Eawag-Sandec's Research & Capacity Development Projects and the Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) agreed by the United Nations in September 2015 comprise 17 goals and 169 targets aimed at integrating matters related to sustainable development into the overall economic, environmental and social frameworks of countries. They bring together all major objectives of development and are a blueprint to achieve a better and more sustainable future for all. Whereas the SDGs have a global dimension, their implementation depends on the level of priority different countries give to them, and on how sustainability issues compete with a country's main problems.

Author: Sandec

The role of applied research for achieving the SDGs

Applied research has the capacity to generate, translate and disseminate knowledge relevant to achieving the SDGs. It can support policy-makers and other stakeholders to identify policy priorities/problems, assess policy options, implement solutions and evaluate policies. Such research can also help translate the SDGs into measurable and country-specific targets by actively matching academic knowledge with public policy priorities and making knowledge and resources readily available to governments and communities.

Research institutes can initiate and facilitate dialogue and build collaborations among multiple sectors, including government, the private sector, the academic and scientific communities, civil societies, non-governmental organisations and the public. Dialogue and collaborative efforts can help ensure commitment to and strengthen the implementation of the SDGs, as well as promote the political accountability needed to attain them.

Research institutes also have the capacity and capability to map, track and document efforts to link research to policy and practice. They can establish meaningful frameworks and metrics for identifying, measuring and reporting on the right indicators for the SDG targets. Evaluating the impact of these efforts enables the demonstration of commitment and progress to achieving the SDG goals and targets.

Communication and the SDGs

Research has a lot to offer the SDGs, but needs to be translated into practical, actionable activities and communicated to have an impact. The real difficulty for research is to go beyond communication in journals to make a difference in the lives of the beneficiaries: the citizens of each country. Meeting the challenges of disseminating knowledge and facilitating learning requires packaging and communicating research findings so that they are accessible to a lay audience, including policymakers.

Sandec and the SDGs

Sandec conducts research on innovative, evidence-based methods and technologies that improve and enable access to inclusive, sustainable sanitation, water and solid waste infrastructure and services for low- and middle-income countries. Our aim is to support, inform, and impact research, education, policy, standards, and practice towards achieving the SDGs.

Our work has five central themes:

1. **Strategic Environmental Sanitation Planning**
2. **Municipal Solid Waste Management**
3. **Management of Excreta, Wastewater and Sludge**
4. **Water Supply and Treatment**
5. **Safe Water Promotion**

Strategic Environmental Sanitation Planning (SESP) and the SDGs

SESP´s research and capacity development interventions mainly focus on **SDG 6** (Clean water and sanitation), **SDG 11** (Sustainable cities and communities) and **SDG 17** (Partnerships for the Goals). Research and capacity development focus on creating and validating approaches, frameworks and guidelines that are actionable, contextualised and policy-friendly. As part of Eawag's activities as a WHO Collaborating Centre, SESP is also developing monitoring tools that support **SDG 3** (Good Health and Well Being) and **SDG 4** (Quality Education).

SESP Projects

Our strategic planning work on basic urban service planning and programming (City-Wide Inclusive Sanitation, CLUES, and Sanitation 21) provides tangible and actionable solutions that have been utilised and implemented by numerous institutions.

Community-Led Urban Environmental Sanitation (CLUES)

The Community-Led Urban Environmental Sanitation (CLUES) method is based on a set of comprehensive guidelines for the planning and implementation of environmental sanitation infrastructure and services in disenfranchised urban and peri-urban communities. It is a multi-sector and multi-actor approach accounting for water supply, sanitation, solid waste management and storm drainage, while balancing the needs of people with those of the environment to support human dignity and a healthy life. It emphasises the participation of all stakeholders from an early stage in the planning process.

Sanitation 21: A Planning Framework for Improving City-wide Sanitation Services

Sanitation 21 is an important component of the global sanitation toolkit, which presents a planning framework based on international best practices. The document sets out key principles and process guidelines to help city stakeholders develop appropriate and affordable solutions to sanitation problems, while taking into account technology issues, management arrangements, institutional challenges and demands for improvement from different stakeholders.

Small-Scale Sanitation Scaling-Up (4S)

4S is the first systematic assessment of small-scale sanitation systems in South Asia. Its aim is to develop evidence-based policy recommendations for the successful implementation of small-scale wastewater treatment and reuse systems at scale, based on the technical evaluation of more than 300 small-scale sanitation units, as well as conducting an in-depth governance and financial analysis.

DIRECT LINK TO SDGs (in order of priority):

6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. → direct link to indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

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. → direct link to indicator 6.3.1: Proportion of wastewater safely treated

6.B: Support and strengthen the participation of local communities in improving water and sanitation management. → direct link to indicator 6.B.1: Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management

11.1: By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.

INDIRECT LINK TO SDGs (no order of priority):

By reducing the negative health impacts of waste:

> **3.9** By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

By increasing water-use efficiency:

> **6.4** By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

By increasing access to basic services:

> **1.4** By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance

By increasing involvement of local communities in WASH decision-making:

> **6.B** Support and strengthen the participation of local communities in improving water and sanitation management

The Facility Evaluation Tool for WASH in Institutions (FACET)

The Facility Evaluation Tool for WASH in Institutions (FACET) is based on globally recognised indicators and is suitable across the continuum of humanitarian and development interventions. A simple and adaptable analysis tool, FACET offers state-of-the-art online/offline

mobile data collection on an open source platform. It is an easy-to-use gender sensitive monitoring tool for WASH delivery services in health care facilities (FACET WIH) and schools (FACET WINS) and enables informing the responsible entities of the status of their sanitation infrastructure and services to help improve, manage, operate and maintain better health facilities.

DIRECT LINK TO SDGs (in order of priority):

3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all. → direct link to indicator 3.8.1: Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population)

4.A: Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all. → direct link to indicator 4.A.1: Proportion of schools with access to: … (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic handwashing facilities (as per the WASH indicator definitions)

Quality Indicators of Shared Sanitation (QUISS)

The QUISS project is conducting extensive surveys of shared toilets and their users across cities in Bangladesh, Ghana and Kenya, as well as qualitative studies. This research aims to identify key criteria of what constitutes “high quality” shared toilets in urban contexts. The analysis will also provide the basis for implementation decision making and for policy makers, and inform the current agenda-setting debate.

DIRECT LINK TO SDGs (in order of priority):

6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. → direct link to indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

17.6: Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms.

17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed.

17.9: Enhance international support for implementing effective and targeted capacity building in developing countries to support national plans to implement all the Sustainable Development Goals.

Citywide Inclusive Sanitation (CWIS)

The Citywide Inclusive Sanitation initiative (CWIS) provides an overarching academic foundation to the paradigm shift in the international development narrative about urban sanitation. With major sector players, including the World Bank, the Gates Foundation, and WaterAid among others, coordinating their efforts towards CWIS, Eawag provides fundamental research around the concept and methodology of CWIS. Rapidly urbanising cities in India, Kenya, and Nepal are the locations where the main CWIS case studies will take place. The aim of the project is to better understand current barriers in sanitation planning practices and develop a holistic methodology that bridges top-down and bottom-up planning approaches.

DIRECT LINK TO SDGs (in order of priority):

6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. → direct link to indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

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. → direct link to indicator 6.3.1: Proportion of wastewater safely treated

6.B: Support and strengthen the participation of local communities in improving water and sanitation management. → direct link to indicator 6.B.1: Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management

11.1: By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.

MSWM Projects

Towards Zero-Waste at Schools

"Towards Zero Waste at schools" (ZW@S) focuses on moving towards a "Circular-Waste" approach at school level (as a model unit). It targets learning, application and practice on circular resource management, so that students become agents of change and ambassadors for sustainable behaviour and a cleaner world with a circular economy. The ZW@S project aims to enhance and assist others wanting to introduce environmental education and effective circular economy approaches in any school setting.

It covers solid waste, WASH, and energy flows, as well as environmental (sustainable development) education. The basic approach involves a national overview (of past and existing initiatives in this field) then a selected school case study. At the school, the process involves: a) baseline assessment (material flows, behaviours and curricula), b) planning of improvements scenarios in curricula development and reduce/recycling solutions, and c) implementation/application, monitoring and adjustment phase. Participatory approaches are used throughout the whole process. Besides the technical aspects of innovative waste management solutions, research looks at behaviour change and impacts of behaviour change in "host" communities.

DIRECT LINK TO SDGs (in order of priority):

12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature. → direct link to indicator 12.8.1: Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment

4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development. → direct link to indicator 4.7.1: Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment

12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse. → direct link to indicator 12.5.1: National recycling rate, tons of material recycled.

12.2: By 2030, achieve the sustainable management and efficient use of natural resources. → some direct link to the associated indicator 12.2.1: Material footprint, material footprint per capita, and material footprint per GDP

12.3: By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses. → some indirect link to the associated indicator 12.3.1: Global food loss index.

12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment. → some indirect link to the associated indicator 2.4.2: Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment

11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality, and municipal and other waste management. → some direct link to the associated indicator 11.6.1: Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities

INDIRECT LINK TO SDGs <u>(no order of priority)</u>:

By reducing the negative health impacts of waste:

3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

By reducing the negative environmental impacts of waste:

14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

14.1.1 Index of coastal eutrophication and floating plastic debris density

By recycling waste for food production:

2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practice that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world

By recycling waste for energy production:

7.2 By 2030, increase substantially the share of renewable energy in the global energy mix

By creating jobs from recycling:

8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors

By creating innovative enterprises through recycling:

> **9.4** By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes.

Waste Flow Diagrams & SDG 11.6

This project is a collaboration with GIZ and University of Leeds and aims to develop, apply and disseminate a new material flow analysis (MFA) based tool for describing solid waste flows in cities. The results are visualised by a "Waste Flow Diagram" with special focus on the (plastic) waste leaking into water bodies (marine litter). It also aims to develop and test approaches (definitions and data acquisition methods), in relation to waste-related SDGs (11 and 12 and 14) and to offer simple guidance to municipalities, especially in low- and middle-income countries, on their application and dissemination. The tool should serve the key purposes (objectives) of:

1. Supporting municipalities in establishing baseline data for their solid waste management planning and facilitate (annual) performance monitoring related to the quantities of waste entering controlled collection, treatment and disposal.
2. Contributing to the ongoing efforts to operationalise the monitoring of the achievement of SDG targets 11.6.1 and 12.5.1, and 14.1 (informed by the SDG-related methodologies under development that may contain elements of the Wasteaware indicators).
3. Contributing to assessing the plastic waste leakage into waterways and the ocean (hence a plastic waste 'layer' will be also separately considered in combination with the entire MSW)

DIRECT LINK TO SDGs (in order of priority):

11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management. → direct link to the associated indicator. 11.6.1: Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities

14.1: By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution. → direct link to the associated indicator 14.1.1: Index of coastal eutrophication and floating plastic debris density

12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse. → some indirect link to the associated indicator 12.5.1: National recycling rate, tons of material recycled

12.3: By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses. → some indirect link to associated indicator 12.3.1: global food loss index

12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment. → some indirect link to the associated indicator 2.4.2: Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment

INDIRECT LINK TO SDGs (in order of priority):

By reducing the negative health impacts of waste:

> **3.9** By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

By reducing the negative environmental impacts of waste:

> **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.

By recycling waste for food production:

> **2.4** By 2030, ensure sustainable food production systems and implement resilient agricultural practice that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality
> **15.3** By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world

By recycling waste for energy production:

> **7.2** By 2030, increase substantially the share of renewable energy in the global energy mix

By creating jobs from recycling:

> **8.2** Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors

By creating innovative enterprises through recycling:

> **9.4** By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial process, with all countries taking action in accordance with their respective capabilities

Black Soldier Fly research (FORWARD Indonesia, SIBRE project, and PhD Moritz Gold)

FORWARD, the From Organic Waste to Recycling for Development project (SECO funded) supports local government and selected private enterprises to develop, establish and sustain black soldier fly (BSF) organic waste treatment, as well as disseminate new findings to a worldwide community. SIBRE, the Sustainability of Insect-Based Recycling Enterprises project (SwissRe Foundation funding) evaluates cost aspects of BSF treatment and explore alternative BSF product and market competitiveness.
Moritz Gold's PhD project (E4D funding) is researching optimal dietary mixes based on existing biowaste availability to achieve optimal BSFL growth and, thus, foster viable business opportunities.

DIRECT LINK TO SDGs (in order of priority):

12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse. → direct link to indicator 12.5.1: National recycling rate, tons of material recycled

12.3: By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses. → some indirect link to the associated indicator 12.3.1: Global food loss index

11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management. → some direct link to the associated indicator 11.6.1: Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities

2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practice that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

12.2: By 2030, achieve the sustainable management and efficient use of natural resources. → some direct link to the associated indicators 12.2.1: Material footprint, material footprint per capita, and material footprint per GDP

12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature. → direct link to indicator 12.8.1: Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment

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. → no direct link to the associated indicators

INDIRECT LINK TO SDGs (no order of priority):

By reducing the negative health impacts of waste:

3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

By reducing the negative environmental impacts of waste:

14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

14.1.1 Index of coastal eutrophication and floating plastic debris density

By creating jobs from recycling:

8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors

By creating innovative enterprises through recycling:

9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes with all countries taking action in accordance with their respective capabilities

Management of Excreta, Wastewater and Sludge (MEWS) and the SDGs

MEWS research and capacity development interventions are mainly targeted at understanding the characteristics of faecal sludge (FS), improving the safe management of excreta, wastewater, and sludge and enhancing the planning, design, treatment and reuse of faecal sludge to ensure a safely managed FS service chain, protect human health, and reduce the pollution of the urban environment.

MEWS Projects

Q&Q: Method to estimate quantities and qualities of faecal sludge

Research on how to best estimate the quality and quantity (Q&Q) of faecal sludge (FS) aims at improving the estimations of FS from the community to citywide scale. This would enhance FS planning, treatment and management strategies, and increase the fraction of safely managed sanitation. As part of this work, MEWS is developing a Volaser device, which can determine the volumes of FS stored underground in containments regardless of their shape.

Dewatering: Understanding governing mechanisms for improved global sanitation

Understanding the fundamental mechanisms governing dewatering behaviour will lead to improved management and treatment of FS, allowing for improved collection, transport, treatment, and safe management.

DIRECT LINK TO SDGs (in order of priority):

6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. → direct link to indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

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. → direct link to indicator 6.3.1: Proportion of wastewater safely treated

Promoting onsite sanitation and improving the faecal sludge service chain

Promotion of the use of onsite sanitation or off the grid sanitation technologies will limit the use of freshwater for sanitation purposes and improve water use efficiency over time. MEWS research is providing solutions to improve and further the sustainability of the faecal sludge service chain. This prevents contamination (indiscriminate FS disposal) and protects public and environmental health.

DIRECT LINK TO SDGs (in order of priority):

3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. → direct link to indicator 3.9.1: Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)

6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity. → direct link to indicators 6.4.1: Change in water-use efficiency over time and 6.4.2: Level of water stress: freshwater withdrawal as a proportion of available freshwater resources

The Sludge to Energy Enterprises in Kampala (SEEK)

The Sludge to Energy Enterprises in Kampala (SEEK) project provided solutions for the safe management and enduse of faecal sludge. SEEK investigated resource-recovery solutions for FS management and researched the conversion of FS to energy products, e.g., fuel pellets.

The Faecal Management Enterprises (FaME)

The Faecal Management Enterprises (FaME) project worked on developing innovative and profitable resource recovery options for FS treatment products that generate revenue and improve the FS service chain. It also identified the market potential for FS end-products.

The Partnership for Urban Resource Recovery (PURR)

The Partnership for Urban Resource Recovery (PURR) evaluated the feasibility of treating faecal sludge through anaerobic digestion. The aim was to evaluate the use of anaerobic digestion to produce safe-to-use end-products that are not harmful to the environment and that can be locally used.

The SEEK, FaME and PURR projects aim at making an important contribution to SDG 7.2.

DIRECT LINK TO SDG:

7.2: By 2030, increase substantially the share of renewable energy in the global energy mix.
→ direct link to indicator 7.2.1: Renewable energy share in the total final energy consumption

Capacity Development

Supporting and training personnel involved in sanitation management and the next generation of faecal sludge managers. This is done through teaching at universities (EPFL, ETH and IHE Delft), doing workshops at conferences (FSM Conferences), producing an online course (MOOC) to disseminate information on faecal sludge management, and publishing the books: Faecal Sludge Management: Systems Approach for Implementation and Operation, and Faecal Sludge Management: Highlights and Exercises.

DIRECT LINK TO SDGs (in order of priority):

6.A: By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

6.B: Support and strengthen the participation of local communities in improving water and sanitation management. → direct link to indicator 6.B.1: Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management

17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed.

4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

Evaluation and Monitoring of Faecal Sludge Treatment Plants (eFSTP) in South Asia and Sub-Saharan Africa

The eFSTP project conducted field evaluations of faecal sludge treatment plants in South Asia and Sub-Saharan Africa with the aim to make evidence-based recommendations and guidelines to optimise the design, operation, maintenance and management of faecal sludge treatment plants. The project will provide sound empirical evidence for future faecal sludge management investments to ensure the safe management of FSTPs and improve the provision of citywide FS treatment services.

DIRECT LINK TO SDGS (in order of priority):

6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. → direct link to indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

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. → direct link to indicator 6.3.1: Proportion of wastewater safely treated

6.A: By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births. → direct link to indicators 3.2.1: Under-five mortality rate and 3.2.2: Neonatal mortality rate

3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.

3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

3.13: Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.

9.4: Develop quality, reliable, sustainable and resilient infrastructure**,** including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.

9.6: Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States.

9.7: Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities.

11.1: By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.

11.3: By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.

11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.

11.8: Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning.

INDIRECT LINK TO SDGs <u>(no order of priority)</u>:

By reducing the release of wastes in air, water and soil:

> **12.4** By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

By enhancing North-South cooperation:

> **17.6** Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism

By promoting knowledge transfer:

17.6 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed

By supporting countries to reach the SDGs:

17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation

By furthering policy development:

17.14 Enhance policy coherence for sustainable development

By enhancing global partnerships:

17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries

By promoting public and private partnerships:

17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships

By supporting the development of measurable indicators:

17.19 By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries

Water Supply and Treatment (WST) and the SDGs

The WST group´s research and capacity development efforts mainly focus on **SDG 6** (Clean water and sanitation). Additionally, the top five SDGs linked to WST activities are: **SDG 1** (No poverty), **SDG 3** (Good health and well-being), **SDG 4** (Quality education), **SDG 5** (Gender equality), and **SDG 17** (Partnerships for the Goals).

WST Projects:

REACH, SMALL, Water quality testing tools and developing low-cost incubator

The REACH project is establishing a risk-based water safety strategy for piped water supplies in the Mid-Western Region of Nepal. It is evaluating how comprehensive WASH promotion can complement piped scheme upgrades. The goal is to demonstrate a viable approach to achieving effective water safety planning and developing viable solutions for the monitoring and removal of faecal contamination from drinking water supplies for rural communities in alpine settings.
Project SMALL aims to support the development of applicable and sustainable water and sanitation provision models for small towns in Sub-Saharan Africa. The research aims to assess existing models of water and sanitation provision in small towns with the aim to develop new models that result in more sustainable water and sanitation services.
Development of improved tools for water quality testing, e.g., field validation of the RUG™ media for E. coli detection.
Developing an adaptable, low-cost and portable incubator for microbial testing of drinking water quality in areas with limited water quality monitoring resources. This kind of incubator can be built using readily available materials and combines the advantages of both conventional and field-based models.

DIRECT LINK TO SDGs (in order of priority):

3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births. → direct link to indicators 3.2.1: Under-five mortality rate and 3.2.2: Neonatal mortality rate

6.1: By 2020, achieve universal and equitable access to safe and affordable drinking water for all. → direct link to indicator 6.1.1: Proportion of population using safely managed drinking water services

6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. → direct link to indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation. → direct link to indicators 6.5.1: Proportion of wastewater safely treated and 6.5.2: Proportion of bodies of water with good ambient water quality

6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes. → direct link to indicator 6.6.1: Change in the extent of water-related ecosystems over time

Multiple-use Water Services Impact Evaluation (MUS)

The Multiple-use Water Services Impact Evaluation project is looking at the costs and benefits of programmatic approaches in support of multiple-use water services for rural communities. The purpose is to systematically and rigorously evaluate how MUS impacts the health and well-being of rural households in the project area.

DIRECT LINK TO SDGs (in order of priority):

1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance. → direct link to indicator 1.4.1: Proportion of population living in households with access to basic services

3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births. → direct link to indicators 3.2.1: Under-five mortality rate and 3.2.2: Neonatal mortality rate

Identifying factors that enable on-plot water services that reduce water fetching burden

Access to pre-school and primary education is hindered by unreliable access to drinking water sources, since children (especially girls) are often responsible for water fetching. WST research on identifying and supporting the factors that enable sustained functionality of on- plot water services, thereby reducing the household water fetching burden,

DIRECT LINK TO SDGs (in order of priority):

4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.

4.2: By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education.

Improving access to on-plot water services and community participation in water planning

As the primary managers of household water supply, women and girls are most affected by WASH interventions. The WST group researches applicable solutions for improving access to

on-plot water services in rural areas, and is working on increasing equitable community member participation in water system planning, construction and operation.

DIRECT LINK TO SDGs (in order of priority):

5.4: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate. → direct link to indicator 5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location

5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life. → direct link to indicator 5.5.2: Proportion of women in managerial positions

Capacity development

WST contributes to capacity development through face-to-face training (e.g. drinking water testing training sessions in Nepal, MSc student training in stats internally at Sandec, etc.) and through our open online courses (MOOC on household water treatment).

DIRECT LINK TO SDGs (in order of priority):

17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed.

17.9: Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation.

Safe Water Promotion (SWP) and the SDGs

The SWP group´s research and capacity development efforts mainly focus on **SDG 6** (Clean water and sanitation). Additionally, five other SDGs are linked to SWP activities: **SDG 1** (No poverty), **SDG 3** (Good health and well-being), **SDG 4** (Quality education), **SDG 5** (Gender equality), and **SDG 17** (Partnerships for the Goals).

SWP Research

SWP research focuses on improving access to safe drinking water at the point of consumption and improving hygiene, by:
Developing and evaluating strategies to provide safe drinking water at the point of consumption including approaches to reduce recontamination of drinking water during transport and storage at the household level
Evaluating different automatic chlorination options at water kiosks in Uganda and in rural water supply schemes in Nepal.
Analysing the impact of different water quality and hygiene interventions on children's health in Nepal
Developing a UVC LED device for water disinfection on the household level
Evaluating the technical performance, design and handling of different types of household filters in the emergency context as well as in a remote rural context
Analysing the impact of carrying water on women's health

DIRECT LINK TO SDGs (in order of priority):

6.1: By 2020, achieve universal and equitable access to safe and affordable drinking water for all. → direct link to indicator 6.1.1: Proportion of population using safely managed drinking water services

3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births. → direct link to indicators 3.2.1: Under-five mortality rate and 3.2.2: Neonatal mortality rate

3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases. → direct link to indicator 3.3.5: Number of people requiring interventions against neglected tropical diseases

3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. → direct link to indicator 3.9.2: Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)

6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. → direct link to indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed.

4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

5.4: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate. → direct link to indicator 5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location

5.1: End all forms of discrimination against all women and girls everywhere.

Gravity-driven Membrane Filtration (GDM) Project

This project is testing the viability of gravity-driven membrane technology at the community level at water kiosks and training the local community in its operation and management. The kiosks treat water from Lake Victoria to provide safe and quality drinking water, and provide an income to local people involved in their management and operation. The water kiosks are located on the compounds of local schools, and the project also provides the students with education and high quality lectures on various WASH topics, such as drinking water treatment at household level and adequate hygiene, i.e. sanitation management and hand-washing. Women in the community who had to carry water to their homes over long distances can now fetch the water required at a much closer distance.

DIRECT LINK TO SDGs (in order of priority):

6.1: By 2020, achieve universal and equitable access to safe and affordable drinking water for all. → direct link to indicator 6.1.1: Proportion of population using safely managed drinking water services

1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance. → direct link to indicator 1.4.1: Proportion of population living in households with access to basic services

6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. → direct link to indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births. → direct link to indicators 3.2.1: Under-five mortality rate and 3.2.2: Neonatal mortality rate

3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. → direct link to indicator 3.9.2: Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)

4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.

4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

5.4: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate. → direct link to indicator 5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location

9.1: Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.

17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed.

17.9: Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation

17.16: Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries.

Analyse the impact of different water quality and hygiene interventions on children's health in Nepal

This project is implementing three different interventions that aim at improving drinking water quality and hygiene and therewith particularly children's health in rural households in Nepal. The three interventions are: a) passive chlorination in rural water supply schemes, b) the promotion of household water filters and improved handling thereof and c) household hygiene education activities. The study is comparing the impact of these interventions on children's burden of water-borne diseases (diarrhoea and intestinal parasitic infections), malnutrition and nutritional deficiencies.

DIRECT LINK TO SDGs (in order of priority):

6.1: By 2020, achieve universal and equitable access to safe and affordable drinking water for all. → direct link to indicator 6.1.1: Proportion of population using safely managed drinking water services

6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. → direct link to indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births. → direct link to indicators 3.2.1: Under-five mortality rate and 3.2.2: Neonatal mortality rate

3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases. → direct link to indicator 3.3.5: Number of people requiring interventions against neglected tropical diseases

3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. → direct link to indicator 3.9.2: Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)

17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed.

Analyse the impact of carrying water on women's health

This project is assessing the impact of women carrying their water from the source to the household on their health. Significant health and economic benefits can be expected if access to safe drinking water is provided at the household level instead of community level. First, household water access will increase the amount of water available for hygienic practices in the household therewith reducing the amount of pathogens in the household environment. Second, drinking water itself will be less prone to recontamination during transport and storage if it can be collected at the tap in the household, and third, the tremendous work and health burden women are facing to transport water from the water supply point in the community to their homes will be reduced.

DIRECT LINK TO SDGs (in order of priority):

6.1: By 2020, achieve universal and equitable access to safe and affordable drinking water for all. → direct link to indicator 6.1.1: Proportion of population using safely managed drinking water services

6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations. → direct link to indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

5.1: End all forms of discrimination against all women and girls everywhere.

5.4: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate. → direct link to indicator 5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location

3.1: By 2030, reduce the global maternal mortality ration to less than 70 per 100,000 live births. → direct link to indicator 3.1.1: Maternal mortality ratio

3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births. → direct link to indicator 3.2.2: Neonatal mortality rate

10.2: By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status.

10.3: Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard.

Crosscutting Issues

A. EAWAG-WHO Collaborating Centre

The World Health Organization (WHO) Collaborating Centres include research institutes, universities departments, and other organizations designated by the Director-General to carry out activities in support of its programmes. In 2016, WHO approved the re-designation of Eawag as a "WHO Collaborating Centre for Sanitation and Water in Developing Countries", and Eawag undertakes joint activities related to water, sanitation, and global health.

SESP activities to support Eawag's WHO Collaborating Centre status involves contributing to harmonised indicators and core questions to collect data on "basic" drinking water, sanitation and handwashing for comparable national coverage estimates and SDG monitoring. SESP informs the current monitoring framework in two focus areas: refinement and applicability of WASH indicators in institutional settings and development of quality indicators for shared sanitation facilities in urban low-income settlements.

WSP also contributes generally to Eawag's activities as a WHO Collaborating Centre. It is serving as an external expert reviewer of the forthcoming revision of the Guidelines for Small Community Water Supplies and as co-author of the forthcoming Compendium of Drinking Water Systems and Technologies.

DIRECT LINK TO SDGs (in order of priority):

3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. → direct link to indicator 3.9.2: Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)

4.A: Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all. → direct link to indicator 4.A.1: Proportion of schools with access to: … (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic handwashing facilities (as per the WASH indicator definitions

6.A: By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

6.B: Support and strengthen the participation of local communities in improving water and sanitation management.

B. Digital Learning Programme

Sandec's newly designed Digital Learning Programme continues and expands our capacity development initiatives. These include online courses, blended learning programmes and face-to-

face training workshops developed to meet the ever-increasing demand for WASH education in low-and middle-income countries. The flagship is the Eawag/EPFL MOOC Series “Sanitation, Water and Solid Waste for Development”. The online courses run 24/7 and provide free and unlimited global access to high-quality WASH education. To date, the MOOC-series has reached more than 100’000 enrolled learners, and has a growth rate of approximately 1’200 new learners per month.

The blended learning programmes combine online and face-to-face learning. They are designed and implemented with partner universities and training centres in Africa, Asia and Latin America. This educational method has proven to be a very effective and partner- oriented way of fostering capacity development collaborations.

With its global reach, the digital learning programme gives worldwide visibility to Eawag, and is highly regarded in the WASH sector. It contributes to Eawag’s reputation as a leading institute for research and education in aquatic science and technology. It also aims at making an important contribution to the Sustainable Development Goals, particularly to target 6A.

DIRECT LINK TO SDG:

6.A: By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.