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Solving urban sanitation – sustainably and equitably

Citywide Inclusive Sanitation (CWIS) is gaining traction as an integrated approach that can achieve multiple United Nations Sustainable Development Goals (SDGs). **Abishek S. Narayan** and **Christoph Lüthi** at the Department of Sanitation, Water and Solid Waste for Development (Sandec) at the Swiss Federal Institute of Aquatic Science and Technology (Eawag) in Zurich, Switzerland, explain the concept and its implementation through current projects.

Progress on household sanitation coverage to date has been disappointing as 2.3 billion people around the world still lack improved sanitation. Achieving universal coverage by 2030 will require greater efforts in doubling the current annual rate of increase. Although coverage in urban areas is higher than in rural areas (85 percent compared to 59 percent), the issues of rapid urbanization outpacing the existing gains, higher population density, and urban poverty make it more challenging to provide sustainable urban sanitation. Moreover, sanitation coverage is far lower when considering safely managed sanitation along the entire service chain, from toilets to treatment.

According to this latest report by the Joint Monitoring Programme's "Progress in Drinking Water, Sanitation and Hygiene," (2019) only 45 percent of the global population (3.4 billion people) used safely managed sanitation services. In this case, the urban-rural gap is less pronounced with coverage in urban areas only marginally higher in urban than in rural settings.

Unlike the precursor, Millennium Development Goals, the Sustainable Development Goals (SDGs) define a holistic understanding of global sustainability with a more inclusive approach across several targets and goals. The SDG Goal 6 on water and sanitation have informed many ambitious new developments, including fresh thinking on urban sanitation. The thinking has progressed from viewing sanitation as exclusively access to toilets to safe management of the entire service chain. It has also led to an evolved understanding of sanitation as a service provision target compared to mere infrastructure development. These targets are not the new gold standard because several key aspects such as indicators for shared sanitation, gender equal access, or sanitation access beyond the household (such as in schools, offices, and healthcare facilities) are still missing. Even so, the SDGs have provided a step forward in the right direction with respect to safely managed sanitation.

There are, however, rising concerns about sustainability of urban sanitation provided within the conventional institutional framework and the challenges of rapidly increasing urbanization in low- and middle-income countries. Continuing operations without making adjustments is therefore not an option, and the sanitation sector needs to make changes if universal access is to be



achieved by 2030, as per the SDG 6.2 target of universal access to safely managed sanitation.

This is further complicated by the fact that, in dense low-income urban contexts, sanitation is closely interlinked with other basic urban services such as water supply, solid waste management, and storm water drainage. It is clear that one service alone cannot be improved without an integrated approach. All this requires a paradigm shift in the approach to urban sanitation by transcending sectoral boundaries and looking beyond conventional solutions.

CWIS

To answer the above call for change, major players from international development, academia, and nongovernmental organizations (NGOs) who were best placed in the sanitation sector to initiate such a paradigm shift, proposed the CWIS concept. CWIS is a new encompassing approach, a near counterpart to the concept of

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

Since its introduction, it has gained traction among various development agencies such as the World Bank, the Gates Foundation, the Asian Development Bank, and WaterAid, among many others. Although it is a concept that is differently interpreted, the Manila conclave in 2018 brought a wide range of actors together and started discussions on the principles for CWIS leading to a broad consensus under six key factors to consider.

The CWIS approach to urban sanitation requires a systemic change for it to achieve the vision of sustainable and equitable sanitation that brings various stakeholders working together

towards the common challenge. Such a commitment from the stakeholders is in fact half the solution itself.

According to a 2020 *Frontiers in Environmental Science* article, “Citywide Inclusive Sanitation – Business as Unusual: Shifting the Paradigm by Shifting Minds,” there needs to be comprehensive planning methodologies, flexible financial mechanisms, capacity-building amongst planners and decision makers, enabling policies and regulations, and strong advocacy to entrench the CWIS approach.

The gains made from backing this will not only ensure the long-term sustainability of the sanitation solutions, but also have multiple spill-over effects for other urban development goals, reported another *Frontiers in Environmental Science* 2020 article, “Citywide Inclusive Sanitation: A public service approach for reaching the urban sanitation SDGs.”

CWIS directly contributes to the progress of

Manila Principles on CWIS

1. Equity

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

2. Environment and public health

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

3. Mix of technologies

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

4. Comprehensive planning

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

5. Monitoring and accountability

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

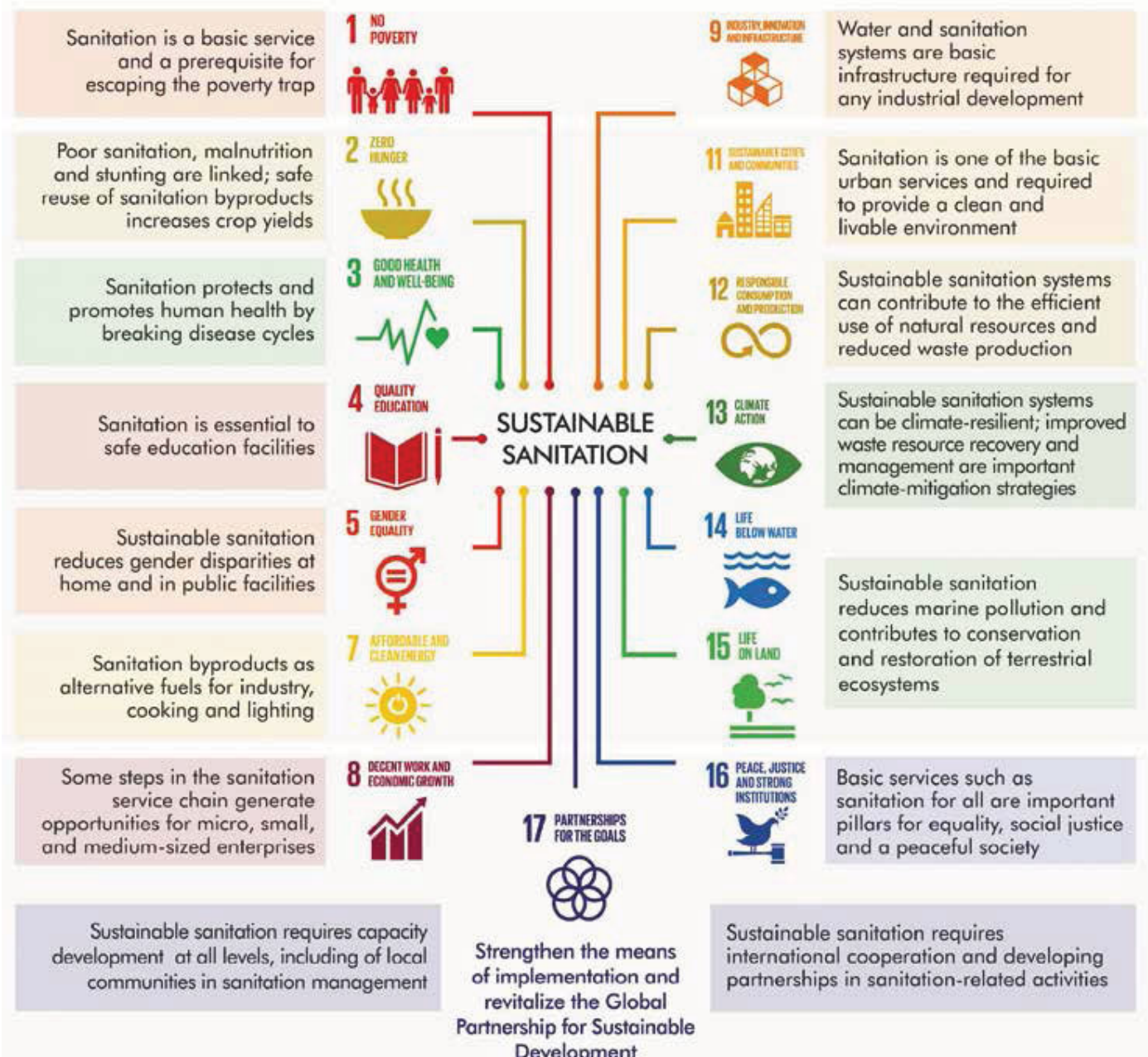
6. Mix of business models

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

Source: Manila Principles on CWIS. Source: (Narayan and Lüthi 2019)



Simplified sewers are being installed in Nala, Nepal. Photo credit: CIUD



A 2018 illustration showing interlinkages of sustainable sanitation with SDGs. CWIS presents a strong way to leverage sanitation, which as such has interlinkages beyond SDG 6. Source: Sustainable Sanitation Alliance

SDGs such as good health and wellbeing (SDG 3), gender equality (SDG 5), reduced inequalities (SDG 10), and sustainable cities (SDG 11) – according to a 2018 policy brief titled, “Citywide inclusive sanitation: achieving the urban water SDGs” in the UNDP World Centre for Sustainable Development report, “Urban waters – How does water impact and is impacted by cities and human settlements?”

Operationalizing CWIS in lighthouse cities and towns

The CWIS principles provide a framework for action by setting the broad vision for sustainable and inclusive urban sanitation. However, there is no single approach for reaching these goals. Each case needs contextualized targets and an operational approach embracing the CWIS principles. Therefore, no case study exists (yet) that binds all six principles to serve as an example of success.

However, exemplary projects in lighthouse cities and towns exist for each of the CWIS principles, which are inspiring in this regard.

Equity: eThekweni

The eThekweni Municipality in South Africa (formerly Durban) embraced a novel approach to providing adequate and affordable sanitation services to all of its population in 2004, including under-served informal settlements and peri-urban districts in the hinterland. The municipal water services department was looking for a cost-effective alternative to waterborne sewage for its vast peri-urban settlements, which were unlikely to be connected to the city’s sewerage in the medium term. All households outside the sewered town center have been provided with urine-diversion dry toilets (UDDTs), thanks to a national subsidy scheme called the Municipal Infrastructure Grant (MIG) to subsidize high-

quality UDDTs for these households. To date, more than 95,000 UDDTs have been installed in the peri-urban settlement areas of eThekweni, according to the Sustainable Sanitation Alliance (SuSanA), a global sanitation network that supports collaboration and knowledge management.

Further Reading: <https://tinyurl.com/y7alalet>

Environment and public health: Sinnar

Sinnar is a small city near Mumbai in India where the priorities go beyond open-defecation-free status to management of the entire sanitation value chain, from access to toilets to treatment of fecal waste streams. Apart from providing subsidies and credit for individual household latrines, efforts were taken in the last few years to build and maintain community and public toilets. Scheduled desludging services provided by the city government and a global positioning system (GPS)-enabled vehicle tracking system ensures

The CWIS approach to urban sanitation requires a systemic change for it to achieve the vision of sustainable and equitable sanitation that brings various stakeholders working together towards the common challenge.

that the fecal sludge is transported directly to the treatment facility and not dumped into the environment. There are ongoing plans of settled sewers to capture grey water for treatment and reuse in industries.

Further reading: <https://tinyurl.com/scztxla>

Mix of technologies: Addis Ababa

Addis Ababa is the fast-growing capital city of Ethiopia. Although the city has not yet achieved improved sanitation for all, it is taking bold steps in the right direction. Among many innovations for pro-poor sanitation services, the city government has decided to provide a mix of sanitation systems. Since only 10 percent of the city is currently sewered and the rest relies on non-sewered fecal sludge management systems, the city also built decentralized water resource recovery facilities to support the high-density clustered urban development.

Further Reading: <https://tinyurl.com/y89fbxr4>



Trucks empty fecal sludge into sludge-drying beds in Nairobi, Kenya. Photo credit: Mara van Welie

Comprehensive planning: Nala

Nala, a small town in Nepal, used a comprehensive planning approach for improving environmental sanitation using the people-centered Community-Led Urban Environmental Sanitation (CLUES) approach pioneered by Eawag's Department of Sanitation, Water, and Solid Waste for Development (Sandec). The planning was inclusive and participatory and resulted in high ownership of project implementation. User preference, technical feasibility, and financial factors were used to analyze viable service combinations through a series of consultative meetings. Two main service combinations were analyzed: (1) offsite: blackwater treatment using a decentralized water resource recovery facilities (Dewats) combined with simplified sewerage and (2) onsite: a combination of urine diversion waterless system and a pour flush system with twin pits, with provisions of fecal sludge management. Ten years after implementation, Nala is one of the few small towns in Nepal with 100-percent sanitation coverage using a combination of simplified sewers and urine diversion waterless toilets.

Further Reading: www.sandec.ch/clues

Monitoring and accountability: Warangal

Warangal is a South Indian city, which pioneered in the implementation of fecal sludge management regulations. These regulations included licensing of masons and desludging operators, personal protective equipment of sanitation workers, planning guidelines, and service level agreements with private service providers, among others. The use of information technology (IT)-enabled tools has made real-time monitoring and enforcement of regulations possible. The commitment demonstrated by local government through fund allocation and awareness campaigns have made Warangal a model sanitation city in India.

Further Reading: <https://www.susana.org/en/knowledge-hub/projects/database/details/568>

Mix of business models: Naivasha

Naivasha is a fast-growing town with a population of 200,000 at the heart of Kenya's flower-

growing industry. Since 2015, the municipality has been testing innovative service delivery models to achieve total sanitation coverage. This includes a water resource recovery facility and a design, build, and operate fecal sludge treatment facility run by the social enterprise Sanivation. In Sanivation's circular economy approach, 100 percent of received waste from latrines and septic tanks is treated and used to create solid biomass fuel and treated effluent for irrigation purposes. The facility safely and cost-effectively treats fecal sludge from pit latrines and septic tanks. The biomass fuel is sold to local flower and milk processing industries, among others. For more information, visit: <https://sanivation.com>

CWIS as a worldwide solution

In these cities and towns and many more across the globe, CWIS presents a great opportunity for realizing the SDG 6 targets on urban sanitation in a sustainable and equitable way. However, it requires a radical shift from the conventional approach and needs a strong enabling environment to support the operationalization of the CWIS principles.

Authors' Note



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Further reading

Eawag research systematically addresses the complexity of urban sanitation in order to develop appropriate sanitation systems and services in low- and middle-income countries. Since CWIS requires strong capacity development at various levels of planning and decision-making, Eawag has developed the Capacity Development for Citywide Inclusive Urban Sanitation (ConCaD) course, which is aimed at private sector consultants and planners who are often driving decisions in such contexts. The course is open source and freely available on www.sandec.ch/concad

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