

The SEI Initiative on Sustainable Sanitation

The importance of investing in sanitation has never been as widely recognized as today. The 2030 Agenda for Sustainable Development, which now guides development efforts around the world, gives water and sanitation its own Sustainable Development Goal (SDG 6), calling for “access to adequate and equitable sanitation and hygiene for all”.

But beyond this, the 2030 Agenda acknowledges the critical links between sanitation development and a huge range of other sustainable development ambitions. For example, SDG 6 calls for “halving the proportion of untreated wastewater” and protection and restoration of “water-related ecosystems” – a task that is impossible without better wastewater treatment and management.

Another significant feature of Goal 6 is the target of “substantially increasing (water) recycling and safe reuse globally”. This language reflects another major advance in international thinking about sanitation and wastewater, moving beyond the traditional realm of public health and (more recently) environmental protection and into the realm of resource management. The growing momentum behind this can be clearly seen in the themes of the 2017 World Water Day (Why Waste Water?) and Stockholm World Water Week (Water and Waste: Reduce and Reuse).

SEI has been a driving force in highlighting the potential role of sanitation as a catalyst for broader development for over two decades, with a particular focus on bringing safe resource recovery and reuse into the mainstream.

The SEI Initiative on Sustainable Sanitation (SISS), launched in 2015, gathers SEI’s current work in this area, bringing together research, capacity-building and policy support aiming to promote the provision of sustainable sanitation provision, contributing to more resilient, productive and healthier communities, with a focus on low- and middle-income countries.

SISS comes at a critical time, with unprecedented opportunities to boost sanitation provision across the world. Now entering its second implementation phase, SISS aims to build on the knowledge and partnerships developed during its first two years.

SISS vision: Sustainable sanitation systems become mainstream choices for sanitation development and accessible to all – contributing to more resilient, productive and healthier communities.

SISS mission: To boost sustainable sanitation provision at scale in low- and middle-income countries, through research, knowledge exchange, capacity development, policy dialogue, with a focus on productive sanitation approaches that yield multiple economic, social and environmental co-benefits.



SEI INITIATIVE ON SUSTAINABLE SANITATION

New approaches

In 2015, an estimated 2.4 billion people still lacked access to “improved” sanitation that safely contains excreta, protecting the user from pathogens that can cause a range of communicable diseases. Taking into account sanitation systems that release effluent untreated into the environment, or pit latrines and septic tanks that are not safely installed or managed, then only a minority of the world’s population currently uses a sanitation system that protects the health of the wider community and the environment.

With low- and middle-income countries experiencing rapid urbanization, dozens of cities need quickly to provide sanitation, wastewater management and water supply services in order to keep their burgeoning populations healthy, their water resources clean and vital ecosystem services functioning. The decisions they make and the approaches they take will have far-reaching consequences for sustainability and for the well-being of their citizens.

At the same time, open defecation and unsafe sanitation, waste management and hygiene practices remain widespread in poor rural communities in many parts of the world, contributing to self-reinforcing cycles of poverty, disease and disadvantage.

Thus the SDG goal of universal sanitation access demands new, more effective approaches to sanitation provision in both rural and urban settings. If these approaches facilitate safe resource recovery and reuse, they can catalyse development benefits far beyond health and environmental protection – boosting agricultural yields at low cost, economic productivity, smallholder livelihoods, food and water security, education, disaster resilience and more.

To meet this need, SISS research and policy support focuses on the idea of “sustainable sanitation” as a cornerstone of broader sustainable development, highlighting the multiple benefits it can provide. For sanitation to play this role requires a whole-system perspective that looks beyond the “hardware” issues to take in, for example, enabling institutional conditions and governance frameworks, and ways to change users’ perceptions and practices.

Sustainable sanitation

In the 2016 book *Sanitation, Wastewater Management and Sustainability: From Waste Disposal to Resource Recovery*, SISS elaborates a multidimensional concept of sustainable sanitation (see Figure 1).

Sustainable sanitation means both that the sanitation system remains accessible to all, functional and in use over the long term; and that it contributes positively to other sustainability priorities across the SDGs (see Figure 2).

SISS research and policy support work emphasizes that no sanitation technology is inherently more sustainable than others; rather, sustainability lies in the full, synergistic functioning of a whole system that is suitable for the needs, constraints and opportunities of the context. It is not only about hardware (toilets and related infrastructure) but also about enabling factors such as regulations, institutional structures, long-term financing and capacity for operation and maintenance.

At the same time the system must be acceptable to the users, including aspects related to reuse. Access to the system, and any related responsibilities or benefits must be equitable. The system must protect the health of the user and the wider community; and it must not harm the environment, for example through different forms of pollution or the uncontrolled release of methane. SISS is spreading knowledge and capacity about how to meet these criteria through sanitation, as well as developing new implementation tools and models.



Figure 1: Dimensions of sanitation sustainability

From Andersson et al. (2016) *Sanitation, Wastewater Management and Sustainability: From Waste Disposal to Resource Recovery*

This work builds on mounting evidence that a lack of systems thinking has directly compromised the sustainability of sanitation systems installed under past government and donor programmes. The systems have fallen out of use because, for example, no provisions were made for maintenance, institutional responsibilities were unclear, or the targeted users were not sufficiently engaged during the process.

Also important for sustainable sanitation is the idea that resource management should be a central function of sanitation – and that sanitation systems should thus be integrated into larger waste and resource management strategies. Resource-efficient systems, especially with resource recovery and safe reuse, can help to meet rising demands for clean water, food and energy. Many options are available to safely recover water and the rich nutrient and organic matter content from human excreta, wastewater and other waste flows. These resources can then be put to use in agriculture, energy production (including

Investments in sustainable sanitation and wastewater management can help countries to meet many of the other targets under the Sustainable Development Goals. In this figure, the coloured blocks indicate which targets can be promoted by providing sustainable systems with increasingly advanced and ambitious functions. Half-shaded boxes indicate a smaller (but still positive) potential contribution to achieving the target than fully shaded boxes.

Goals and targets	Waste Containment	Safe sanitation access & availability	Pathogen emission control	Nutrient emission control	Resource management & recovery
1. NO POVERTY 1.2 – poverty in all its dimensions 1.4 – access to basic services 1.5 – resilience, reduce vulnerability, extreme events					
2. ZERO HUNGER 2.1 – end hunger food sufficiency 2.2 – end malnutrition 2.3 – double smallholders' productivity & incomes					
3. GOOD HEALTH & WELL-BEING 3.2 – end preventable infant and under-5 deaths 3.3 – end epidemics combat water-related diseases 3.9 – reduce deaths & illnesses from pollution and contamination					
4. QUALITY EDUCATION 4.5 – eliminate gender disparities in education 4a – build & upgrade safe education facilities					
5. GENDER EQUALITY 5.1 – end discrimination against women & girls 5.2 – eliminate violence against women & girls in public space					
6. CLEAN WATER & SANITATION 6.2 – sanitation & hygiene for all 6.3 – reduce water pollution, increase recycling 6.4 – substantially reduce water scarcity 6.5 – water resources management, transboundary cooperation 6.6 – protect & restore water-related ecosystems 6a – international cooperation, support developing countries					
7. AFFORDABLE & CLEAN ENERGY 7.2 – increase share of renewable energy					
8. DECENT WORK & ECONOMIC GROWTH 8.4 – improve resource efficiency, decouple economic growth from environmental degradation					
9. INDUSTRY, INNOVATION & INFRASTRUCTURE 9.4 – upgrade industrial resource efficiency & clean technology					
11. SUSTAINABLE CITIES & COMMUNITIES 11.5 – reduce deaths & econ. losses from disasters 11.6 – reduce adverse environmental impact of cities 11.7 – safe public spaces					
12. SUSTAINABLE CONSUMPTION & PRODUCTION 12.2 – management & efficient use of resources 12.4 – chemicals and waste management 12.5 – reduce waste generation					
13. CLIMATE ACTION 13.1 – strengthen resilience to climate-related hazards & natural disasters					
14. LIFE BELOW WATER 14.1 – reduce marine pollution from land-based activities					
15. LIFE ON LAND 15.1 – conserve, restore & sustainably use terrestrial ecosystems 15.3 – restore degraded land and soils					

Figure 2: Multiple SDG targets benefit from sustainable sanitation

From: Andersson et al. (2016)

How SISS will work in 2017–2018

Promoting the use of sustainable sanitation in low-income countries

SISS is developing a new scalable sustainable development model for rural communities: **Clean and Green**. Clean and Green aims to promote both sustainable sanitation and hygiene practices and safer, more productive management of organic waste streams, including excreta, livestock manure, food waste and crop residues. It centres on a certification scheme similar to that used in Community-led Total Sanitation (CLTS) but designed expressly for sustainable sanitation. It will be piloted in Burkina Faso. For more on Clean and Green see Dagerskog and Dickin (2017).

Together with local partners and others, SISS is also carrying out research to better understand the role of **gender** in determining barriers to water supply, sanitation and hygiene (WASH) services, and how to overcome them. In collaboration with the SEI Initiative on Behaviour and Choice, SISS will also be exploring the role of different **messaging** in enhancing or undermining sustainable sanitation.

Building the evidence base for resource recovery

In 2015–2016, SISS began developing **REVAMP**, a tool to help urban planners, policy-makers and investors understand the resource recovery potential of a city's organic waste streams. REVAMP estimates how much of different reuse products could be produced from the city's waste streams, and their possible financial value. SISS will continue to develop REVAMP to better meet the needs of users and reflect different reuse scenarios. For more on REVAMP see Ddiba, Andersson and Rosemarin (2016).

Strengthening the global case for sustainable sanitation

SISS will draw on pioneering SEI work on mapping and analysing interactions between SDG targets to further build arguments for sustainable sanitation as a cornerstone of sustainable development.

Knowledge management and capacity development for policy change

SISS will continue to bring a **science- and experience-based perspective** on sustainable sanitation to important forums for policy-makers and practitioners. This includes convening sessions in high-profile regional and international events such as World Water Week and AfricaSan; face-to-face meetings and seminars with policy-makers and donors; internships and other support to students; publications, blogs, presentations and media engagement; and active involvement in collaborations and networks such as the Sustainable Sanitation Alliance (SuSanA).

biogas), bolstering ecosystems and biodiversity, water supply and even industry and construction. More broadly, they can improve livelihoods and open up lucrative new business opportunities.

SISS highlights to date

At the 2016 World Water Week in Stockholm, SISS launched a major publication with the UN Environment Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA): *Sanitation, Wastewater Management and Sustainability: From Waste Disposal to Resource Recovery*. This landmark book sets out the key concepts of, and arguments for, sustainable sanitation and wastewater management, rich with graphics, real-world examples and case studies of sustainable sanitation from around the world.

During 2015–2016 SISS developed and presented in forums and several publications, the basics of its work on linking sustainable sanitation to the wider 2030 Agenda for Sustainable Development.

Innovative SEI research on the ground in sub-Saharan Africa has sought to draw lessons from the successes and failures of earlier sanitation programmes in order to develop better implementation models and policy advice. In particular this research has included follow-up visits to the sites of projects that terminated several years earlier in order to see what long-term changes were achieved, and how.

The REVAMP tool prototype developed in 2015–2016 (see box above) has already garnered considerable interest, and further pilot tests and development activities are planned.

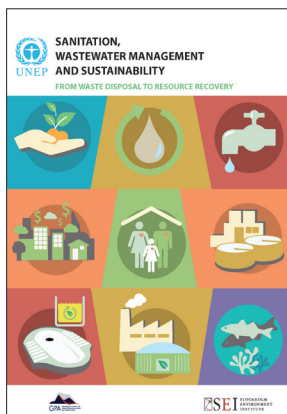
SEI continued to integrate sustainable sanitation into other related SEI research areas, such as climate change adaptation, disaster risk reduction and resilience, the water-food-energy nexus, management of environmental systems, and transforming governance and behaviour. From 2017, SISS will further expand its presence and capacity in the SEI Africa Office in Nairobi.

And SISS researchers have been prominent and active in leading international sanitation networks and knowledge

Definitions

Sustainable sanitation: Sustainable sanitation systems are those that protect and promote human health, minimize environmental degradation and depletion of the resource base, are technically and institutionally appropriate, socially acceptable and economically viable also in the long term.

Productive sanitation: Sanitation systems that make productive use of the nutrients, organic matter, water and energy content of human excreta and wastewater in crop and energy production. Productive sanitation is a term pioneered by SEI referring to sanitation systems that are designed to turn waste into valuable resources.



Sanitation, Wastewater Management and Sustainability: From Waste Disposal to Resource Recovery

by Kim Andersson, Arno
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Elisabeth Kvarnström, Jennifer
McConville, Razak Seidu, Sarah
Dickin and Caspar Trimmer

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<https://bit.ly/2dsgnA8>

constituencies. SEI has an extensive resource base in terms of staff with sustainable sanitation-related knowledge and experience, which will be further enhanced and leveraged using expertise from across our extensive partner networks.

In particular, SEI was instrumental in securing a USD 2.7 million grant from the Bill & Melinda Gates Foundation to strengthen the Sustainable Sanitation Alliance (SuSanA), a global network and knowledge-sharing platform for practitioners, policy-makers and researchers.

Initiative funding

The SEI Initiative on Sustainable Sanitation is envisaged as a five-year programme. Core funding is provided by the Swedish International Development Cooperation Agency, Sida. However, the initiative benefits from funding from a variety of sources, often leveraged with new and established partners. SEI will continue to seek partners and funding for sanitation-related activities and projects aiming to advance SEI's strategic research agenda and the initiative's mission, and enable capacity development and outreach through collaborative platforms.



"Our urine is worth gold!" – on-site urine collection in Ouagadougou, Burkina Faso

Selected publications

Andersson, K., Rosemarin, A., Lamizana, B., Kvarnström, E., McConville, J., Seidu, R., Dickin, S. and Trimmer, C. (2016). *Sanitation, Wastewater Management and Sustainability: From Waste Disposal to Resource Recovery*. SEI and UN Environment, Nairobi and Stockholm. bit.ly/2dsgnA8.

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Dagerskog, L. and Dickin, S. (2017) *Clean and Green: A New Implementation Framework for Rural Sustainable Sanitation*. SEI Discussion Brief. bit.ly/Clean-Green

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Murad, S. and Dickin, S. (2016). *Benefits and Barriers to Safe Use of Ecological Sanitation in El Alto, Bolivia: A Need for Improved Hygiene Education?* SEI Discussion Brief. <https://www.sei-international.org/publications?pid=3052>.

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