/climate-resilient-urban-sanitation-indonesia-hazards-impacts-and-responses-four-cities

https://doi.org/10.1177%2F23998083221098740

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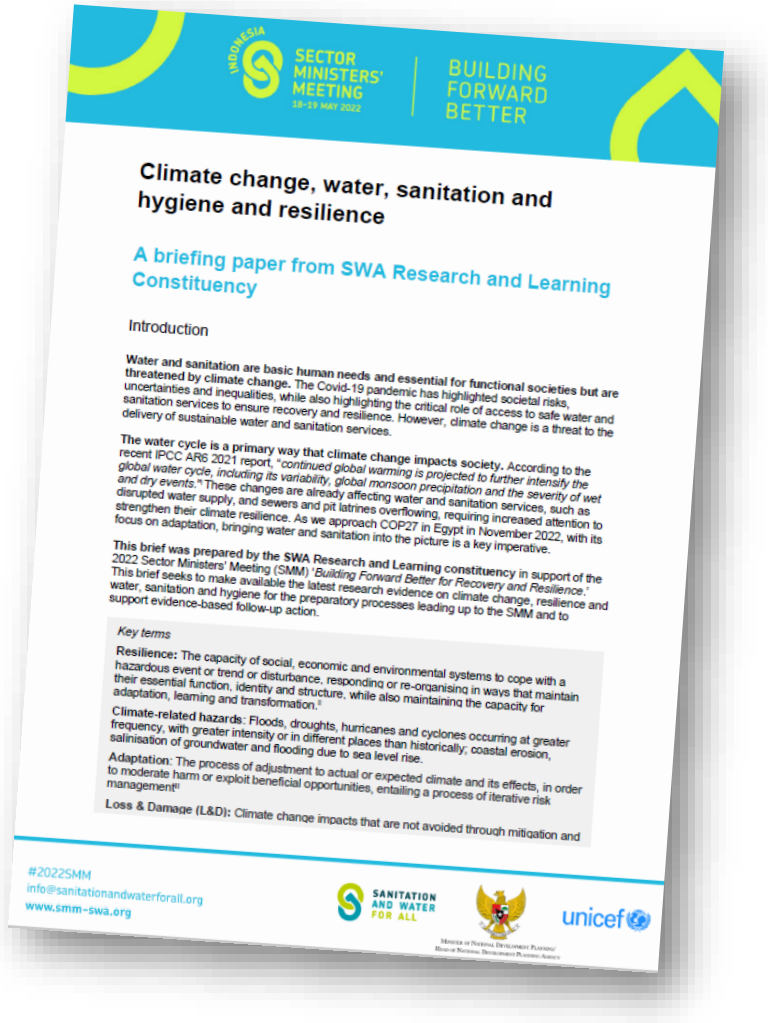
Update SWA Paper Climate WASH

- Collaborative effort in Research and Learning (R&L) Constituency
- Prepared for the SWA Sector Minister's meeting 2022
- Evidence to policy and practice



https://www.sanitationandwaterforall.org/sites/default/files/2022-04/2022SMM-SWA%20Climate%20Task%20Team-Briefing%20paper_0.pdf

UTS Institute for Sustainable Futures

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Update SWA Paper Climate WASH

- Three main arguments:
  - Importance of water and sanitation for societal resilience
  - Vulnerability of water and sanitation services to climate change
  - How to deliver climate resilient water and sanitation services

COP27 Update

COP 27, 6-18 November 2022

Egypt looks forward to hosting the next Climate Conference for the year 2022 (COP27), representing the African continent, noting that the Egyptian state believes in the importance of the water sector in climate change.

Main water Elements of COP27

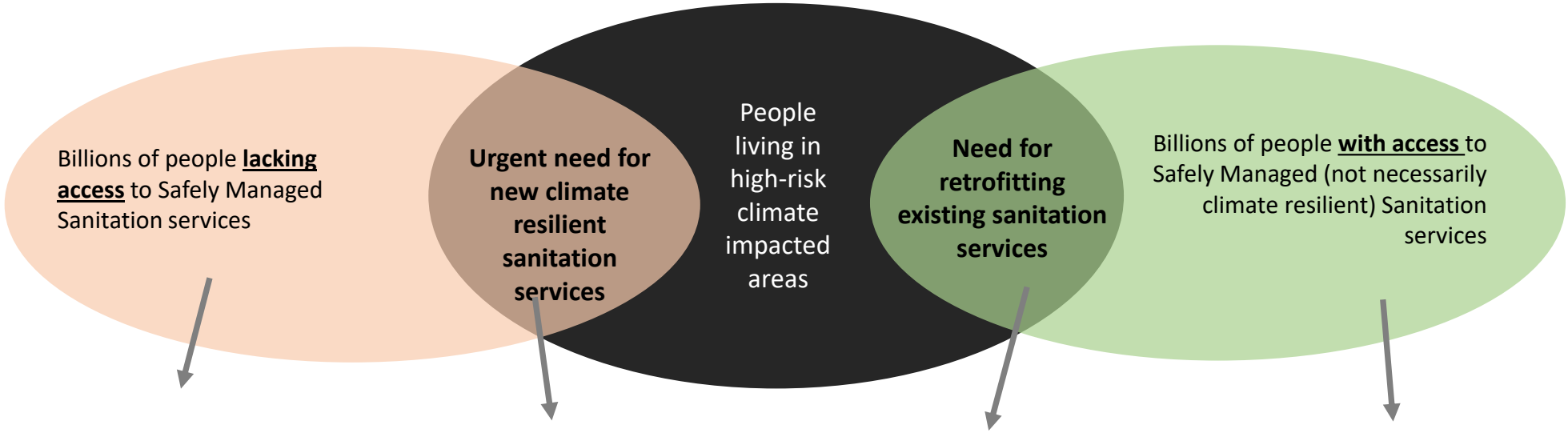
- Action for Water Adaptation and Resilience (AWARE Initiative @CoP27)
- Water Day
- Water Pavilion

Water Pavilion
Water for Climate

COP27
SHARM EL-SHEIKH
EGYPT 2022

Sanitation Climate Financing Asks

Who lives in the overlaps and how much does it cost to address the sanitation needs marked?



Climate financing to build capacity and improve governance to develop climate resilient sanitation services that contribute to build long term resilience and reduce GHG emissions

Climate financing for the provision of new and resilient sanitation services to reduce vulnerability and build adaptive capacity

Climate financing for upgrading existing and highly exposed sanitation systems

Climate financing to ensure water conservation, efficiency, and reuse, and to build longer-term sanitation resilience through strengthened and improved sanitation systems, including governance

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Get ready for 45 min **Speed Launches**

SW Sanitation Workers Knowledge and Learning Hub

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Sanitation Workers Knowledge and Learning Hub

Kanika Singh (Initiative for Sanitation Workers)

Sanitation Workers Knowledge and Learning Hub

32nd Virtual SuSanA meeting
22 August 2022

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The Humanitarian Sanitation Knowledge Hub (SaniHub) Project

Thorsten Reckerzügl (GTO)

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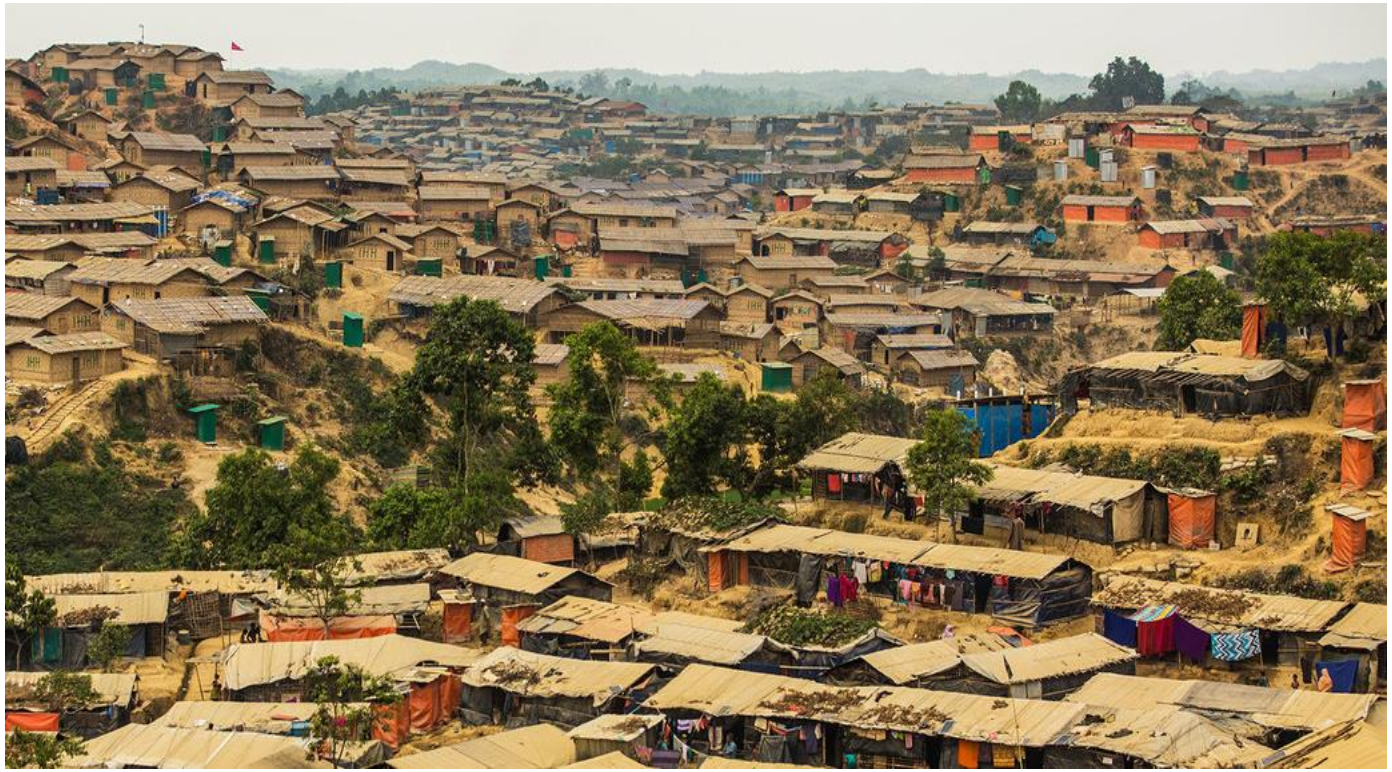
Why another knowledge platform?



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Aim and scope of the SaniHub project

- Development of a comprehensive, well-structured, continuously curated and moderated open knowledge and exchange platform
- A single meta platform that serves as information source and reference guide for all those involved in planning and implementing sanitation and FSM projects
- It includes an actively operated helpdesk to provide tailored, context-specific support
- A community of practice will be created for regular exchange and which will be involved into the Hub development

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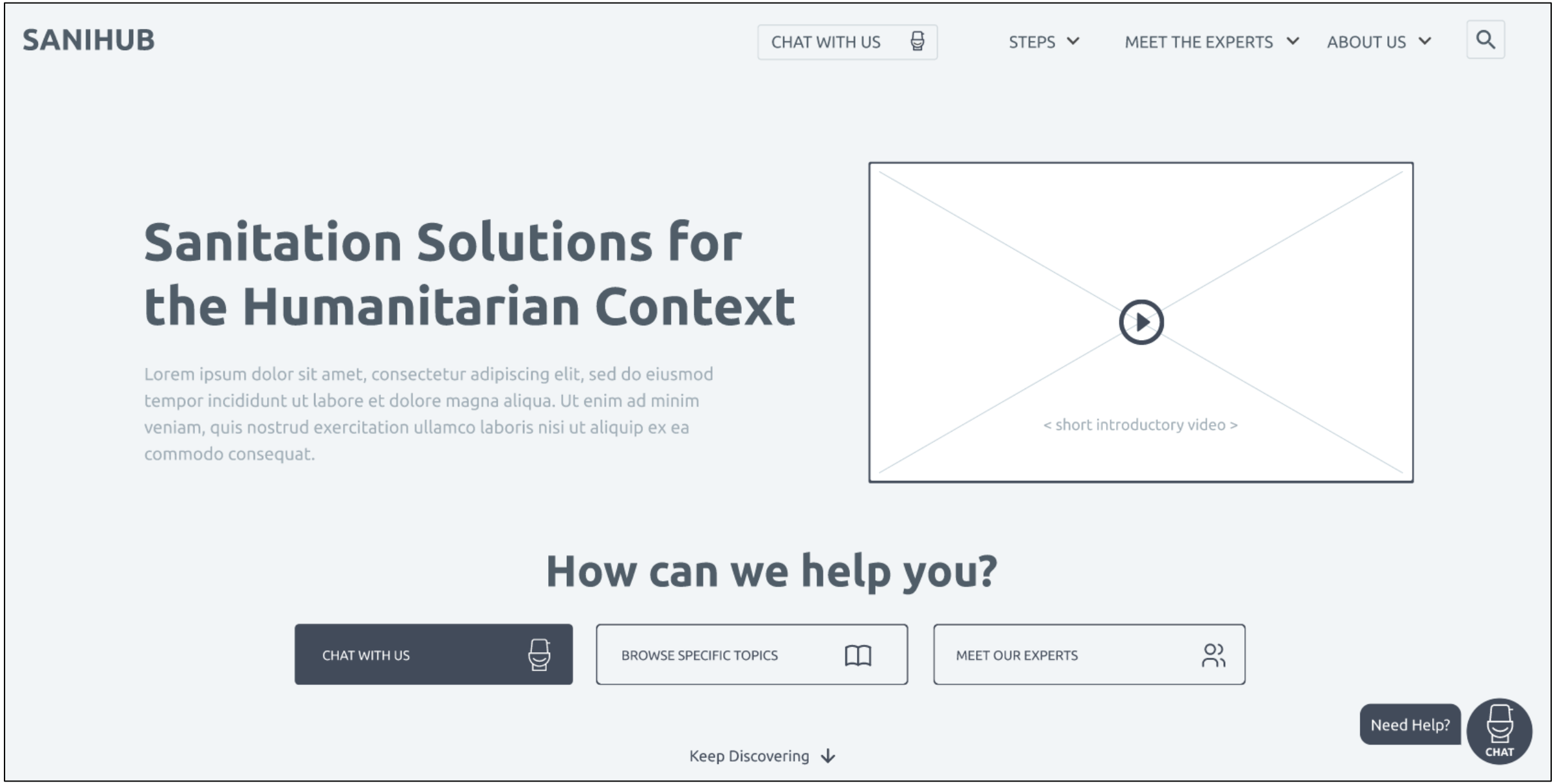
Project status



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Implementing partners

Project Partners	German Toilet Organization	eawag aquatic research	The Netherlands Red Cross	BORDA
	UNESCO IHE DELFT	CAWST	solidarités international	
Financially supported by	BILL & MELINDA GATES foundation			

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You want to be actively involved?

SaniHub mailing list:

https://sani-hub.us14.list-manage.com/subscribe?u=db4d25dd3caf4bd1a7513f0eb&id=1ce820d524

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SFD Portal Updates

Andy Peal (SFD PI)

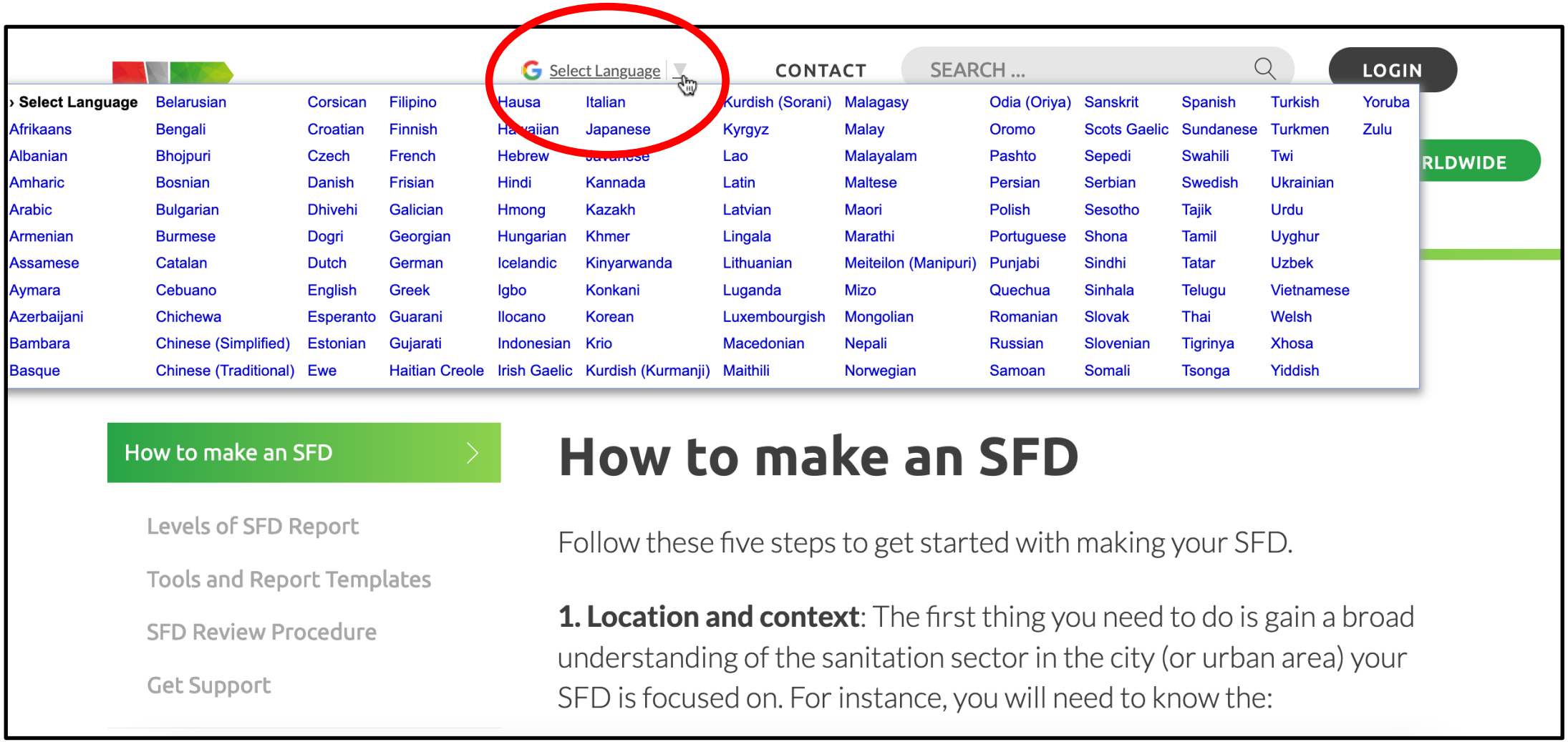
SFD web portal updates

- Now includes **SFD reports** and **data** on **224 cities** in **31 countries**
- ***NEW*** Translation feature – web portal available in 130 languages
- ***NEW*** Sanitation system drawings on SFD graphic generator page

For more information visit:

www.sfd.susana.org

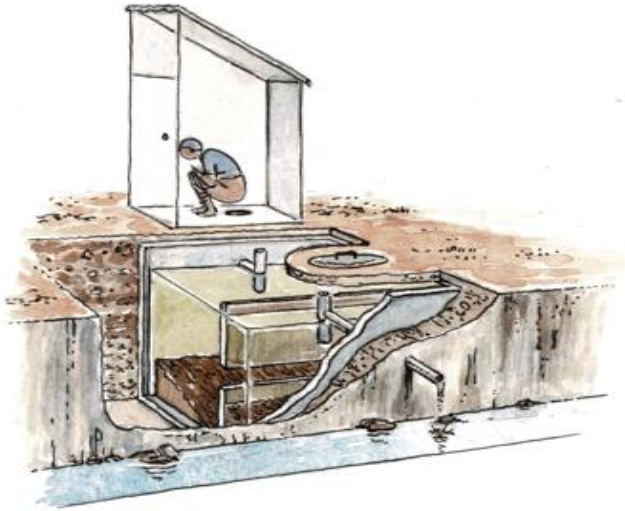
SFD web portal updates



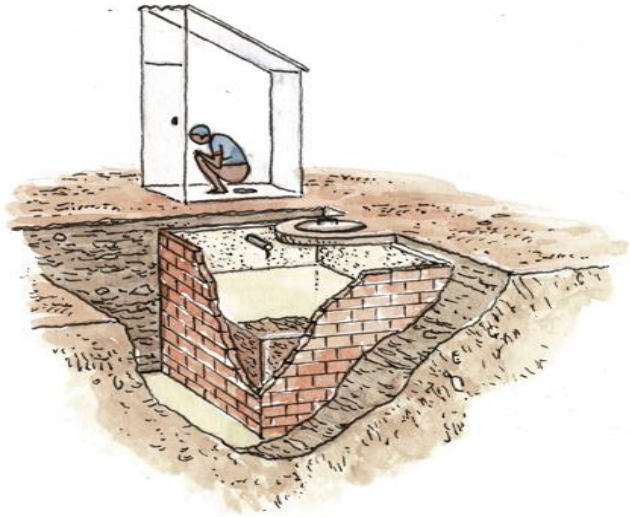
SFD web portal updates

SFD web portal updates

NEW sanitation system drawings on SFD graphic generator



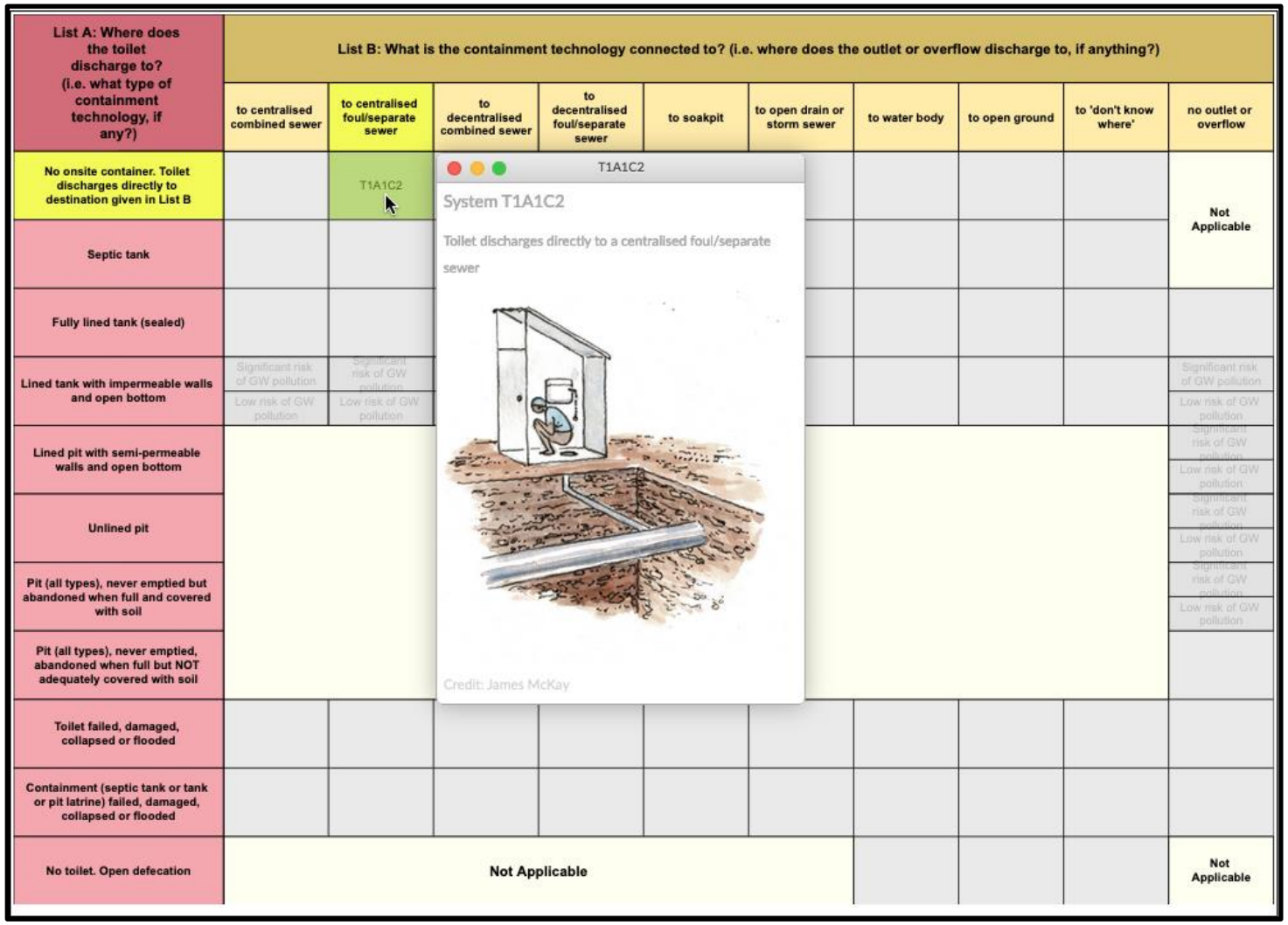
Septic tank connected to open drain or storm sewer



Fully lined tank (sealed), no outlet or overflow

SFD web portal updates

Sanitation system drawings on SFD graphic generator



Thank you!

Please visit
www.sfd.susana.org

SFD Promotion Initiative

Economic and Social Commission for Western Asia

Emersan Compendium in Arabic
From Knowledge to Impact

32nd SuSanA Meeting - online 22nd of August 2022

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ESCWA

Shared Prosperity Dignified Life

Kareem Hassan
Executive Director
UN-ESCWA Technology Centre

01 TRANSLATION AND LOCALIZATION

02 BUSINESS MODELS GENERATION

03 CAPACITY BUILDING

04 DIGITAL TOOLS FOR INNOVATORS

05 NETWORKING AND SCALING UP

Translation of the Compendium

القدرات ودعم اتخاذ القرار بما يتيح عملية الترشيح الآني لحلول سلسلة خدمات الصرف الصحي

الكتاب الإلكتروني لتقنيات الصرف الصحي في حالات الطوارئ هو أداة شاملة ومنهجية ومُنَظَّمة جيدًا على شبكة الإنترنت لبناءكاملةً و تكوينها من عناصرها في الوقت الحقيقي في بيئات الطوارئ. فالكتاب يقدم معلومات تفصيلية عن المعايير الأساسية في اتخاذ القرار لجميع تقنيات الصرف الصحي المُجرّبة والمختبرة الخاصة بالطوارئ، كما يقدم معلومات عن المسائل الشاملة والمُتشعّبة وكذلك عن دراسات الحالة المتاحة ذات الصلة؛ وذلك للخروج بقرارات واعية ومستنيرة بشأن تقنية الصرف الصحي في حالات

تعرّف على كيفية عمل الكتاب | ابدأ الآن

أداة لدعم اتخاذ القرار

الكتاب الإلكتروني لتقنيات الصرف الصحي في حالات الطوارئ هو تجميع مُنظَّم ومنهجي لكل تقنيات الصرف الصحي المعنية بحالات الطوارئ. فهو يفصل سلسلة خدمات الصرف الصحي ويقسمها إلى مكوناتها الوظيفية، ويقدم تعريفات للمصطلحات الأساسية، كما يقدم معلومات موجزة ومُركَّزة عن المعايير الأساسية في اتخاذ القرار لمجموعة كبيرة ومتنوعة من تقنيات الصرف الصحي في حالات الطوارئ وما يتعلق بها من قضايا ذات الصلة. وهو ييسر السبيل لاتخاذ القرارات الواعية المستنيرة عن طريق تقديم الإطار اللازم لتحديد مزيج التقنيات المجمعة الملائمة لسياق معين، ولتكوين حلول سلسلة خدمات الصرف الصحي كاملة: بدءًا من المراحاض، ومرورًا بالتجميع والنقل والمعالجة، ووصولاً للتخلُص الآمن وإعادة الاستخدام.

التكوين في الوقت الحقيقي والمشاركة الآنية

يتيح الكتاب الإلكتروني إمكانية ترشيح التقنيات على نحو موجه ومحدد وفقًا للسياق، كما يتيح إمكانية تكوين حلول سلسلة خدمات الصرف الصحي كاملة من عناصرها في الوقت الحقيقي. هذا إلى جانب سهولة مشاركة جميع التكوينات الفردية التي شُكِّلت عند استخدام خيارات الترشيح المتاحة وأداة التكوين مع الزملاء المهتمين وغيرهم من الممارسين في مجال الصرف الصحي. ويمكن الاختيار الأوّلي لمعلومات التقنية المعنية وللقضايا ذات الصلة، ومشاركة هذه المعلومات والمسائل أو إخضاعها لمزيد من المناقشة مع أي مجتمع من مجتمعات خبراء الصرف الصحي وممارسيه على شبكة الإنترنت.

من الإغاثة إلى التنمية

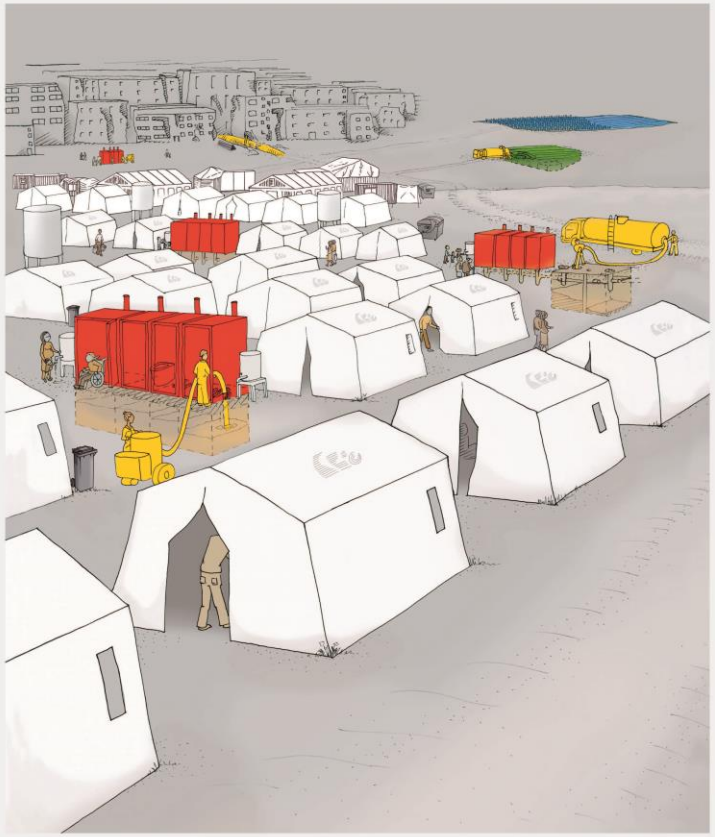
ويتناول الكتاب الإلكتروني مجموعة كبيرة من السيناريوهات المُختَلفة التي قد يواجهها المُمارِسون في مجال المياه والصرف الصحي والنظافة الصحية (WASH) في العمل الإنساني عند التخطيط لخدمات الصرف الصحي الملائمة، وتنفيذها، وتشغيلها، وذلك باشتماله على التقنيات المناسبة وتغطيتها، بدءًا من الاستجابة الحادة وعبورًا بمرحلة الاستقرار حتى يصل إلى مرحلة الانتعاش.

الجمهور المُستهدَف

يستهدف الكتاب الإلكتروني بالأساس العاملين في ميدان العمل الإنساني، وفِرَق الاستجابة الأوليّة المحليّة، والمهندسين، وخبراء التخطيط، ومُنشئي الحكومة، والمؤسسات الأكاديمية، والوكالات العاملة في مجال بناء القدرات، والمتخصصين المهنيين في مجال المياه والصرف الصحي والنظافة الصحية (WASH) ممن لهم دور في الاستجابة الإنسانية الخاصة بالمياه والصرف الصحي والنظافة الصحية

تقنيات الصرف الصحى فى حالات الطوارئ

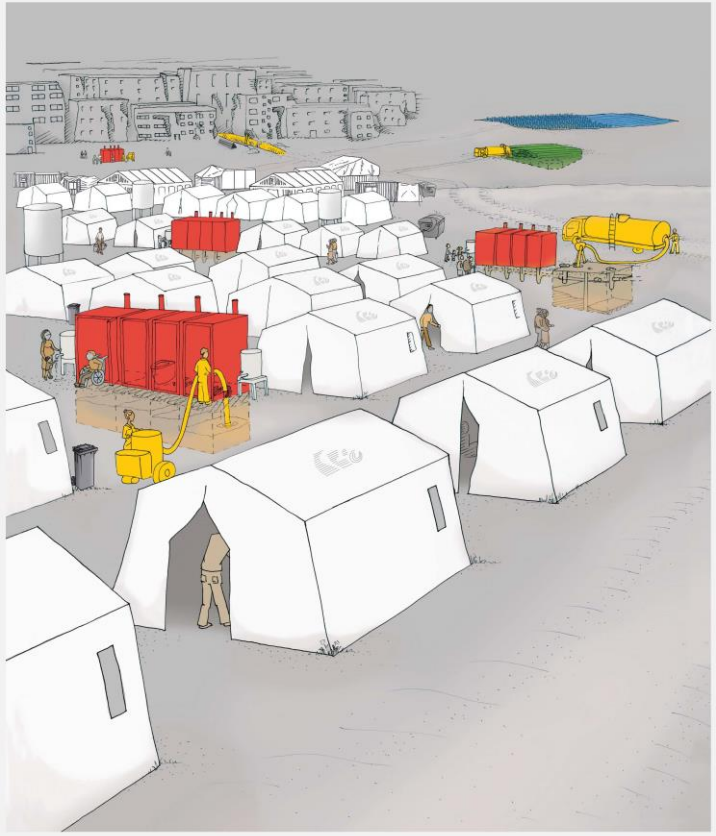
الطبعة الأولى



GERMAN WASH NETWORK | eawag aquatic research | WASH Cluster Water Sanitation Hygiene | sustainable sanitation alliance

Compendium of Sanitation Technologies in Emergencies

1st Edition

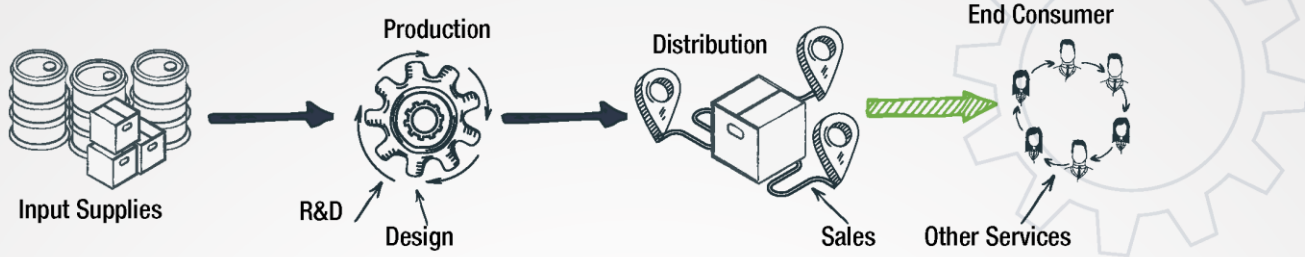


GERMAN WASH NETWORK | eawag aquatic research | WASH Cluster Water Sanitation Hygiene | sustainable sanitation alliance

Business Models Generation

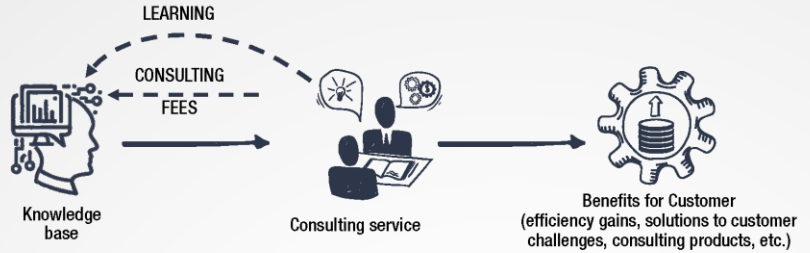
MANUFACTURING BUSINESS MODEL

VALUE CREATION PROCESS



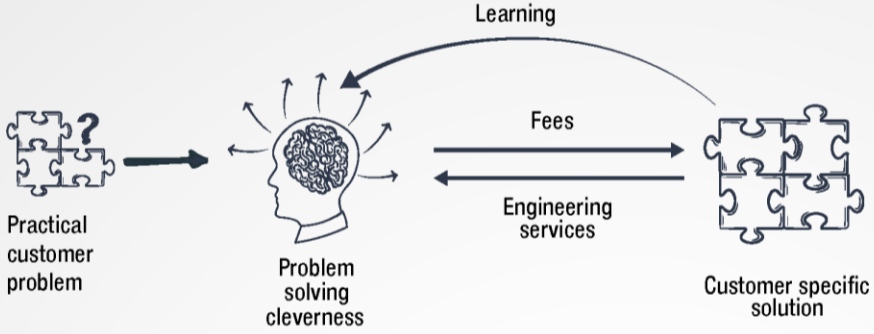
CONSULTING BUSINESS MODEL

VALUE CREATION PROCESS



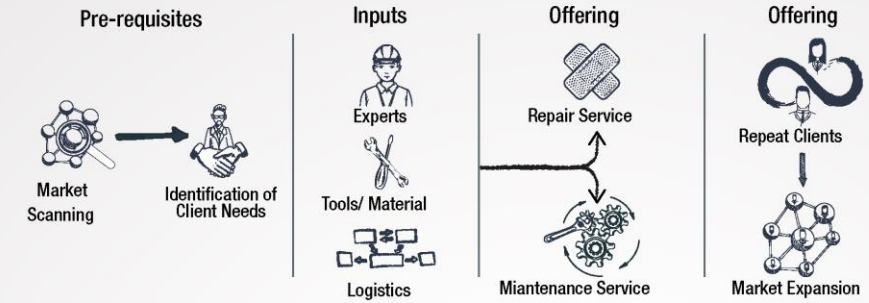
ENGINEERING SERVICES BUSINESS MODEL

VALUE CREATION PROCESS



MAINTENANCE & REPAIR SERVICES BUSINESS MODEL

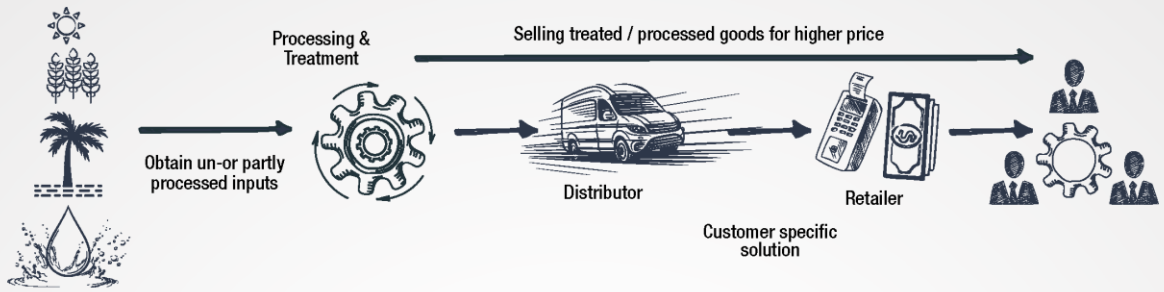
VALUE CREATION PROCESS



PROCESSING & TREATMENT BUSINESS MODEL

Shared Prosperity Dignified Life

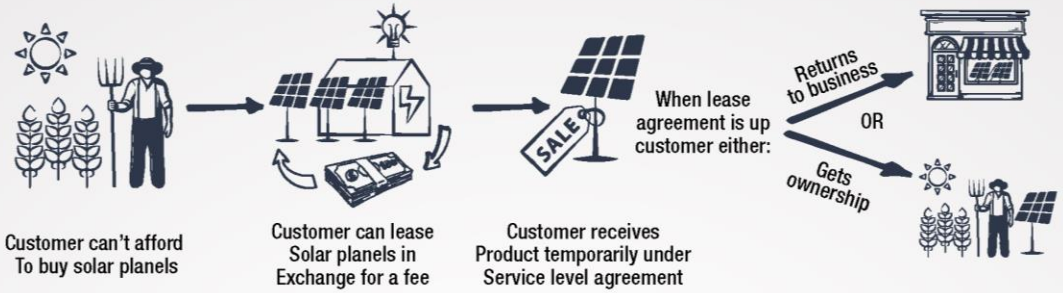
VALUE CREATION PROCESS



SYSTEM LEASING & RENTAL BUSINESS MODEL

Shared Prosperity Dignified Life

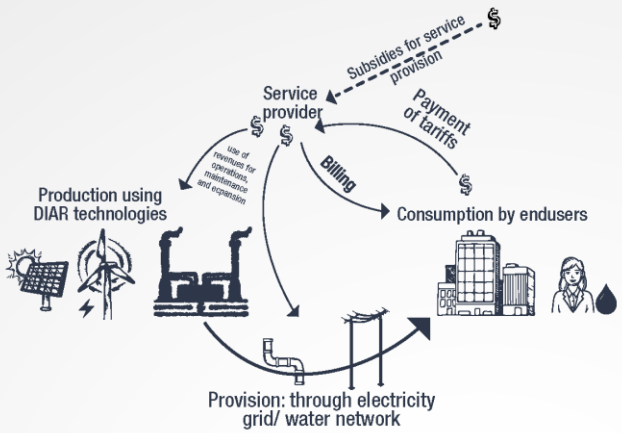
VALUE CREATION PROCESS - EXAMPLE

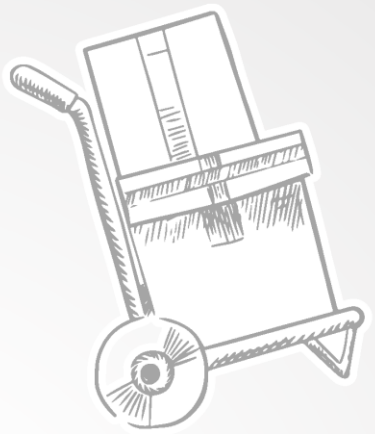


SERVICE PROVIDER BUSINESS MODEL

Shared Prosperity Dignified Life

VALUE CREATION PROCESS





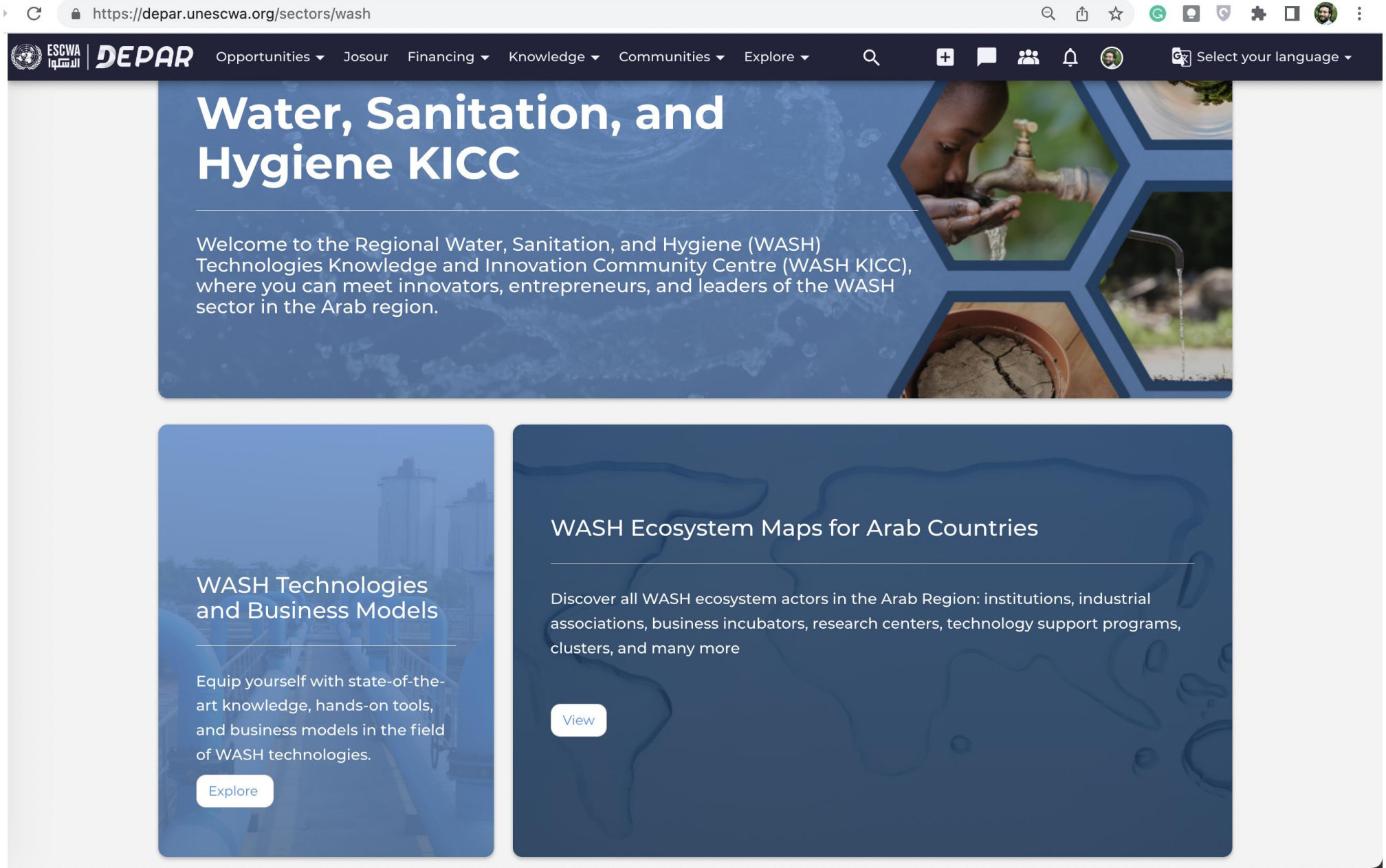
RETAIL & SALES BUSINESS MODEL

Shared Prosperity Dignified Life

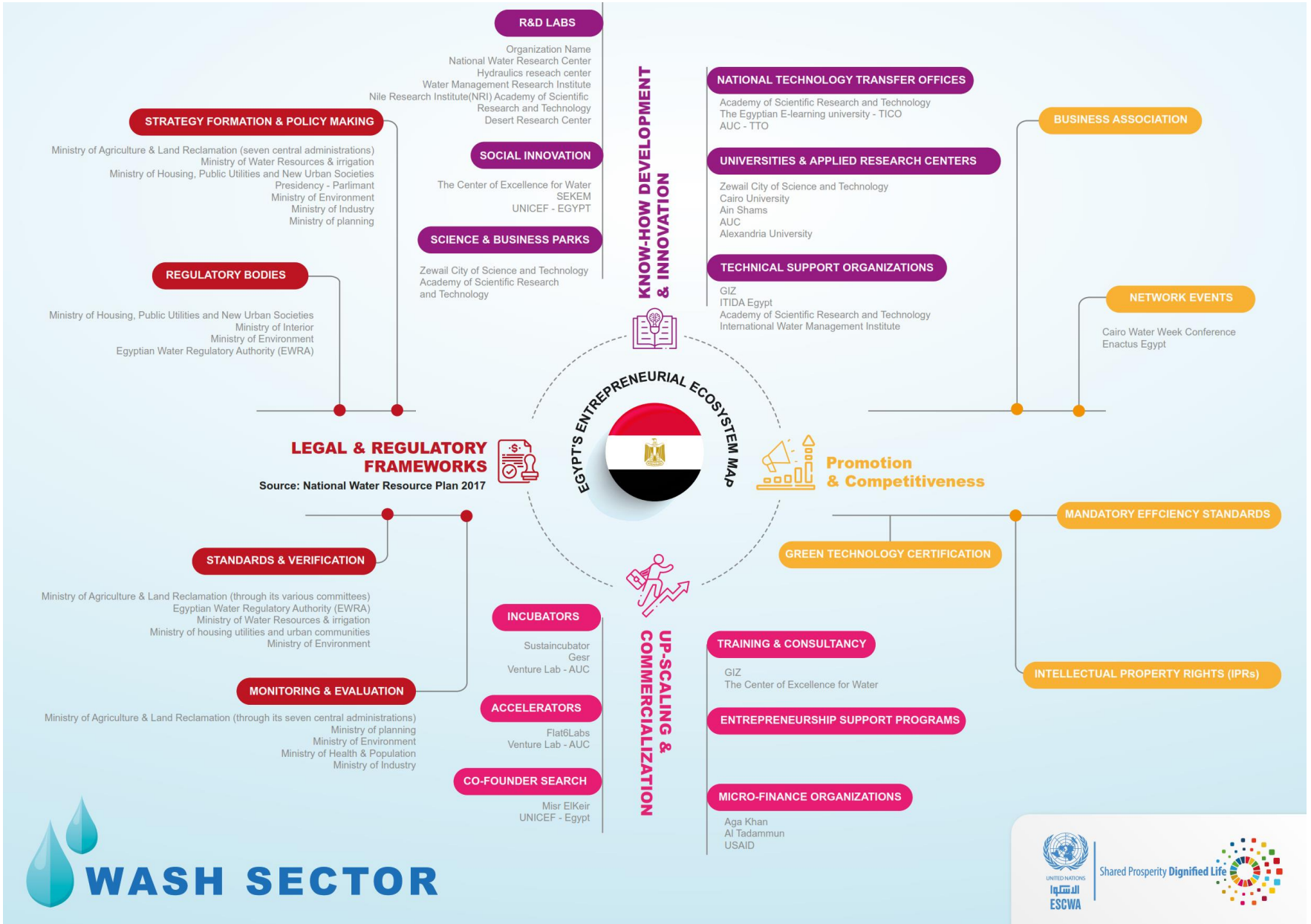
VALUE CREATION PROCESS

Training and Capacity Building

Digital Tools for Innovators



Digital Tools for Innovators



Networking and Scaling Up:
The Arab SMEs Summit _ October 30, 2022

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Shared Prosperity Dignified Life

Thank You!

Kareem Hassan
Email: kareem.hassan@un.org

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Compendium of Hygiene Promotion in Emergencies

Robert Gensch (GTO)

Compendium of Hygiene Promotion in Emergencies

32nd SuSanA Meeting | August 22, 2022

GERMAN WASH NETWORK

IFRC

WASH Cluster Water Sanitation Hygiene

sustainable sanitation alliance

Multi Agency Publication

Developed by

GERMAN WASH NETWORK

IFRC

WASH Cluster Water Sanitation Hygiene

sustainable sanitation alliance

Supported by

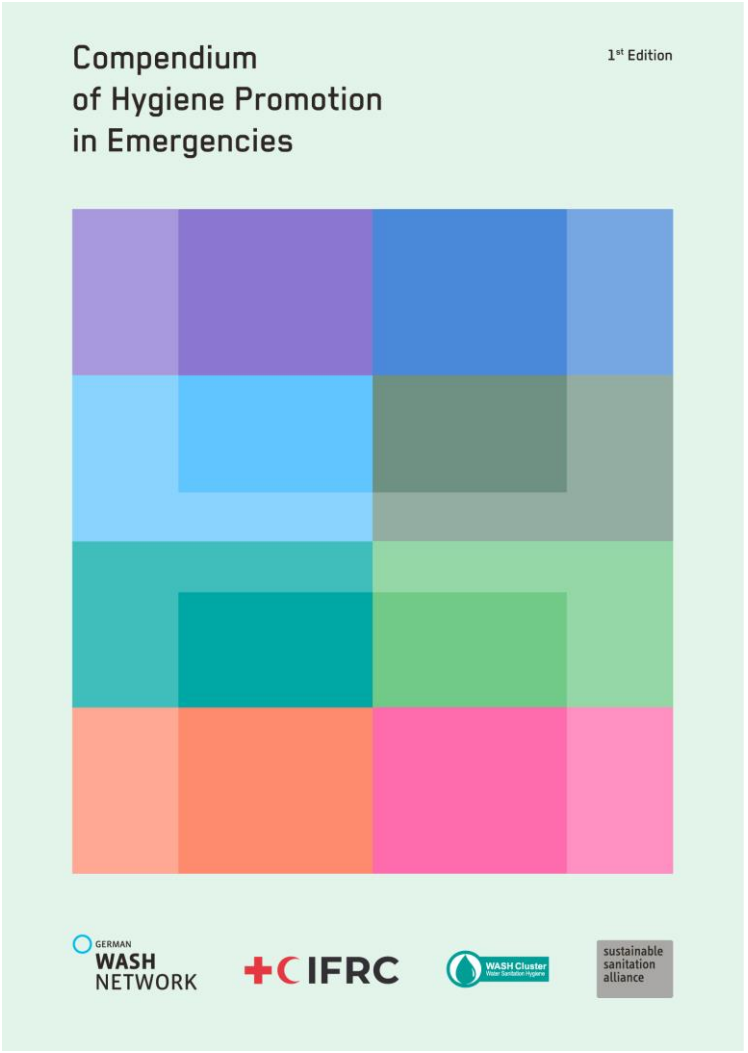
german humanitarian assistance
DEUTSCHE HUMANITÄRE HILFE

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

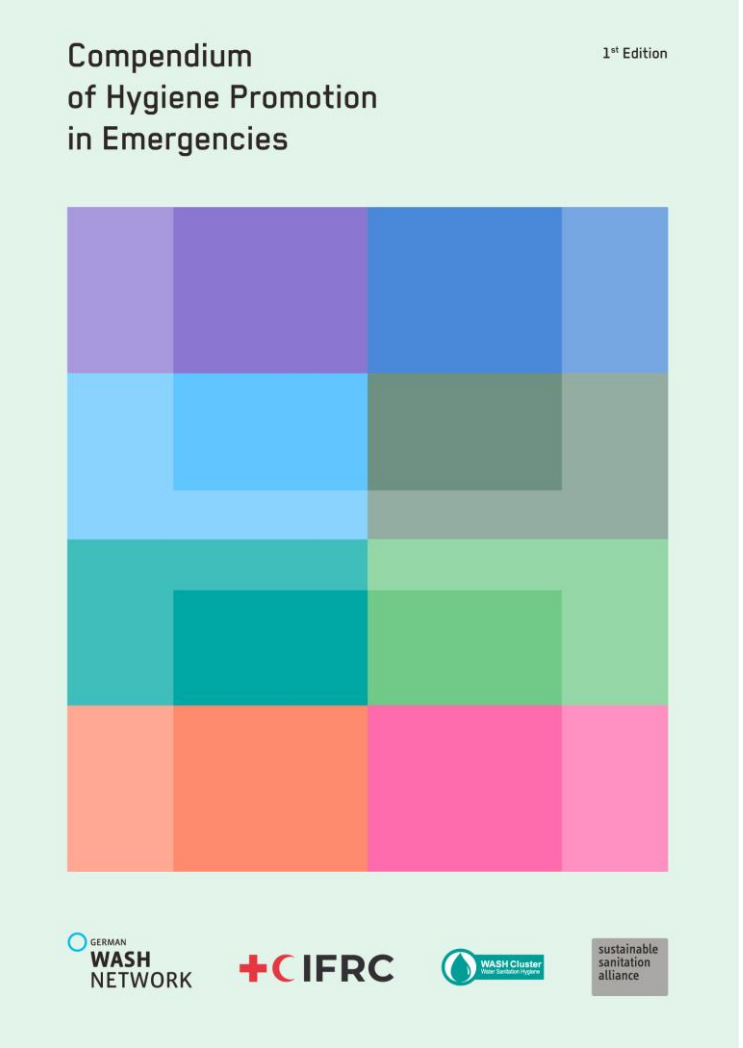
With Contributions from

More than 100 sector experts from around 50 organisations, institutions and networks



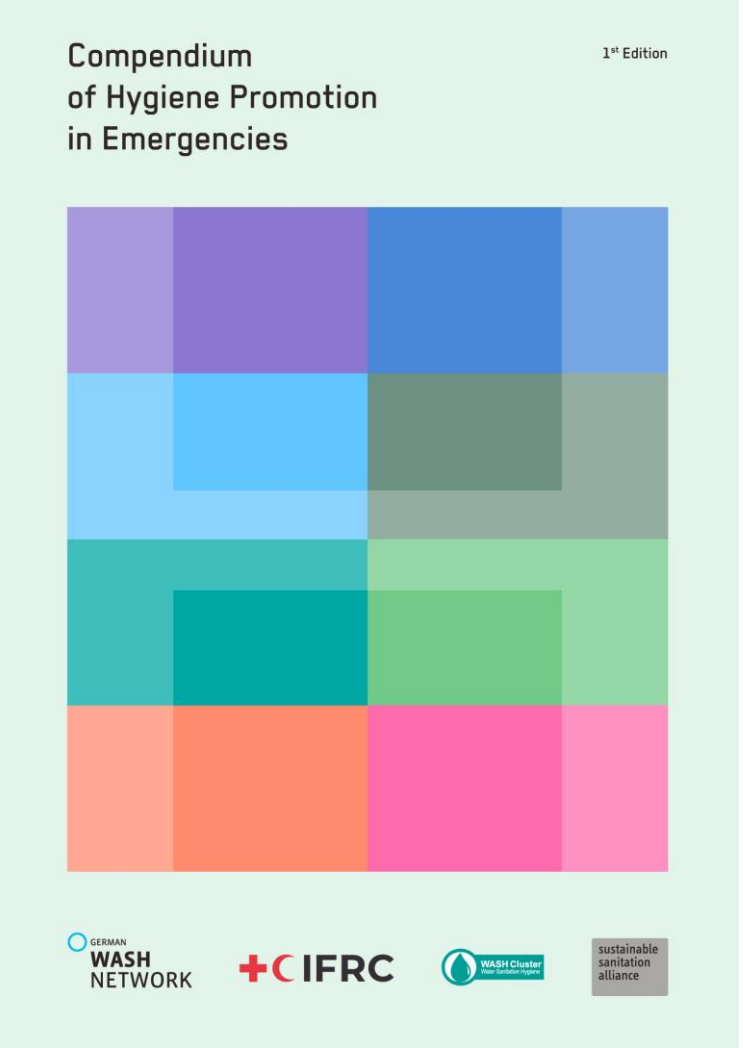
Overview

- 3rd volume of the ‘Emergency WASH Compendium’ series
- Comprehensive compilation and categorisation of most relevant HP components, tools, methods and approaches
- Applicable to all critical hygiene behaviours across all response phases
- Expert peer-reviewed (>100 individuals involved)

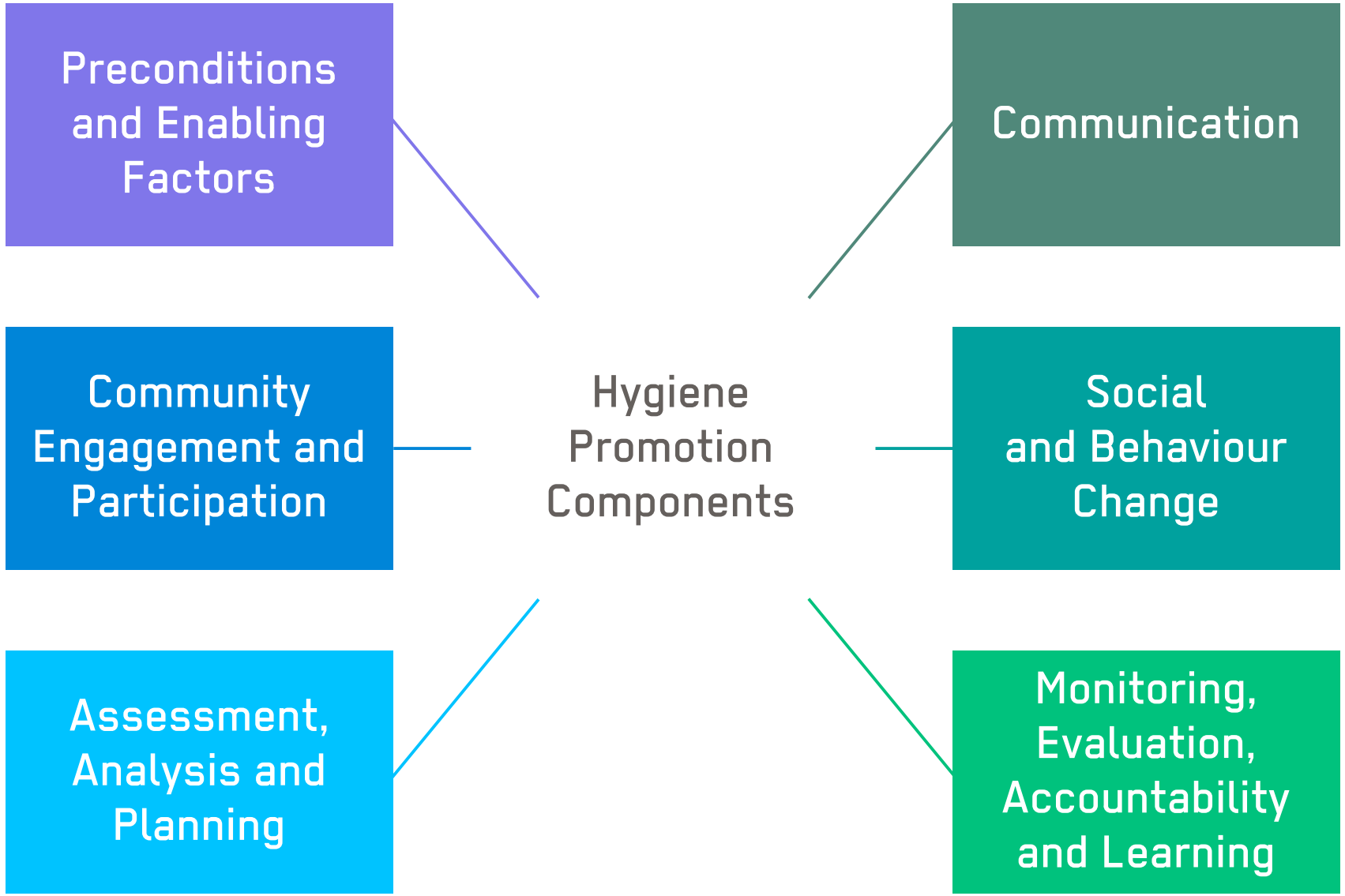


Overview

- Development of common language: clarity on terms and vocabulary used
- Disaggregation into functional components
- Systematic starting point and reference guide to access available HP information, key concepts and good practice
- Capacity strengthening and decision support tool



HP Components



Structure | HP Components

HYGIENE PROMOTION COMPONENTS

P — Preconditions and Enabling Factors

P.1	Key Concepts and Good Practice
P.2	Access to Handwashing Facilities
P.3	Access to Water Supply Facilities
P.4	Access to Sanitation Facilities
P.5	Access to SWM, HCWM and Vector Control
P.6	Access to Hygiene Items
P.7	Menstrual Health and Hygiene (MHH)
P.8	Market- Based Programming (MBP)
P.9	Coordination and Collaboration with Other WASH Stakeholders and Sectors
P.10	Advocacy for WASH and Community Priorities

E — Community Engagement and Participation

E.1	Key Concepts and Good Practice
E.2	Levels of Engagement and Participation
E.3	Gender Issues
E.4	Working with Babies, Children and Young People
E.5	Working with People with Disabilities and Older people
E.6	Hygiene Promotion in Schools
E.7	Ownership and Management of Facilities
E.8	Hygiene Promotion in Institutions and other Settings
E.9	Community Capacity Strengthening
E.10	Community Engagement at a Distance

A — Assessment, Analysis and Planning

A.1	Key Concepts and Good Practice
A.2	Risks and Influences affecting Health and Hygiene
A.3	Assessment Process and Planning
A.4	Data Collection Methods and Analysis
A.5	Assessment Content and Scope
A.6	Existing Capacity
A.7	Community Profile
A.8	Conducting Quantitative Surveys
A.9	Planning

C — Communication

C.1	Key Concepts and Good Practice
C.2	Communication Skills
C.3	Audience Profile and Inclusive Communication
C.4	Participatory Communication
C.5	Mass Communication
C.6	Community Perspectives and Rumours
C.7	Language and Cultural Considerations
C.8	Remote Communication
C.9	Risk Communication and Community Engagement (RCCE)
C.10	Communication Plan

B — Social and Behaviour Change

B.1	Key Concepts and Good Practice
B.2	Behaviour Change Models and Theories
B.3	Motivators and Barriers: Knowledge
B.4	Motivators and Barriers: Ability and Self Efficacy
B.5	Motivators and Barriers: Motivation, Attitudes and Beliefs
B.6	Motivators and Barriers: Social Influence, Norms and Group Affiliation
B.7	Motivators and Barriers: Cues and Habit Formation
B.8	Overview of Behaviour Change Approaches

M — Monitoring, Evaluation, Accountability and Learning

M.1	Key Concepts and Good Practice
M.2	Monitoring
M.3	Evaluation
M.4	Accountability
M.5	Participatory Monitoring, Evaluation, Accountability and Learning (MEAL)
M.6	Learning: Process and Key Elements
M.7	Learning: Research and Evidence
M.8	Learning: Knowledge Management

TOOLS / METHODS

T.1	Accessibility and Safety Audit
T.2	Assessment Checklist
T.3	Barrier and Motivator Analysis
T.4	Beautification
T.5	Care Groups
T.6	Community Drama, Cinema and Puppets
T.7	Community Mapping
T.8	Competition
T.9	Cues and Nudges
T.10	Demonstration, Show and Tell
T.11	Events
T.12	Exchange Visit
T.13	Feedback Mechanism
T.14	Focus Group Discussion (FGD)
T.15	Games and Toys
T.16	Gender Analysis
T.17	Health Surveillance Data
T.18	Household Visit
T.19	Information, Education and Communication (IEC)
T.20	Institutional Checklist
T.21	Integrated Behavioural Model (IBM) for WASH
T.22	Involvement of Local Champions
T.23	Key Informant Interview
T.24	Knowledge, Attitude and Practice (KAP) Survey
T.25	Logical Framework Analysis and Problem Tree
T.26	Most Significant Change (MSC)
T.27	Motivational Interviewing
T.28	Observation
T.29	Peer Education (Child- to- Child)
T.30	Photo Voice and Participatory Video
T.31	Pocket Chart Voting
T.32	Positive Deviancy and Doer / Non-Doer Analysis
T.33	Print Media
T.34	Proportional Piling
T.35	Protection Mainstreaming
T.36	Public Announcement
T.37	Public Commitment
T.38	Radio and Television (TV)
T.39	Ranking
T.40	Rewards and Incentives
T.41	Role Play
T.42	Routine Planning and Self Regulation
T.43	Seasonal Calendar
T.44	Social Media and Text Messaging
T.45	Social Norms and the Use of Shame and Disgust
T.46	Social Support
T.47	Songs and Stories
T.48	Spidergram
T.49	Stakeholder Mapping
T.50	Supervised Handwashing
T.51	Three- Pile Sorting
T.52	Transect Walk
T.53	Transmission Routes and Barriers (F- Diagram)
T.54	Venn Diagram
T.55	WASH Committee

FRAMEWORK / APPROACHES

Approaches with Focus on Participatory Sanitation and/or Hygiene

F.1	Community Health Clubs (CHC)
F.2	Community- Led Total Sanitation (CLTS)
F.3	Emergency Community Health Clubs (eCHC)
F.4	IFRC's 8 Steps for Hygiene Promotion in Emergencies
F.5	Mum's Magic Hands (MMH)
F.6	Participatory Hygiene and Sanitation Transformation (PHAST)
F.7	Sani Tweaks

Approaches mainly Targeting Children and Schools

F.8	Blue Schools
F.9	Children's Hygiene and Sanitation Training (CHAST)
F.10	Fit for School (FIT)
F.11	Three Star Approach (TSA)
F.12	Toilets Making the Grade (TMG)

Approaches mainly Targeting Women and Girls

F.13	Baby WASH
F.14	IFRC's 8 Steps for Menstrual Hygiene Management (MHM) Action
F.15	WASH Social Architecture

Approaches based on Behavioural Science

F.16	Approach Focused on Behavioural Determinants (ABCD)
F.17	Behaviour Centred Design (BCD)
F.18	Communication for Behavioural Impact (COMBI)
F.19	FOAM and SaniFOAM
F.20	Risks, Attitudes, Norms, Ability and Self- Regulation (RANAS)
F.21	Sanitation and Social Marketing
F.22	Wash'Em

Approaches targeting Participation and Accountability

F.23	Accountability to Affected Population (AAP)
F.24	Community Perception Tracking (CPT)

Emergency WASH Portal | Online Platform

Sanitation Technologies in Emergencies

EN | FR | AR | UKR

Water Supply Technologies in Emergencies

EN | FR | UKR

Hygiene Promotion in Emergencies

EN | FR | UKR (soon)

www.emergency-wash.org

sustainable sanitation alliance

Handwashing Facilities - Overview and Decision Support Tool with Case Studies from Uganda (GIZ, FNHW, Eawag)

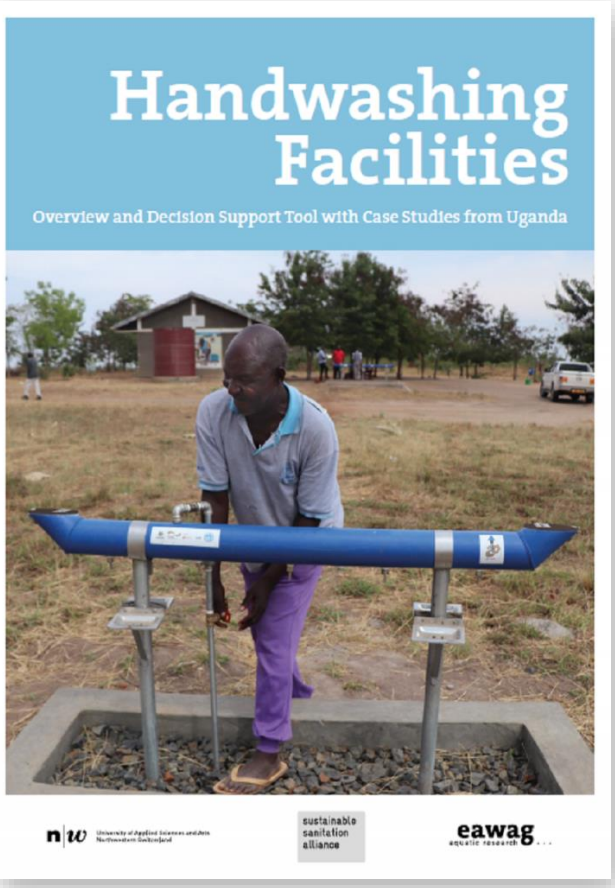
Maryna Peter (FHNW), Swaib Semiyaga (Makerere University)

University of Applied Sciences and Arts Northwestern Switzerland

MAKERERE UNIVERSITY

A step towards well-informed WASH planning

Target: Enabling **universal access** to handwashing facilities, particularly in public and commercial places and buildings



- **A comprehensive overview** on handwashing facilities worldwide
- **A systematic guidance** on “how to select” and “what to consider” during the decision-making process
- **A set of examples** in practice fit into the planning framework;
- **A living document**, open to more input and update.

https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/4460#

Handwashing facilities: overview

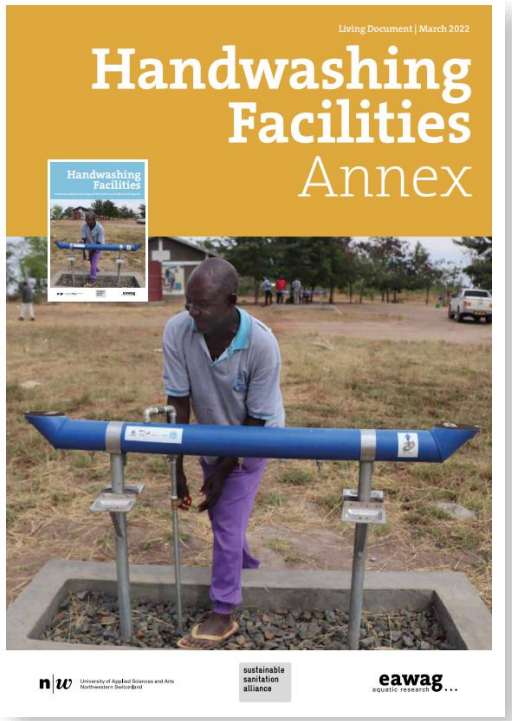
Part 1: Handwashing facilities Key aspects

Scale and intended use	Water supply
Type of installation	Greywater management and drainage
User interface	Technical specifications

Part 2: Handwashing facilities Selection of suitable systems

- Step 1 Characterizing context and developing scenarios
- Step 2 Screening of options
- Step 5 Exploring options for scaling up
- Step 4 Prioritizing options
- Step 3 Indentifying possible facilities

Handwashing facilities: Annex



- Set of examples from different contexts
- Commercial and non-profit facilities
- Continously updated «living document»

→ Please submit your handwashing facility to info@susana.org

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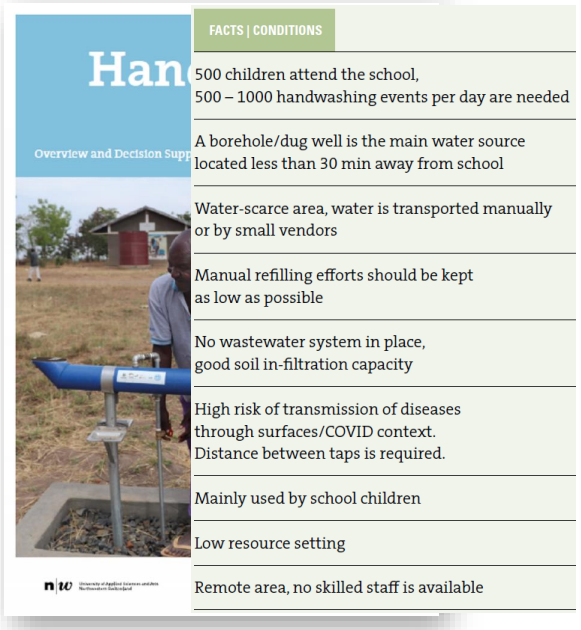
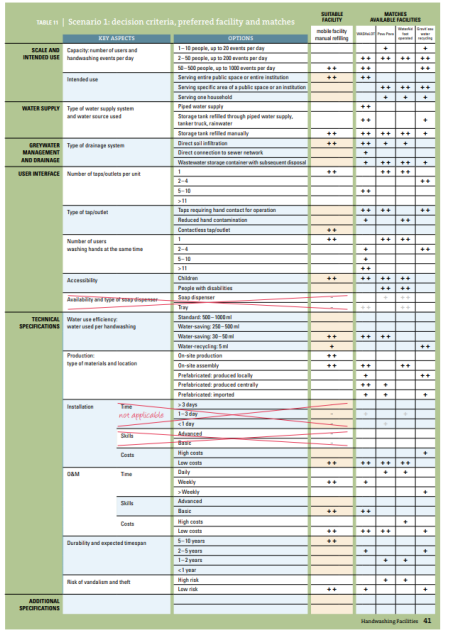
Case studies in Uganda: step-wise decision making

① Context characterisation

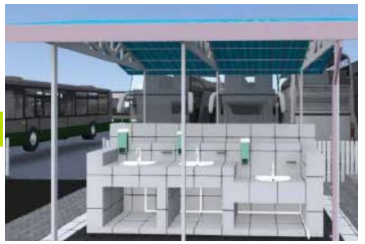
Facts / conditions



② Screening of options



③ Identify appropriate facilities



④ Prioritise options:

- User acceptance
- Pilot options

⑤ Scaling possibilities:

- Supply chain
- Management

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A Journey of Urban Sanitation in India

Susmita Sinha, Depinder Kapur, Arne Panesar, Rahul Sharma, V. Venugopal, Monika Bahl, Mintje Büürma, Annkathrin Tempel, Sebastian Köcke

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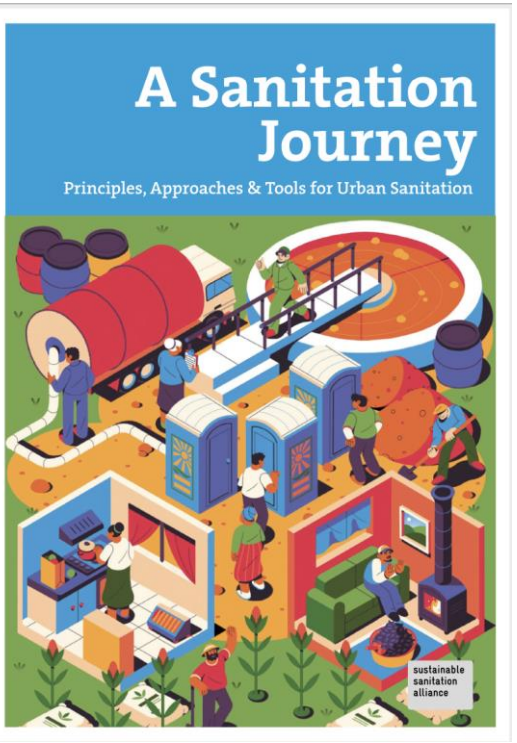
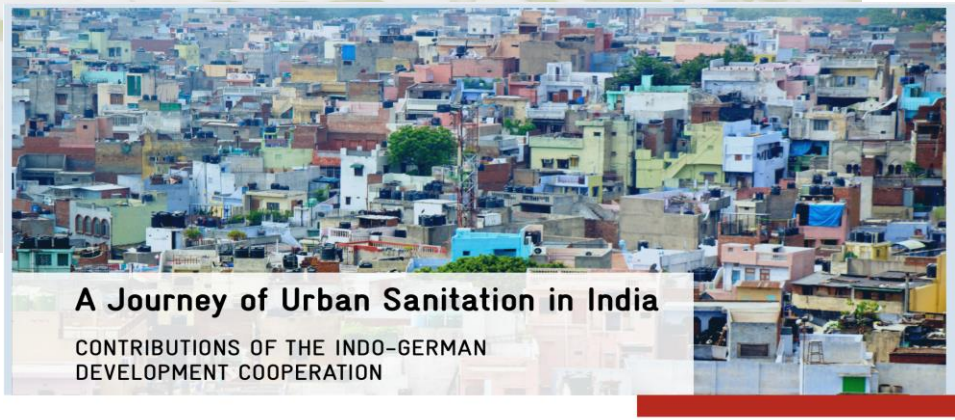
Documenting key milestones





SuSanA – Knowledge management

- https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/4432

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Startpage » Knowledge hub » Resources and publications

A Journey of Urban Sanitation in India - Contributions of the Indo-German Development Cooperation

Sinha, S., Kapur, D., Panesar, A., Sharma, R., Venugopal, V., Bahl, M., Büürma, M., Tempel, A., Köcke, S. (2022)

visit the library

Home | About | FAQ | Register | Contact | Login translate p

News & Events Knowledge Hub

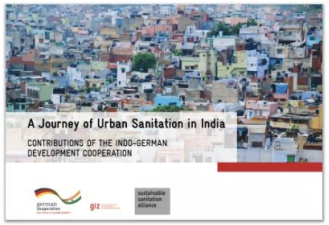
Selected Interventions - Policy Support

- Manual on Municipal Solid Waste Management - 2016, Government of India
- State Sanitation Strategy - Telangana, Andhra Pradesh and Kerala (Part 1)
- State Sanitation Strategy - Telangana, Andhra Pradesh and Kerala (Part 2)
- Handbook for Integrated wastewater and septage management for Urban Local Bodies in Telangana
- National Advisory on Public and Community Toilets, Government of India

Selected Interventions - Lighthouse Projects

- Waste to Energy Project, Nashik (Brochure and Leaflet)
- Waste to Energy Project, Nashik (Movie)
- Zero-waste Event, Odisha

download



Published in: 2022
Pages: 88

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My learnings

- "One size does not fit all"
- Sanitation is integral to urban development

Contents

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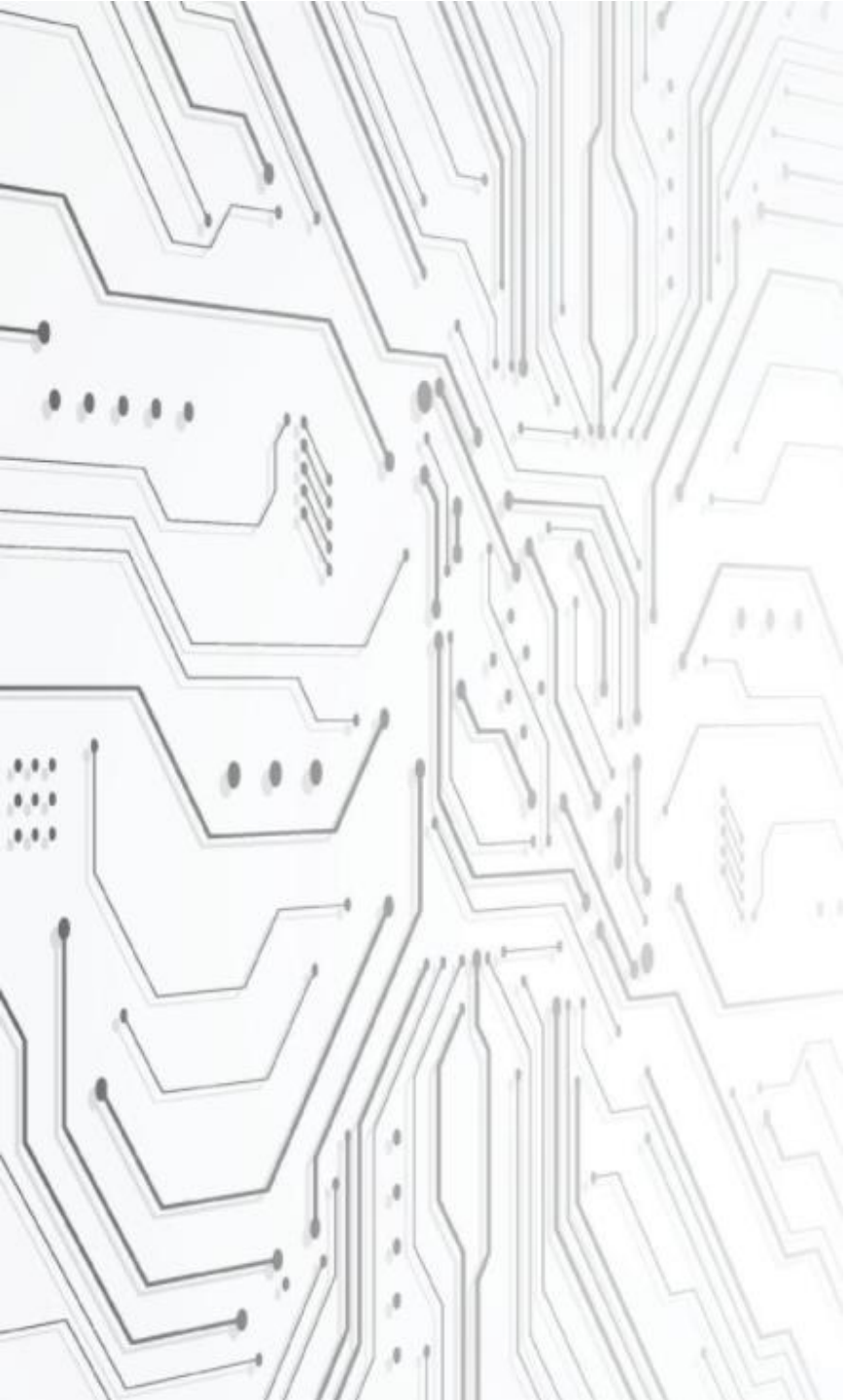
SuSanA partnership in the **WASH: +1 Global Fund**

Alexandra Dubois (GIZ)

+1 Global Fund

The Roddenberry Foundation

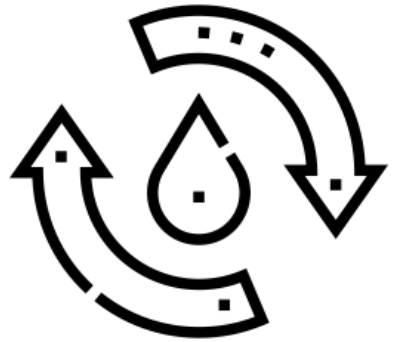


The +1 Global Fund accelerates social change by strengthening existing networks of high impact, community-based organizations in last-mile and vulnerable communities. The Fund leverages these networks to identify, invest in, and develop the capacity and collective impact of small, locally-led organizations across new, emergent ecosystems.

Water, Sanitation, and Hygiene (WASH)

No systems have been more burdened or exposed by the pandemic than those supporting WASH.

In too many countries, the fragility, fragmentation, and under-financing of WASH systems has rendered access to clean water or reliable sanitation inadequate or nonexistent.



In our response to this situation, we have a singular opportunity for real transformation, a shot to profoundly reimagine and reshape how we support WASH systems in the Global South.

The +1 Global Fund is a dual investment in organizations and networks of learning, sharing, growth, and collective action necessary to ensure resilience and long-term impact.

The Program

The +1 Global Fund is a network-based set of interlocking programs that activate existing networks and catalyze new, emergent one through:

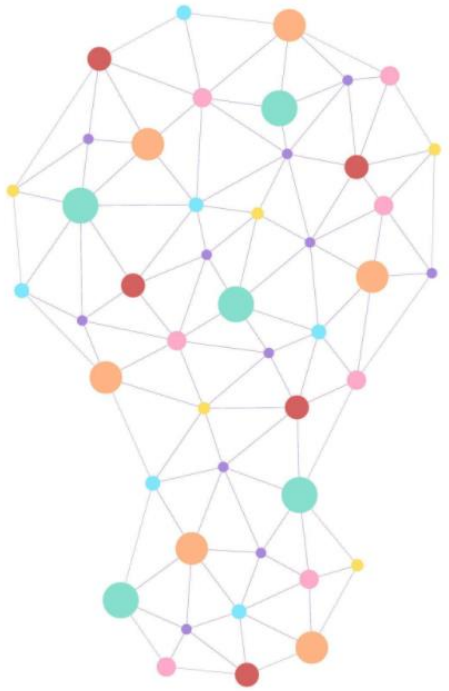
- **Catalytic funding**: A network-of-network funding model that leverages peer nominations to identify high performing, locally-led organizations in specific sectors. (Activate)
- **Community building:** A cohort-oriented accelerator program focused on organizational development, individual coaching, and peer-to-peer engagement. (Engage)
- **Network strengthening**: A multi-day hackathon that convenes all participants to learn, share, and collaborate. (Unite)
- **Access + promotion**: increased exposure and access to impact networks through partners and funders. (Inspire)

How it Works

The +1 Global Fund is organized into cycles, consisting of **five consecutive 12-week rounds**.

- ❏ We work with our funding partners to identify regions and issues within the WASH space in a targeted part of the Global South. To date, our focus has been on Sub-Saharan Africa.

- ❏ At the start of each round, **Network Partners**—globally-recognized organizations that have built extensive networks– identify leaders within their networks who nominate up to three high-performing organizations in their communities working within the target sector.

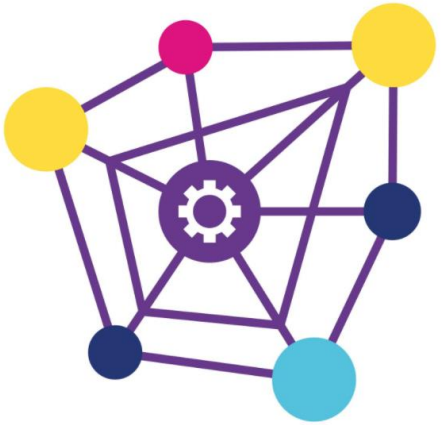


How it Works

- Nominees are invited to submit any existing documentation- videos, presentations, proposals, or media- that speaks to their impact and track record.

- In each round 15 nominees receive a “no-strings attached” $12,000 grant. If a Nominators’ nominee is selected, the Nominator is also compensated with a grant of $2,000.

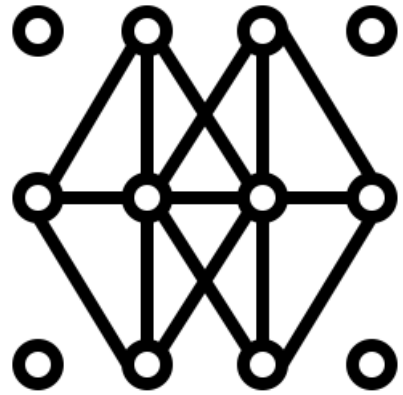
- All Awardees are invited to participate in a capacity building accelerator to strengthen their own capabilities and that of the networks. The 3-month accelerator focuses on round’s cohort and combines workshops, one-one coaching, and peer-led sessions.



WASH Network Partners

Participation

The ideal Network Partner is embedded within a network of proximate changemakers, and has enough knowledge of their work to be able to identify participants to play the role of nominator. As a Network Partner you will:



- Have an opportunity to channel philanthropic funds towards high-potential organizations most proximate to vulnerable communities.
- Be featured on the Roddenberry Foundation’s website and social media channels.
- Receive a detailed report with data we collect on all program participants (such as on who nominates whom and why, which Nominees were awarded +1 Fund support, etc.).
- Be invited to opportunities to connect and collaborate with +1 Awardees

A new model for a new era

We invite you to join our journey as we deploy a new, more inclusive way to identify and fund local organizations, and promote sustainable and adaptable solutions. Together, we can shift the power closer to the communities we serve, increase our efficiency and impact, and highlight exceptional solutions and actors who would otherwise remain invisible.

Lior Ipp
CEO
The Roddenberry Foundation
lior@roddenberryfoundation.org

sustainable sanitation alliance

FSM7 Conference in Abidjan (FSMA)

Jennifer Williams (FSMA)

When: 19-23 February 2023
Where: Sofitel Hotel Ivoire

21ème Congrès International & Exposition de l'Association Africaine de l'Eau

21st African Water Association International Congress & Exhibition

7èmeConférence Internationale sur la Gestion des Boues de Vidange.

7th International Faecal Sludge Management Conference

ABIDJAN 2023

Key Dates:

- Call for Papers Opens – Early Sept
- Registration Opens – End Sept
- Call for Papers Closes – Early Oct
- Authors Notified - Early Dec

Conference Theme

Theme: Responses for sustainable management of resources and universal access to water and sanitation

- Sub-Themes
  - Water Resources Management and Climate Change
  - Universal Access water
  - Access to sanitation services for all
  - Governance and Performance of the Water and Sanitation Sectors
  - Financing and investment mechanisms for water and sanitation

Time for Coffee and Tea

(10 minutes Break)

forum.susana.org

SuSanA forum moderation:

Updates and Way forward

Chaiwe Mushauko-Sanderse &
Paresh Chhajed-Picha (Forum Moderators)

Content

1. Introduction to the discussion forum *
2. Role of the moderators
3. Updates - Developments in the past year
4. Way forward

* A longer presentation with facts about the discussion forum and a moderator guide is available here: https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/3630

1. Introduction to the discussion forum

Goal and objectives of the Forum

- Goal:
  - The forum makes knowledge, ideas, and debates around sustainable sanitation (and broader WASH sector) **accessible to everyone** within the network and beyond.

- Objectives:
  - To **accelerate learning** within the sanitation sector
  - To facilitate **sharing of knowledge**
  - To help people to **network** within the SuSanA community

Contributions of the Forum to the WASH sector

- **Accessibility** of information and reports - allowing for **critical feedback**
- **Networking**, finding jobs, helping newcomers to get visibility
- **Exchange platform** for announcements and news, but also controversial discussions and new topics to take place
- Increased **outreach and dissemination** of events, projects, publications
  - Also linking them with on-going and new discussions
- **Knowledge management** of project and research outcomes

→ **One-stop shop** for all sanitation-related topics and an exchange platform for sanitation practitioners

Reference: Presentation titled “Everything there is to know about the SuSanA Discussion Forum” available here: https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/3630

Characteristics of the forum

- **Convenience and efficiency** for sharing information, experiences and practical problem solving ideas
- **Accessible** to anyone with internet access
- **Inclusive**: Open, friendly, welcoming atmosphere, respect and passion for the cause
- **Focus** on sustainable sanitation and broader WASH sector (SDG 6)
- **Supportive and fun**: communication in a personal, friendly non-anonymous manner

Reference: Presentation titled “Everything there is to know about the SuSanA Discussion Forum” available here: https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/3630

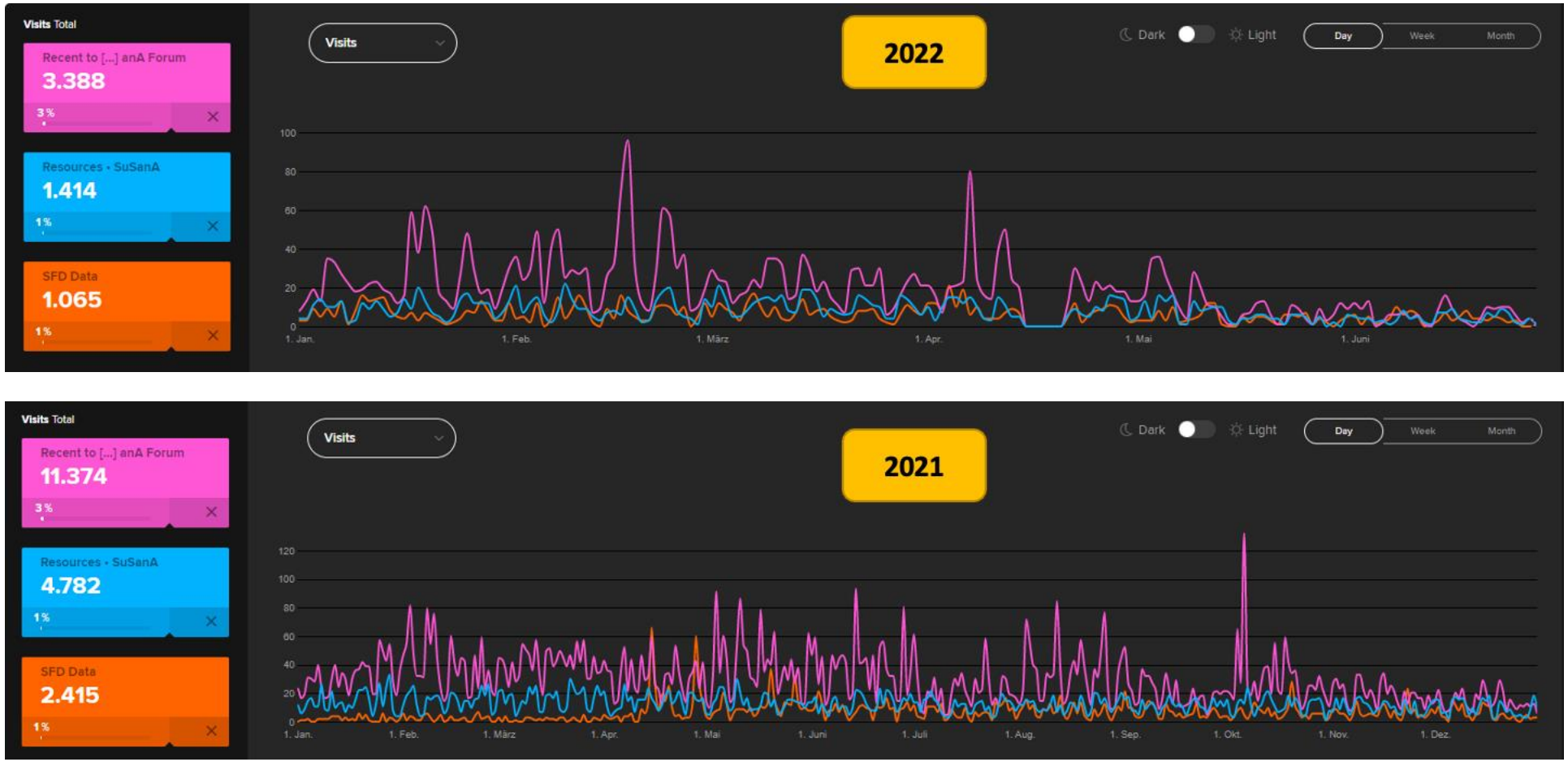
Forum within the Network

The most active component of the network, records activity almost everyday

Everyday utility for other components

Graphic adapted from slide 5 of the presentation titled “Everything there is to know about the SuSanA Discussion Forum” available here: https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/3630

Forum vs Resources vs SFD Data



2. Role of the Moderators

Role of moderators

*The moderators are committed to creating on the Forum the '**SuSanA spirit**' which is that of sharing and collaboration*

- ensure the users enjoy their experience on the forum
- aim for lots of high quality posts from a diverse range of people from all over the world
- help provide a friendly, fun and supportive online space
- make the forum into a "buzzing" space that everyone in the WASH sector knows about and loves

What do Moderators do?

- Make posts (reply to ongoing discussions, initiate new threads)
- Email members or sector experts who could contribute to ongoing discussions
- Email to members to initiate discussions based on new publications (incl. inviting new people to become a member)
- Promote the forum and its content on social media
- Support new members on-boarding
- Make posts more readable (editing titles, delete spam, delete duplicate posts, formatting)
- Strategic support to the secretariat
- Update/support updating key references, including the review of uploaded publications, videos, presentations shared on the forum)
- Make science more accessible (Wikipedia editing)
- Attend CG and FPG meetings
- Participate in global, regional, and SuSanA events
- Conduct and attend promotional webinars, meetings, trainings to encourage forum usage.
- Remain abreast with recent sector trends and topics key for forum posts

3. Updates - Developments in the past year

Updates

- **Funding** provided by GIZ through a grant to Skat Foundation
  - Basic moderation (reduced to cumulative 5 days a month from the 15+ days)
  - 2 moderators from the Global South - Chaiwe from Zambia and Paresh from India
  - Elisabeth stepped down as the moderator

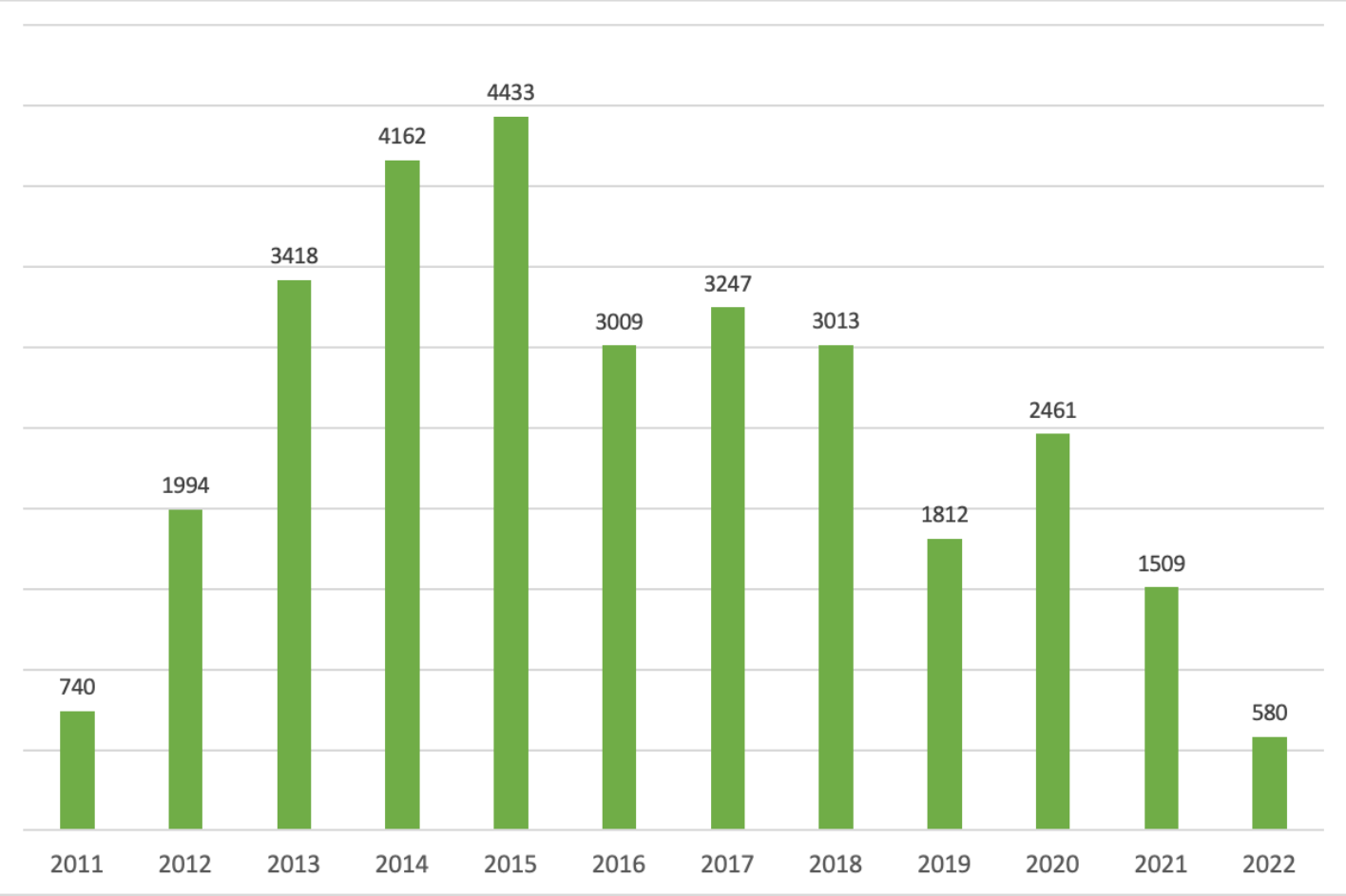
- **Strategic work**
  - Reaching out to students, doctoral and early career researchers
  - Representation at the World Water Forum
  - Reaching out to women's group

- **Donation** button
  - Introduced in August 2021, received ~1.5k Euros after transaction costs (~7% of annual target)

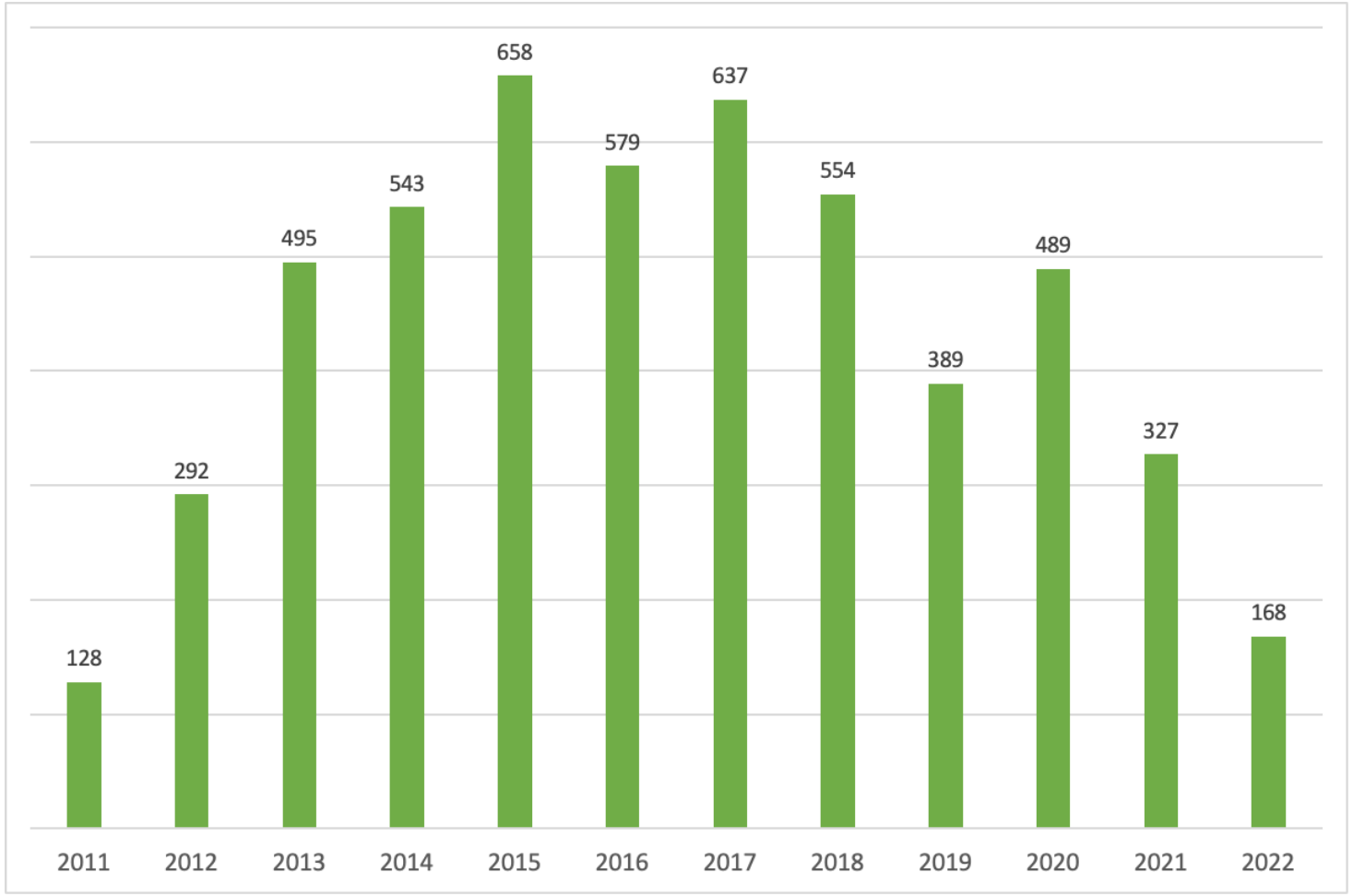
Updates - 9th World Water Forum, Dakar 2022

- Over 300 participants visited the SuSanA booth at the sanitation village during the 9th WWF;
  - A majority of visitors represented the African continent mainly (Senegal, Nigeria, Ghana, Kenya, South Africa, Tanzania, Uganda and Zambia)
  - Generally visitors expressed that they use the forum frequently to access sector information but do very little in the sense of posting.
  - An estimated 60% of visitors were members of the network, 10% had heard about SuSanA and the forum and 20% were learning about SuSanA for the first time.
  - Visitors expressed that more engagement is needed to promote user participation on the forum i.e personalised emails, webinars, user workshops
  - Visitors appreciated the physical engagement with the moderator (Chaiwe) and secretariat representative (Alexandra)

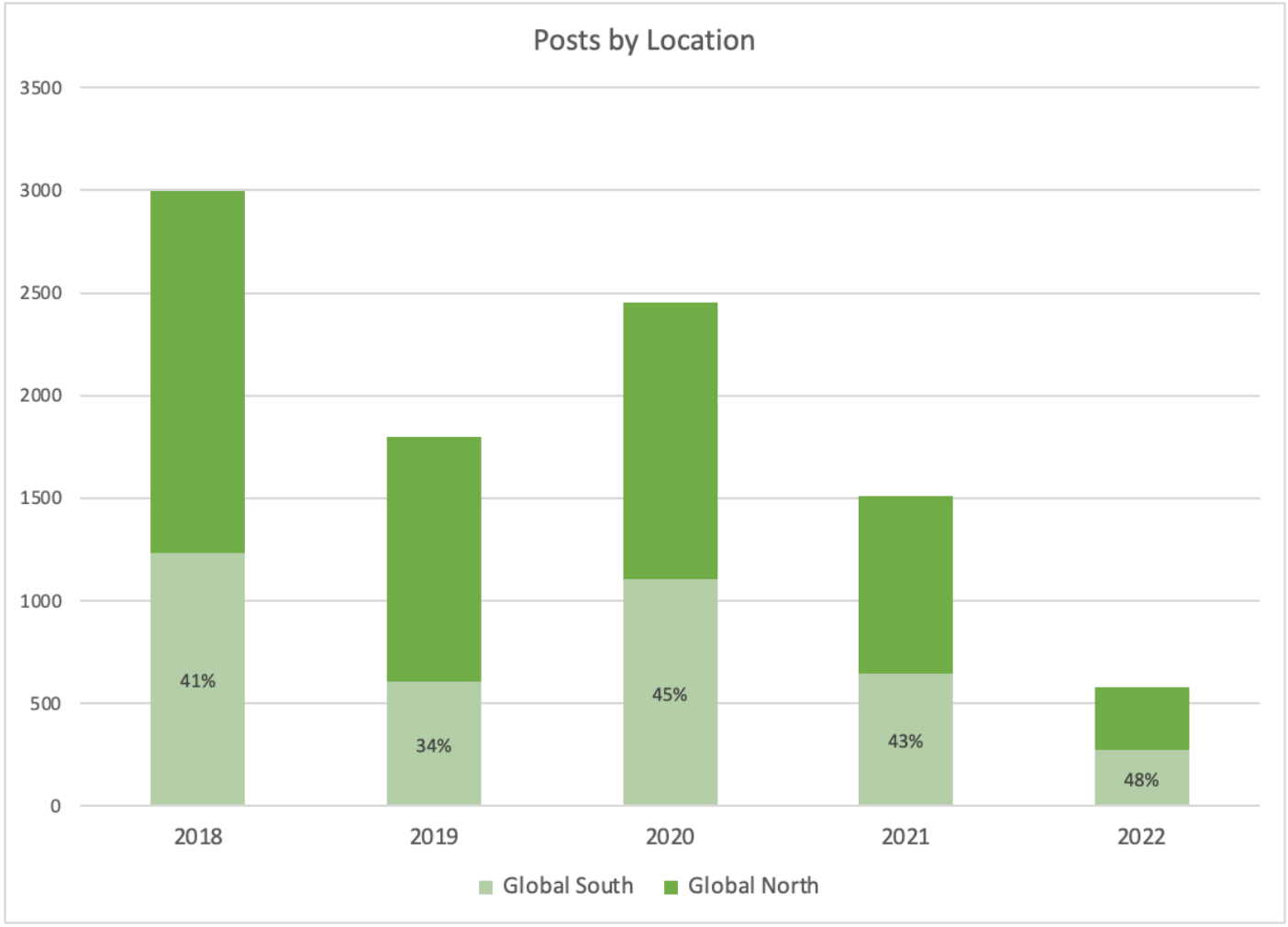
Activity on the forum - Number of posts



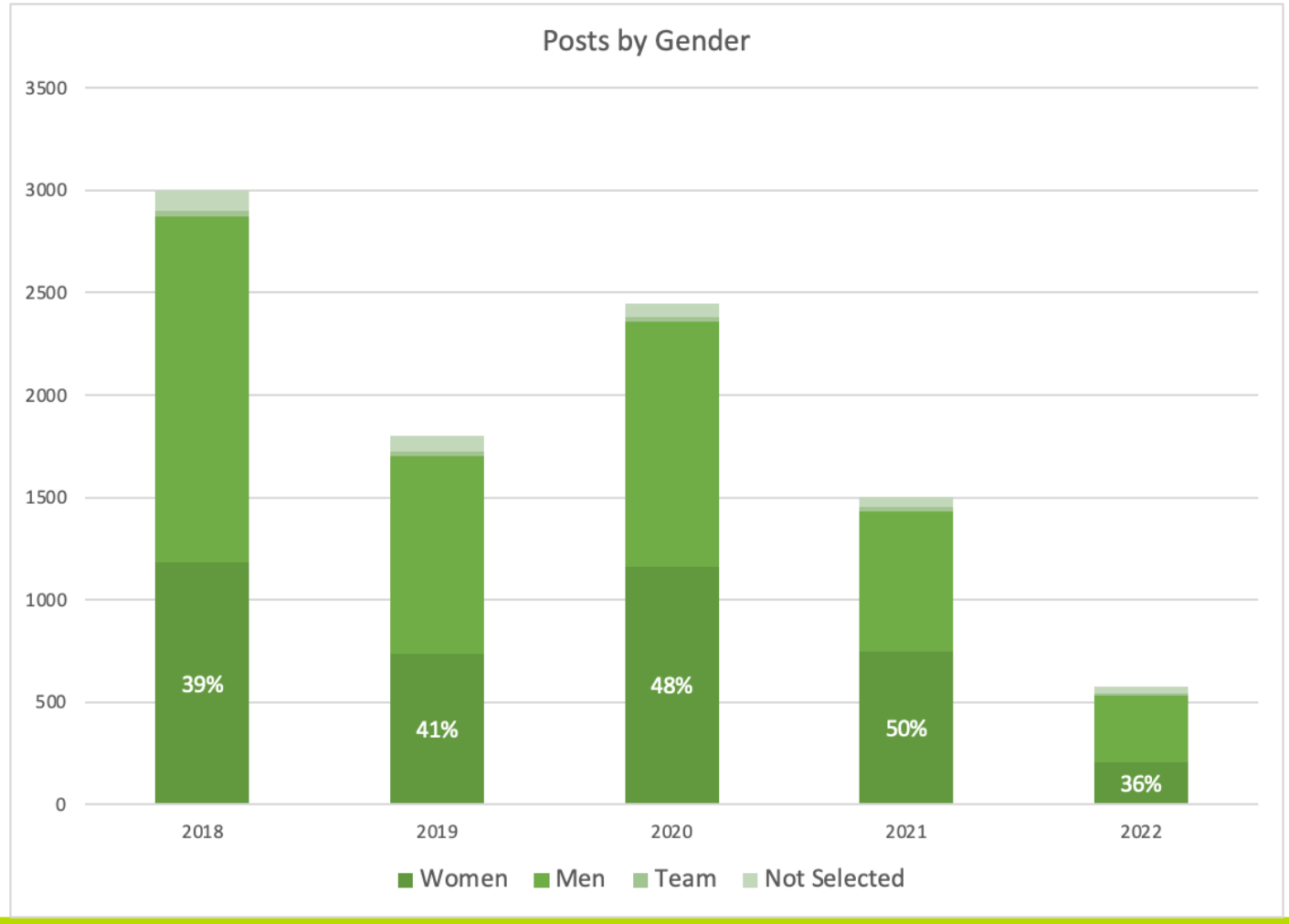
Activity on the forum - Unique contributors



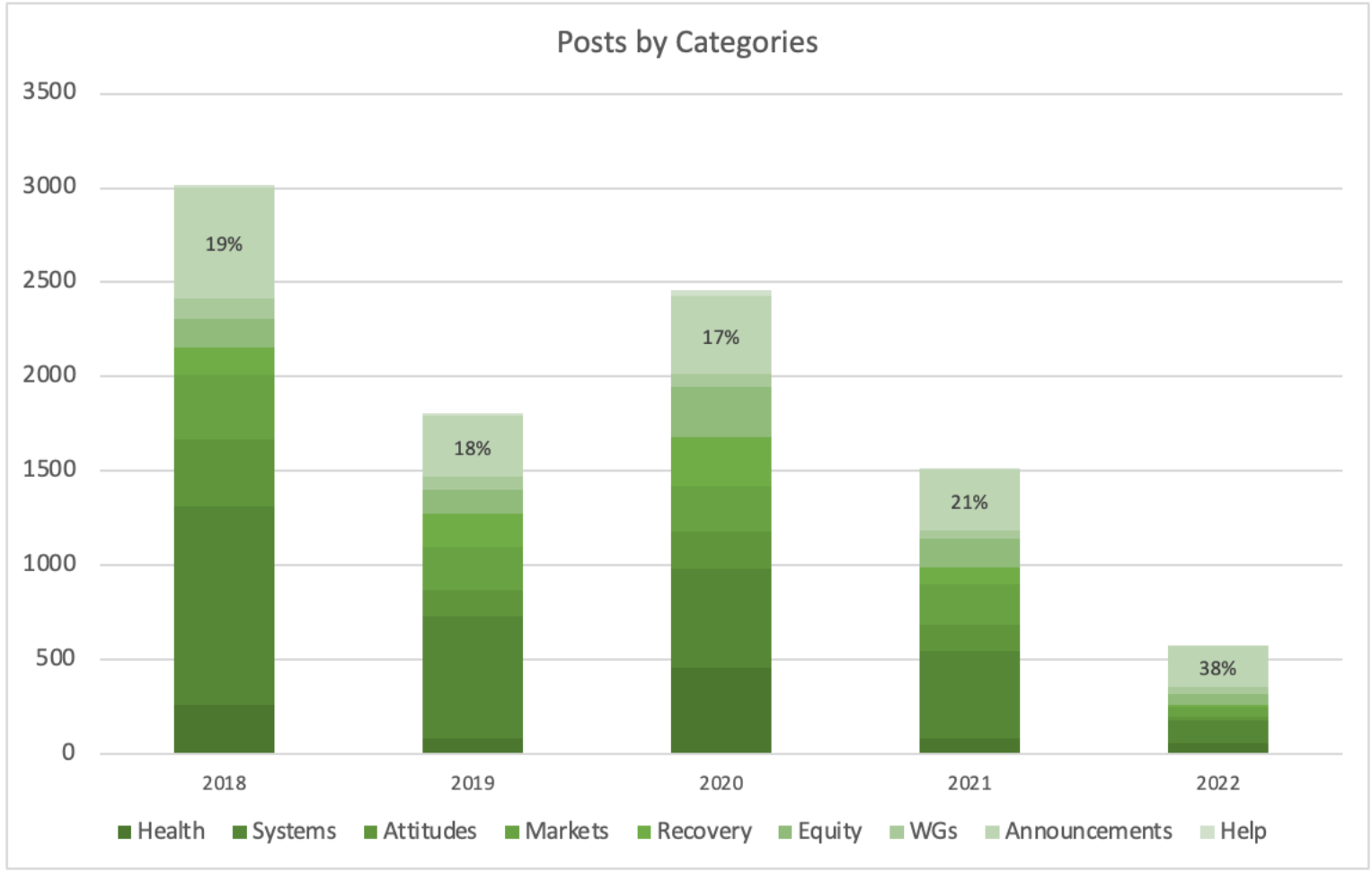
Activity on the forum - Posts from Global South



Activity on the forum - Posts by Women



Activity on the forum - Posts by Categories



4. Way forward

On-going/under consideration developments

- Recruitment of one more moderator from Latin America as part of cooperation with IDB
- Internships (possibly in partnership with other SuSanA partners and funders)
  - forum moderation + support/document activities of the funder
  - moderation component to be overseen by the moderators
- Stronger cooperation between moderators and regional chapters (incl. moderators from respective region acting as co-coordinators)
- Expanding membership in countries with limited reach (China for example)

How could we make the forum more active?

- Supporters and enthusiasts (incl. the CG) need to shed their hesitation and make more posts
  - As few as a post every month or two by all CG members would substantially add to activity on the forum
  - Will also send a strong signal to others
- If you are a practitioner:
  - Share updates/learnings from on-going projects
  - Encourage colleagues (especially early career professionals) to share their experiences, preferably include it in their time budget
- If you are an academician/researcher
  - encourage your students and ECRs to use the forum as a sounding board in the research process
  - Make use of the SuSanA Library for uploading publications
  - Make posts about useful publications you come across

How could we make the forum more active?

- If you are an event organiser
  - The forum can be used strategically to promote and shape contents of events
  - Continue the discussion on the forum from one event to shape contents of the next event
    - post/get to post key points of discussion rather than only a link to the recording

- Help the moderators reach out to more stakeholders

How can moderators support you?

- Conduct workshops (standalone or part of other planned events) for new users and provide handholding support on how to use the forum in the initial phase
- Promote/ bring more attention to events, posts, publications, etc.
- Support continue discussions on the forum from events
- Identify and bring to attention posts that may interest you (based on your expressed interests and desired frequency)
- Others please share?……

Thank You

Authors: Paresh Chhajed-Picha, and Chaiwe Sanderse Mushako,
(forum moderators funded by GIZ)

Reviewers: Members of the Forum Practice Group

SuSanA Latinoamérica

sustainable sanitation alliance

Input from the Latin America Chapter

Lourdes Valenzuela (SuSanA Latin-America Chapter)

CReW+

BORDA LAS AMÉRICAS

Online *Launch*

Regístrate: www.susana.org/en/webinar-registration-21th-june-english-session

Tuesday, June 21st, 2022, 09:00 – 09:40
Mexico Time (UTC-5)

- Six Sanitation Systems, 48 Sanitation Technologies plus emerging technologies covering the entire sanitation service chain.
- Cross-cutting issues for decision making, regionally contextualized.
- Six regional case studies.
- MOOC offered by ICAP on July 1st, 2022
  (Massive Open Online Course)

Financed by gef

Co-implemented by IDB, UN environment programme

Co-executed by giz, OAS, BORDA LAS AMÉRICAS, CWWA, SuSanA Latinoamérica, eawag

All day SuSanA Latinamerican event
tuesday october 11th - 8 hours

- Morning: Rural Sanitation (SKAT, IDB, SWA, SEI and other actors)

- Afternon: Sanitation technologies, SFD, Compendium Launch and a coctel clousere event. (Focal Points allies)

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New moderator for Latinamerican Chapter

- SKAT Foundation
- IDB
- SuSanA
- Latinamerican Chapter

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Introduction to the WASH!Game & RECLAIM Game

Belinda Abraham and Dennis Wolter (Viva con Agua)
& Jennifer McConville (SLU)

Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Makerere University

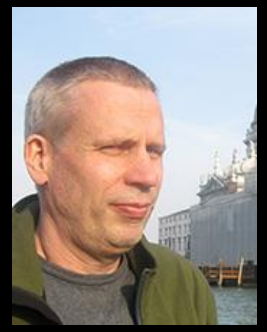
CHALMERS
UNIVERSITY OF TECHNOLOGY

RECLAIM

A Serious Game for Collaborative Sanitation Planning

Dr. Jennifer McConville
Prof. Charles Niwagaba
Prof. Jaan-Henrik Kain
Prof. Monica Billger






WHY GAMES?

Research has shown serious games to be effective for:

Motivating learning

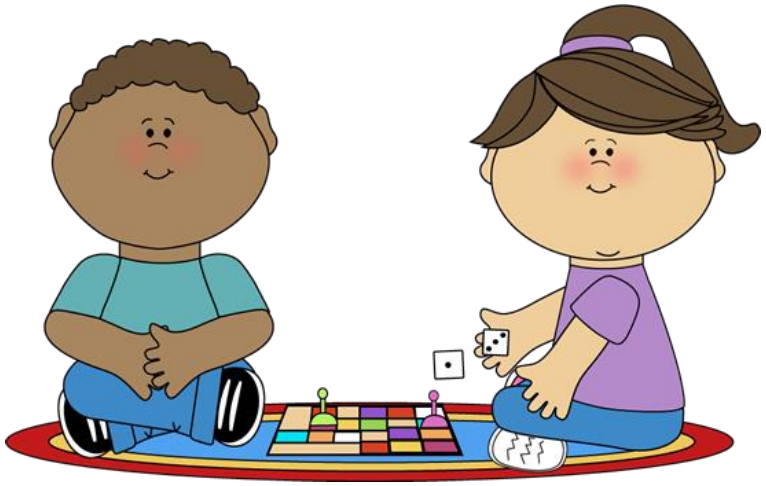
Understanding complex systems

Promoting collaboration

Creating trust

Reflecting together

Understanding different perspectives



(Poplin, 2014; Katsaliaki & Mustafee, 2015; den Haan & van der Voort, 2018)

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Games in the water sector

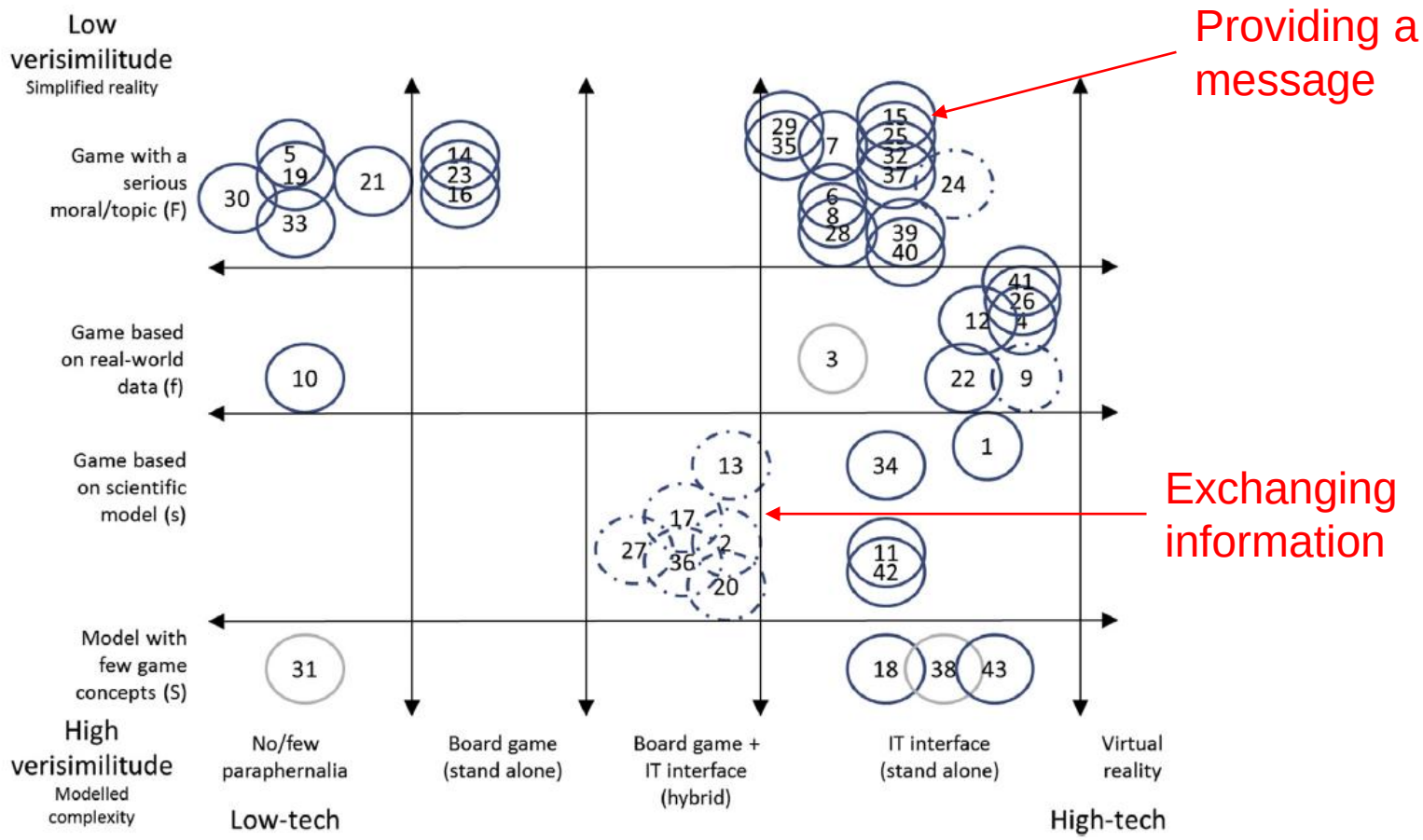


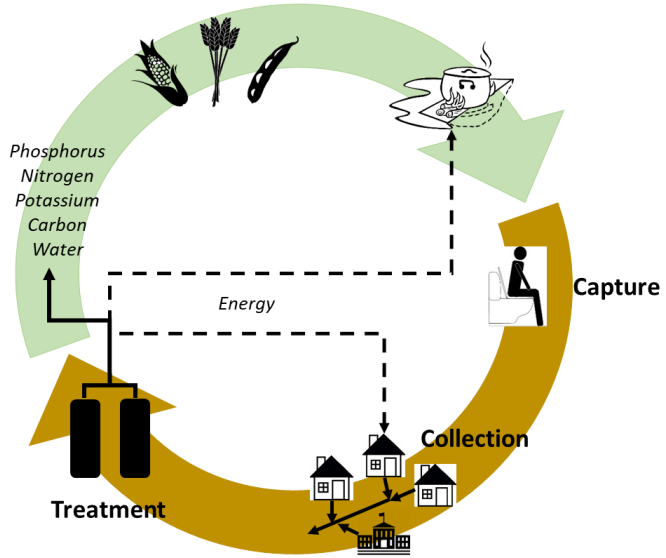
Fig. 2. Various serious game definitions lead to a wide diversity of games in the water sector. We propose to classify them according to the technology (x-axis) and verisimilitude (y-axis) degree: potentially 20 types exist. Numbers refer to Table 1, SI (games ordered alphabetically). The games' purpose is highlighted: broadcasting a message (plain dark circles), exchanging information (dashed-dotted circles) and training games (plain gray circles). The letters in brackets at the end of the verisimilitude class titles are used in Table SI1. Finer clustering of games is variable, based on other characteristics, e.g. developed by the same institution, same game mechanics (e.g. tiled-based) (see in the text).

(Aubert et al. 2018)

THE REUSE PARADIGM

- Recovery and reuse of water, nutrients & energy
- Requires connecting diverse stakeholders
- Our project aimed to:
  - Evaluate planning techniques for promoting innovation

    → Co-design a serious game



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THE RESULTING GAME

Players should:
Gain knowledge about recovery resources from sanitation

Form a **positive attitude** towards resource-recovery

Gain understanding of need for **collaboration** between sectors

Have a **positive experience**

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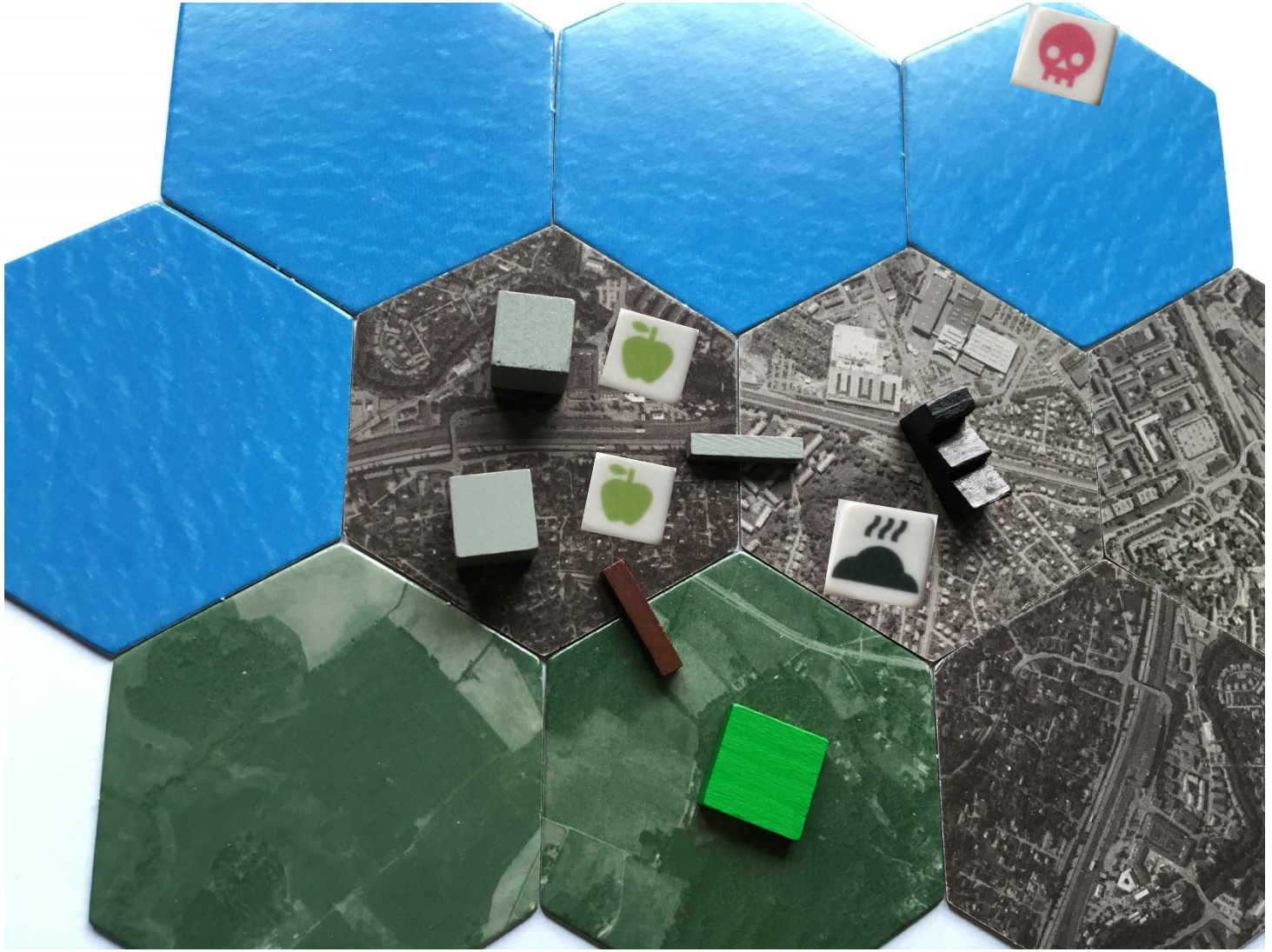

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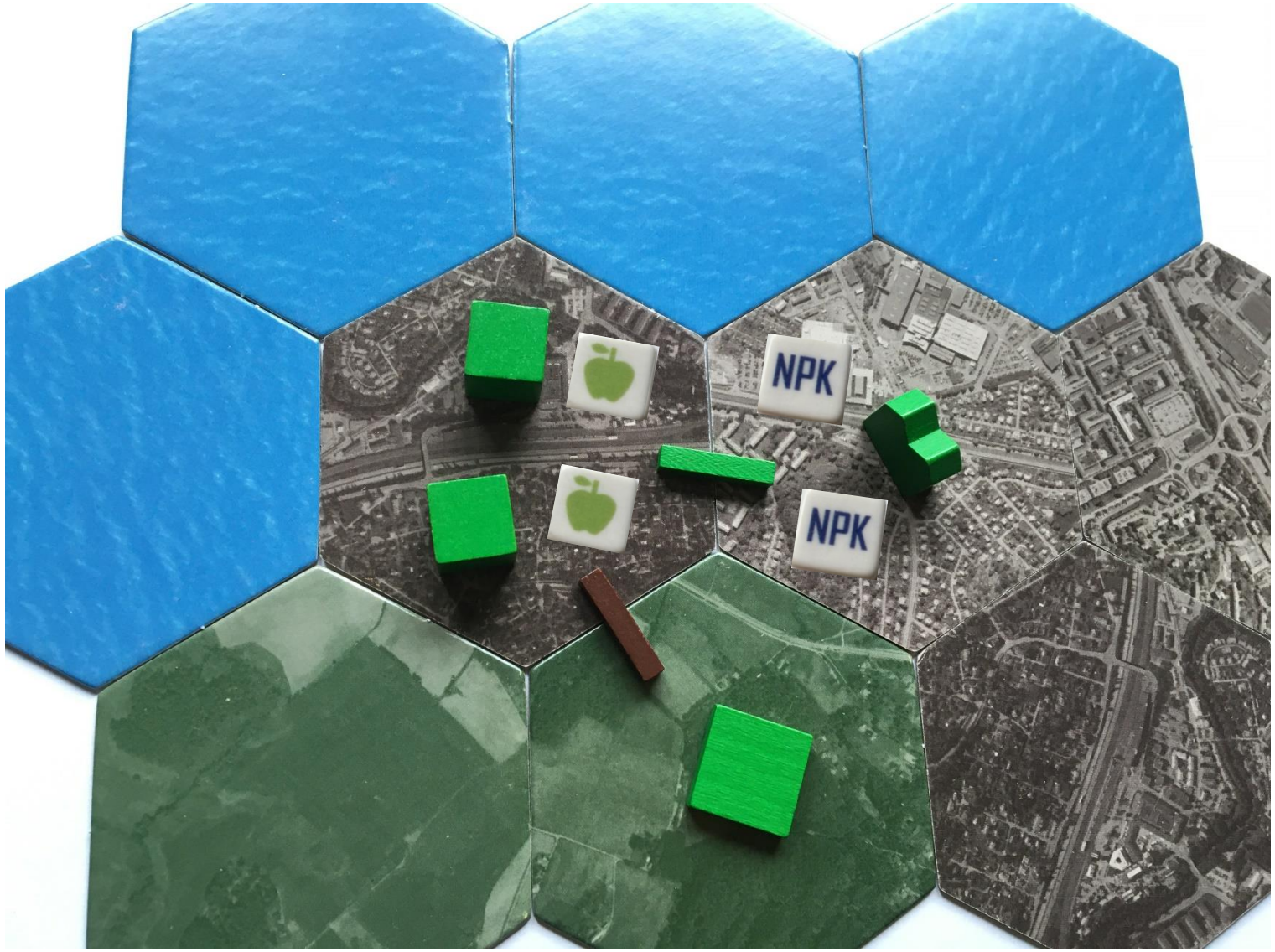

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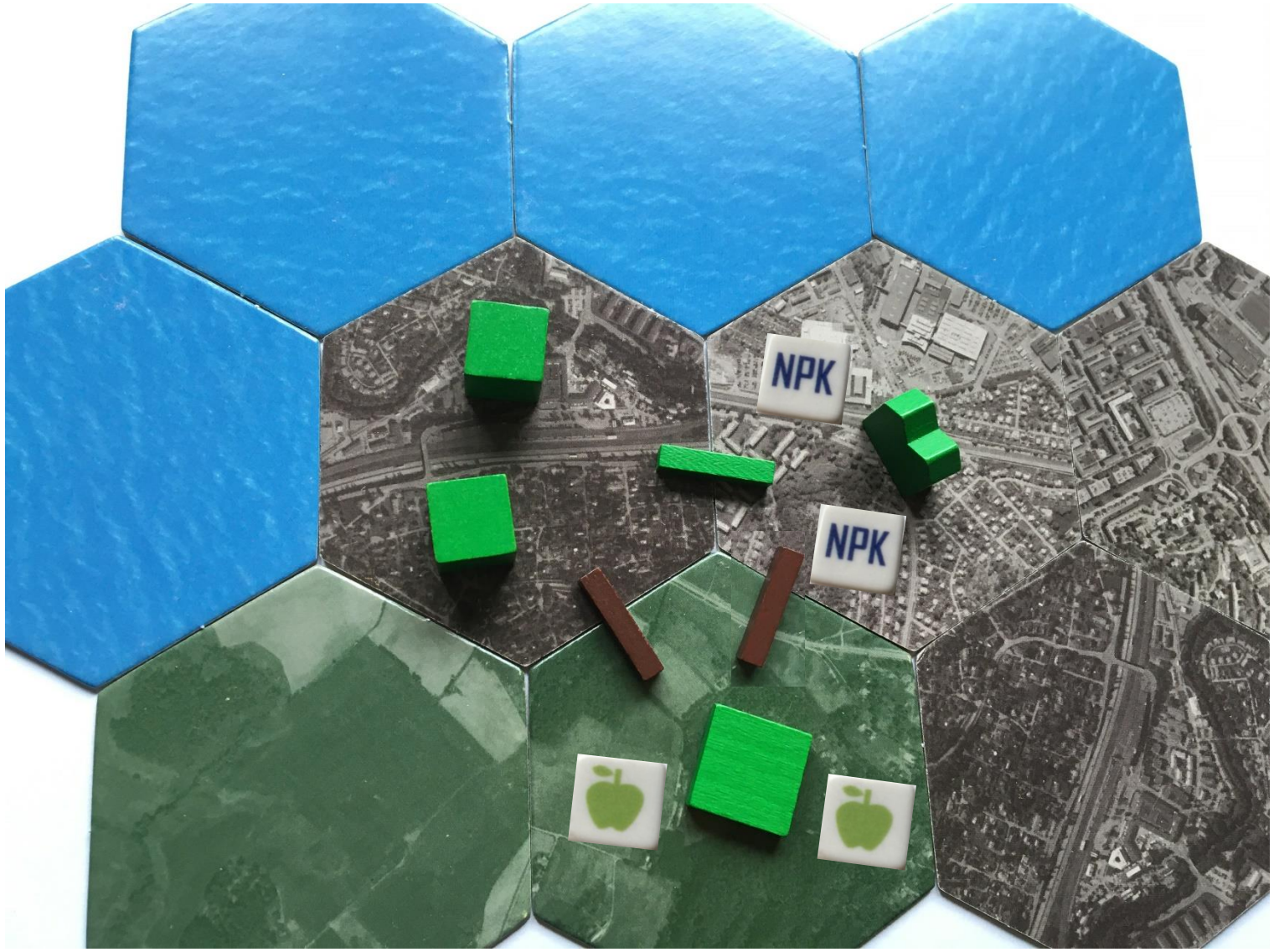

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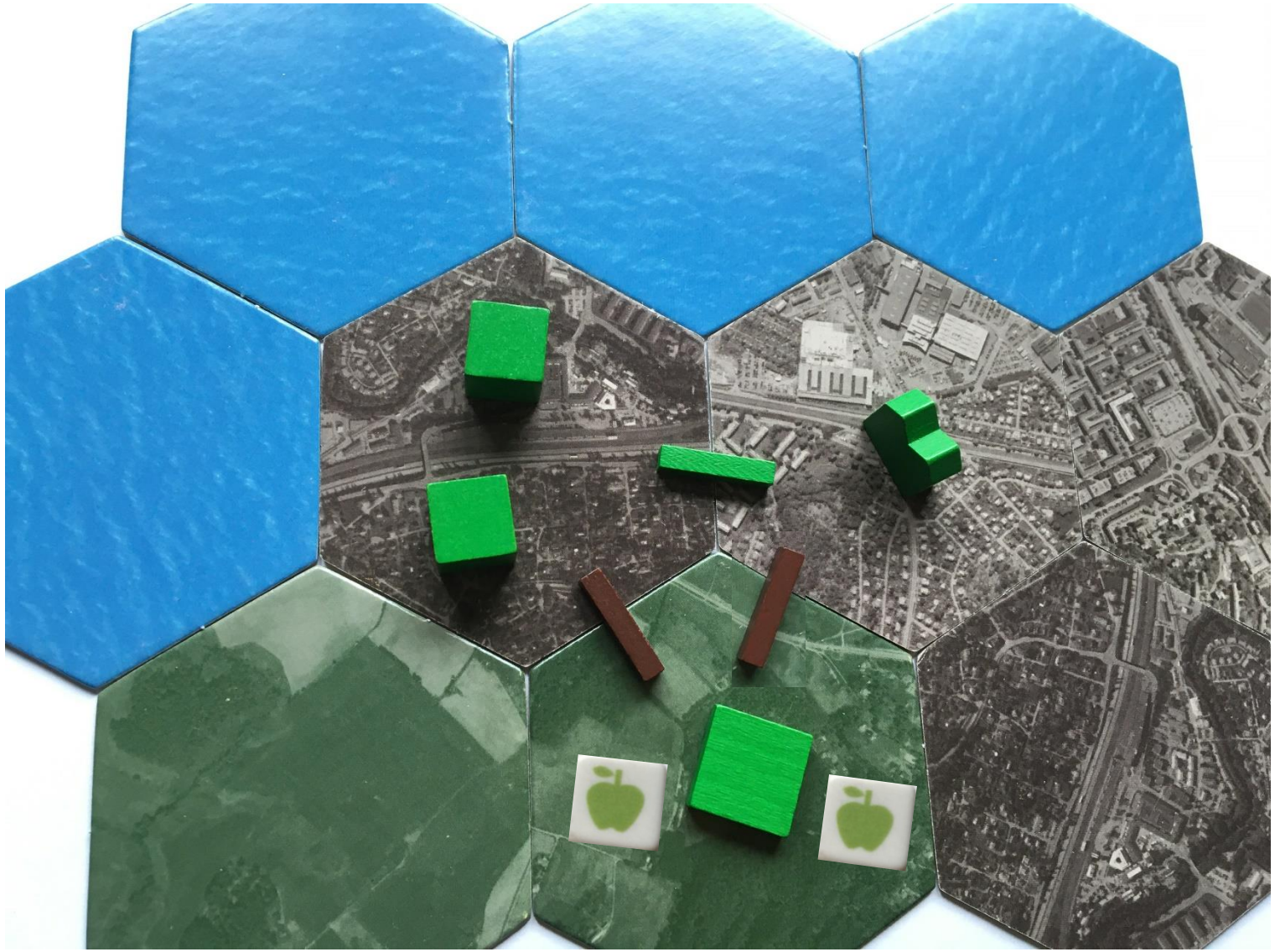

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LESSONS LEARNED

- People enjoy it
- Time is crucial
  Learning to play needs to take time
- Can’t have it all
  Removed cultural, organisation & technical aspects to simplify
  Local adaptation difficult
- Linkages to real planning processes are needed

” I think that gaming is the best feedback for passing on practical knowledge. People can visual the concept with easy”.

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FOR MORE INFORMATION

Visit the project website:

SPANS - Sanitation Planning for Alternative Nutrient-recovery Systems
https://www.slu.se/en/departments/energy-technology/projects/kretslopp/spans/
Project Leader: jennifer.mcconville@slu.se

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References

Aubert, A. H., Bauer, R., & Lienert, J. (2018). A review of water-related serious games to specify use in environmental Multi-Criteria Decision Analysis. *Environmental Modelling & Software, 105*(July 2018), 64-78. doi:10.1016/j.envsoft.2018.03.023den

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WASH!

A Strategy Game for Systemic Water & Sanitation Planning

A NOT-SO-SERIOUS WASH GAME

Why a „not-so-serious“ WASH Game?

Serious games are characterised by their educational character and learning objective – entertainment and fun is not the primary purpose.

Our WASH! Game challenges this with enjoyment factor and learning content!

VIVA CON AGUA
SANKT PAULI

A WASH! Game with Purpose

Viva con Agua developed the WASH! board game applying the **UNIVERSAL LANGUAGES FOR BEHAVIOUR CHANGE** (UL4BC) approach.

The UL4BC approach uses art, music, sport and *now gaming* for **COMMUNICATION AND TRAINING -COMPONENTS** and can **FOSTER SYSTEMS THINKING** in a joyful way.

ONE GAME TWO GOALS!

1. **GENERATE REVENUE** for WASH projects as a **COMMERCIAL GAME** ; and
2. **TRAINING TOOL for project stakeholders.**

- The idea was developed during th beginning of the COVID-19 lockdown in March 2020.
- Over **800 HOURS, 8 ITERATIVE DEVELOPMENT LOOPS AND OVER 20 TEST PLAYING SESSIONS** were invested thus far.
- Developed with input of WASH experts and game developers.


WASH!

Some points for game strategy

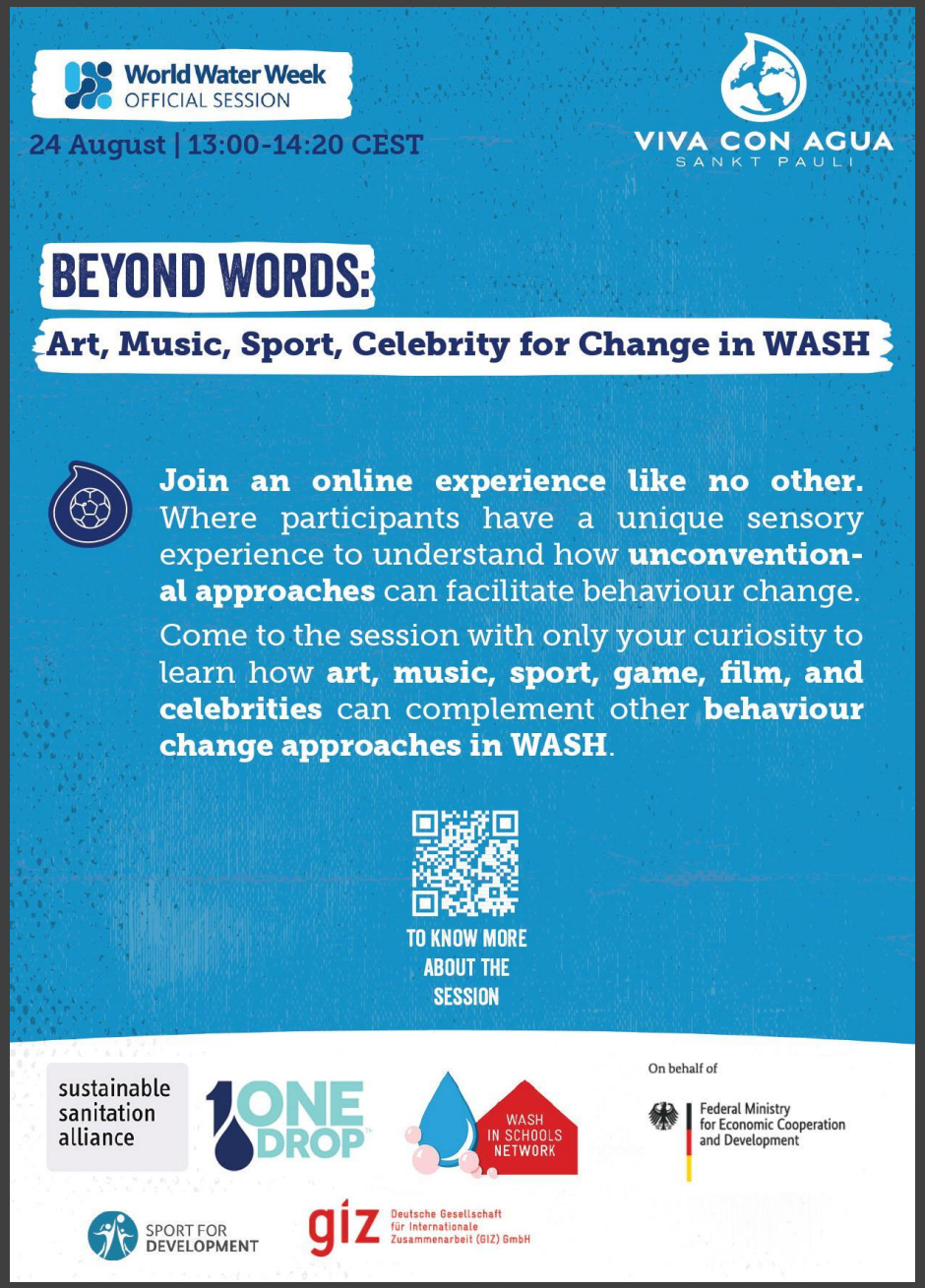
- Competitive but requires cooperation with other players because of the inherent handicaps in each role.
- While the aim is to build infrastructure at the best price for victory points, players who do not protect public health and the environment are penalized.
- The more advanced technologies yield more victory points but require greater investments in skills development and fundraising.

We will also be showcasing Game at SuSanA booth from 28 August until 2 of September

& A Second Game Night at ION Game offices, Tuesday, 30th of September in Stockholm,

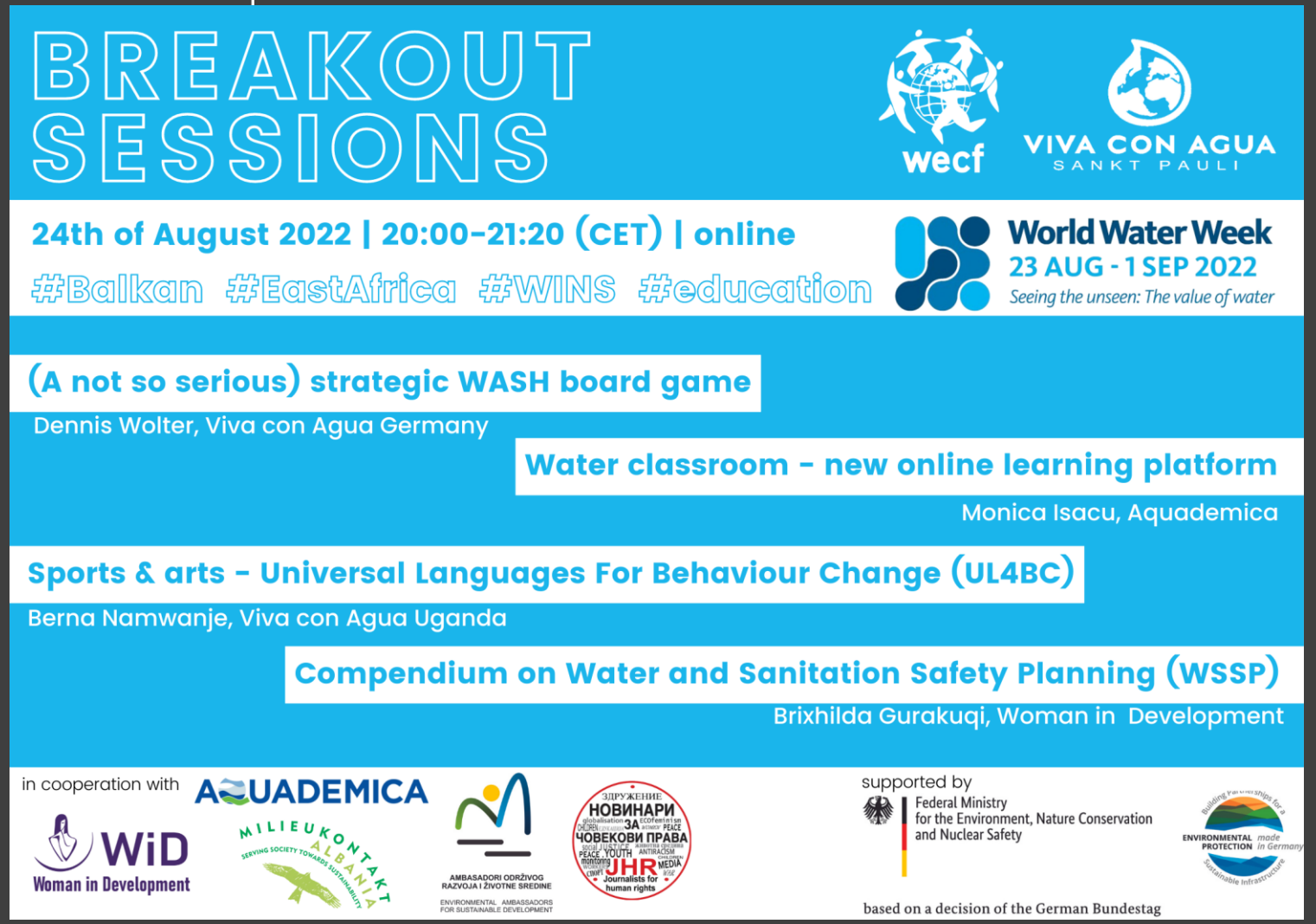
Contact Belinda Abraham b.Abraham@vivaconagua.org or Dennis Wolter d.wolter@vivaconagua.org for details !!!!!!!

VIVA CON AGUA
SANKT PAULI



Viva con Agua is at Stockholm World Water Week!

Viva con Agua/ WECF is at Stockholm World Water Week!



Time for Coffee and Tea

(15 minutes Break)

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WG 07 Sustainable WASH in Institutions and Gender Equality

Co-leads:
Bella Monse, GIZ
Belinda Abraham, Viva con Agua

Contents of Presentation

- Webinars
- Websites
- Publications
- And Beyond

Photo courtesy of UNICEF Ecuador

Webinars- 2021 (**Joint with WinS Network**)

- Virtual Open Exchange: Safe Reopening of Schools in Africa: Insights and Country Examples- 16 Nov, 2021

Featured:

- **JMP**
- **Malawi**
- **South Africa**
- **Kenya**

Photo courtesy of Esther Nyamwati, Kenya

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Chat, Listen, Exchange: WinS Network/ WG7 Webinar Series 2022

Date	Title/Topic	Presenters	Co-convenors	Participants
11 Mar 2022	Understanding the Education Sector from a WASH perspective	Ghana, Kenya, Laos, Netherlands	SuSanA Working Group 7	74
21 Apr 2022	Hygiene Behaviour Change for WinS during a Pandemic	India, Uganda, Nepal, Bangladesh, Ethiopia, PH	WaterAid	96
19 May 2022	Digital Innovations on WinS: Applying digital tools for WinS M&E	Cambodia, Indonesia, PH	GIZ	53
16 Jun 2022	WinS strategy development during a pandemic	Ghana, Kenya, Mozambique	WaterAid	46
30 Jun 2022	Handwashing Facility Designs during the Pandemic	HappyTap, SATO/Lixil, WASHaLOT	UNICEF West and Central Africa Regional Office	63

german cooperation DEUTSCHE ZUSAMMENARBEIT

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

unicef for every child

Save the Children

WaterAid

SuSanA, a key promotor for webinars

- Stocktaking webinar on safe school reopening and school readiness assessment - Global perspective and examples in September 2021;
- German Cooperation, a headline sponsor of the 2021 UNC Water and Health Conference, promoting the WinS network in October 2021
- Virtual 8th WASH in Schools International Learning Exchange in November 2021
- Is menstrual health and hygiene (MHH) the missing link in adopting a true feminist development cooperation policy?
- *Recordings available cross posting on SuSanA website/ forum*

Photo courtesy of Fit for Schools, Indonesia

Websites- *Better Together!*

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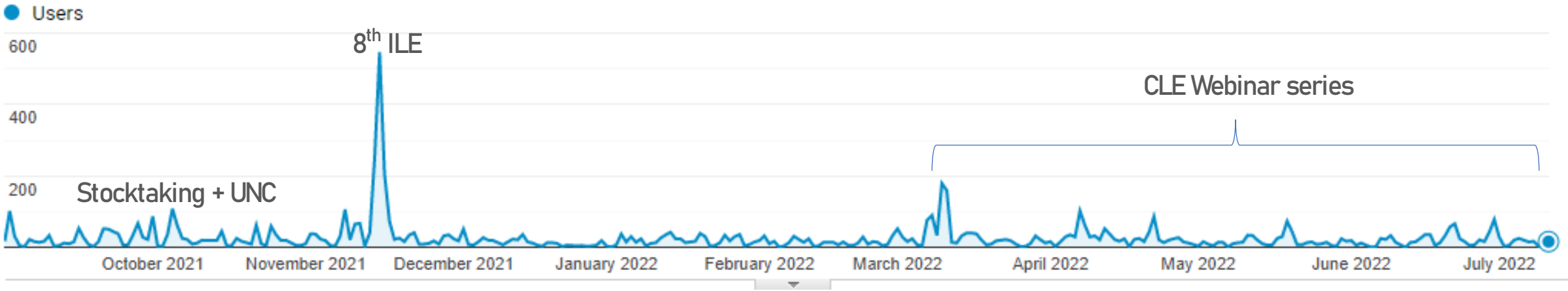
- Website Audience overview (Viewership spikes)

Courtesy of WinS Network
compiled by Fredrick Madrid



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Publications- WinS Network/ SuSanA & JMP WinS 2022 report *Launched and Linked* !!!!!

https://www.winsnetwork.org

HIGHLIGHTS

PUBLICATION / THU, 14 JUL, 2022

WASH in Schools in focus: Country Examples of PPR through the lens of enabling environment matrix

READ MORE

REPORT / MON, 11 JUL, 2022

Progress on drinking-water, sanitation and hygiene in schools: 2000 - 2021 data update

READ MORE

SuSanA/ WinS Network Joint Publication 2022

WASH in Schools in Focus: Country Examples of PPR through the Lens of Enabling Environment Matrix

Notable efforts from 20 ILE other countries, highlighted using EE matrix and focus stories from:

- **Ecuador: Policy and Planning**
- **Kenya: M&E**
- **The Philippines: Capacity Development**
- **Malawi: Capacity Development**
- **Indonesia: Policy/Planning, Budget/ Expenditure**
- **India: Implementation Arrangements**
- **Timor Leste: Budget/ Expenditure**
- **South Africa: Capacity Development**

Photo courtesy of UNICEF Ecuador

JMP *'World is off track for all three WASH elements of SDG Target 4a'*

Globally schools:

- 29% lack basic drinking water services,
- 28% lack basic sanitation services,
- 42% do not have basic hygiene services,
- < 1/4 of schools had disability-accessible toilets *in ½ countries reporting data*;
- Low IPC measure uptake
- **Data for 182 countries, areas and territories*

World Water Week 2022

https://www.winsnetwork.org/events

CONTACT LOG IN

WASH in SCHOOLS **NETWORK**

HOME ABOUT EVENTS RESOURCES PARTNERS WinS AND COVID-19 KNOWLEDGE MAP

UPCOMING EVENTS

ONLINE CONFERENCE

Beyond Words: Art, Music, Sport, Celebrity for Change in WASH

Online

Wed, 24 Aug, 2022

VIEW EVENT

CONFERENCE

The Hygiene and Behaviour Change Coalition: Partnerships in a Pandemic

Stockholm, Sweden

Tue, 30 Aug, 2022

VIEW EVENT

CONFERENCE

WASH in Schools (WinS) - Linking Education, Health, and Gender

Stockholm, Sweden

Wed, 31 Aug, 2022

VIEW EVENT

And Beyond World Water Week

- Virtual 9th WASH in Schools (WinS) International Learning Exchange (ILE) 2022: 31 August to 21 September 2022
- Global 12 Country Study on Three Star Approach in collaboration with UNICEF/ GIZ Fit for Schools- September 2022
- ILE Africa November: Location TBD

Photo courtesy of Ghana Education Service

And Beyond

- Collaborations with other networks beneficial!
- *Widening the networks and topics*
  - Gender Equity:
    - Sextortion
    - MHM/ MHH
    - Advocacy
  - WASH in Health Centres
  - Hand Hygiene

- Promote the more active use of the forum by members through launch and dissemination of publications and webinars

Photo courtesy of Fit for Schools, The Philippines and Department of Education

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Thank you!

Co-leads:
Bella Monse, GIZ, bella.monse@giz.de
Belinda Abraham, Viva con Agua Germany
belinda.abraham@googlemail.com

Time for Coffee and Tea

(25 minutes Break)

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Papers to practice: GHG emissions from different sanitation systems

Laura Kohler & Dorothee Spuhler (WG 01),
Sasha Cramer (SOIL Haiti) and
Rebecca Ryals (University of California, Merced)

Feedback

1 • How would you rate this event?

4.4 / 5

These results are based on the answers of 27 participants. End the vote when you've had enough answers.

2 • In which branch/sector do you work?

1	Local NGO	3%
2	International NGO	18%
3	Private Sector	14%
4	Education/Research	37%
5	Network/Association	11%
6	Governance/State-owned organisation	18%
7	Other	14%

These results are based on the answers of 27 participants. End the vote when you've had enough answers.

Display

3 • What themes/sessions were you most interested in?

1	WASH and Food security	51%
2	Urban Sanitation	62%
3	Wastewater surveillance	29%
4	Decision support tools	33%
5	Speed launches	22%
6	Climate mitigation and adaptation	29%
7	SuSanA Forum	29%
8	WASH board games	33%
9	WASH in institutions	29%
10	Live podcast on GHG from human waste management	25%
11	SuSanA updates: secretariat and change process	18%
12	Updates from the Regional chapters (India, Africa, Latin America)	37%

These results are based on the answers of 27 participants. End the vote when you've had enough answers.

Display

4 • Do you have any suggestions or comments for the organisers of the SuSanA meeting?

List | Word cloud

Excellent knowledge platform

It was a great informative meeting. short and sweet

Check presentations before the meeting to see which best fit the session. There was e.g. one at the start on closing loops (reuse) which did not mention this part at all but only toilet installations. This would allow you to give those who fit less also less time and those which are on the point more time.

how do you become an active SuSana regional chapter member

No

N/A

well i love the focus on the SDGs implementation along with the programs

Well done - given the multi regions participation. Excellent preparation & moderation!

Very informative and love the wide range of topics!

Waste management

Excellent session ! A hybrid session in the near future ?

More of research findings should be discussed for improved sector performance

These results are based on the answers of 12 participants. End the vote when you've had enough answers.

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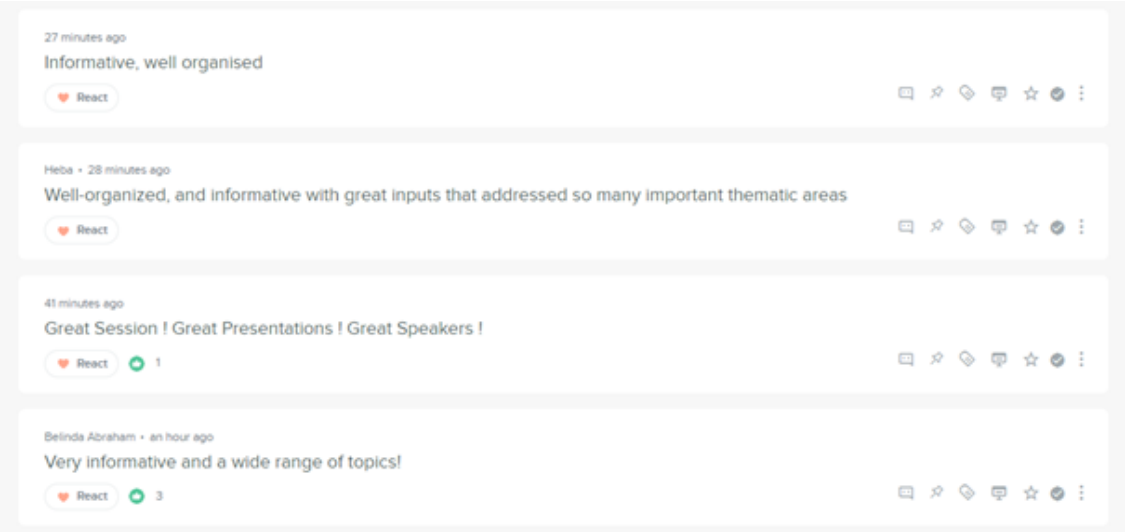
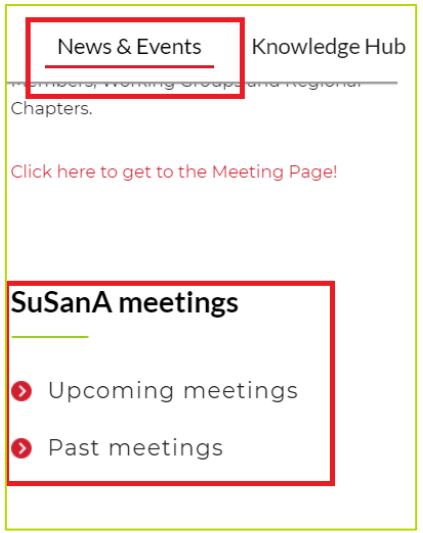
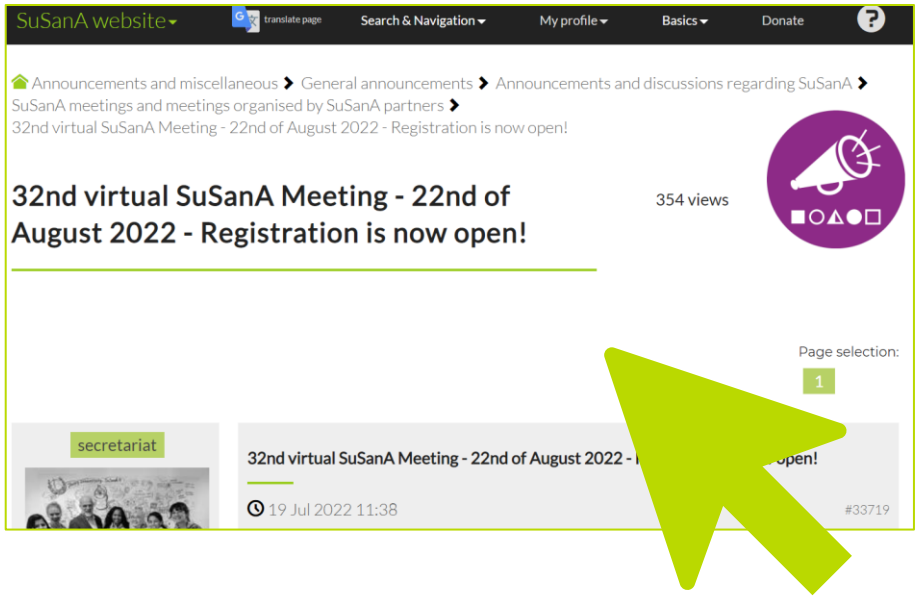


SuSanA Meeting: Presentation and Recordings

- Presentations and Recordings will be uploaded on the SuSanA Website – here.
- We invite you to continue the Discussions in the SuSanA Discussion Forum – here.





Visit us at susana.org

Thank you!