



UN-HABITAT

Setting the agenda for safe and sustainable wastewater management and monitoring in the context of the SDGs

POLICY BRIEF



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This series of webinars was made possible by the active participation of our partners from the League of Arab States/Arab Ministerial Water Council, the African Water and Sanitation Academy and the African Water Association, the African Ministers' Council on Water, the African Development Bank, the Eastern and Southern Africa Water and Sanitation Regulators Association, the Caribbean Water & Sewerage Association, the Caribbean Development Bank, the Inter-American Development Bank and the Asian Development Bank. The report also benefited from substantive reviews from Maren Heuvels from the German Agency for International Cooperation, Kate Medlicott, Rick Johnston and Andrew Shantz from the World Health Organization and Carina Tomassen and Lars Stordal from GRID-Arendal.

Cover photo

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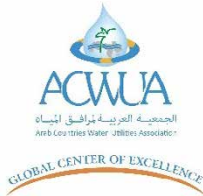
POLICY BRIEF

This policy brief highlights the crucial importance of improving wastewater management and monitoring for a range of development objectives. It builds on the commitment made at the UN 2023 Water Conference and on the outcomes of a series of five regional webinars convened by the United Nations Human Settlements Programme (UN-Habitat) and regional co-organizers between 2020 and 2023 in Africa, the Arab Region, Asia, the Caribbean and Latin America, which explored regional practices on wastewater monitoring and discussed how to strengthen policy development and decision-making for investment in wastewater management. These webinars involved more than 100 countries and 141 water and sanitation utilities, regional water associations, regulators, line ministries, development partners, academic institutions and others from public and private sectors. They were followed by data-collection exercises conducted by regional co-organizers to support national institutions in their efforts to report accurately on Sustainable Development Goal (SDG) indicator 6.3.1 and enhance water and wastewater monitoring worldwide.

Regional co-organizers:



Africa



The Arab Region



Asia

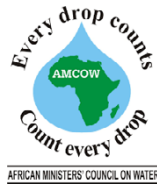


The Caribbean



Latin America

Regional partners and participating organizations:



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Summary for policy-makers

The need for a new paradigm for wastewater management and monitoring

- In the 2030 Agenda for Sustainable Development, United Nations Member States committed to engaging in a systematic follow-up and review of progress towards the goals and targets, using a dedicated set of global indicators. SDG indicator 6.3.1 (“Proportion of domestic and industrial wastewater flows safely treated”) put wastewater¹ at the forefront of the global development agenda for the first time, with the objective of reducing the hazardous impacts of water pollution on the people and environmental systems that receive discharges. It provides a unique opportunity to better assess the flows of wastewater generated by households and economic activities, and of the volumes of treated wastewater being discharged in the environment at the national, regional and global levels.
- The 2021 Progress Update on Wastewater Treatment (SDG 6.3.1)² presented the national statistics provided by the governments of all 193 United Nations Member States, showing that, in 2015, there was no official information available on the proportion of total wastewater treated for 80 per cent of the world population, or for the proportion of industrial wastewater treated for 95 per cent of the world population, as reported by national statistical offices to the United Nations Statistics Division/United Nations Environment Programme, the Organisation for Economic Cooperation and Development and the Eurostat databases.
- The enhanced monitoring of the SDG indicator 6.3.1 could improve our knowledge of wastewater flows generated by not only domestic but also industrial and commercial activities, and of the discharge of treated and non-treated wastewater flows into the environment.
- Decision makers and stakeholders from the water sector urgently need more reliable and disaggregated wastewater statistics to strengthen coordinated policy planning and make informed decisions on water resource allocation and investment to rapidly foster environmental, social, economic and institutional benefits.
- While wastewater treatment is generally an invisible and neglected service, a paradigm shift in intersectoral wastewater management could greatly contribute to human well-being and the protection of the environment and biodiversity, while significantly leveraging circular economy through wastewater reuse and nutrient recovery.
- Improving wastewater management is not only fundamental for safe and sustainable water use and protection of the environment and public health against hazardous pollutants; it also contributes to sustainable development, climate change mitigation and adaptation, and peace and security. Safe wastewater treatment and reuse can indeed increase freshwater resources and protect their quality, whereas improved wastewater treatment and resource recovery can reduce the large amounts of energy consumed in the treatment processes, as well as greenhouse gas emissions produced by the wastewater sector.

¹ “Wastewater” here refers to used water from any combination of domestic, industrial and commercial activities, surface run-off or stormwater and any sewer inflow or infiltration conveyed in a sanitary sewer or transported in a combined sewer and treated at a municipal wastewater treatment plant. For working purposes, our definition of wastewater includes septage and fecal sludge from septic tanks when treated at a municipal wastewater treatment plant.

² See <https://www.unwater.org/publications/progress-wastewater-treatment-2021-update>.

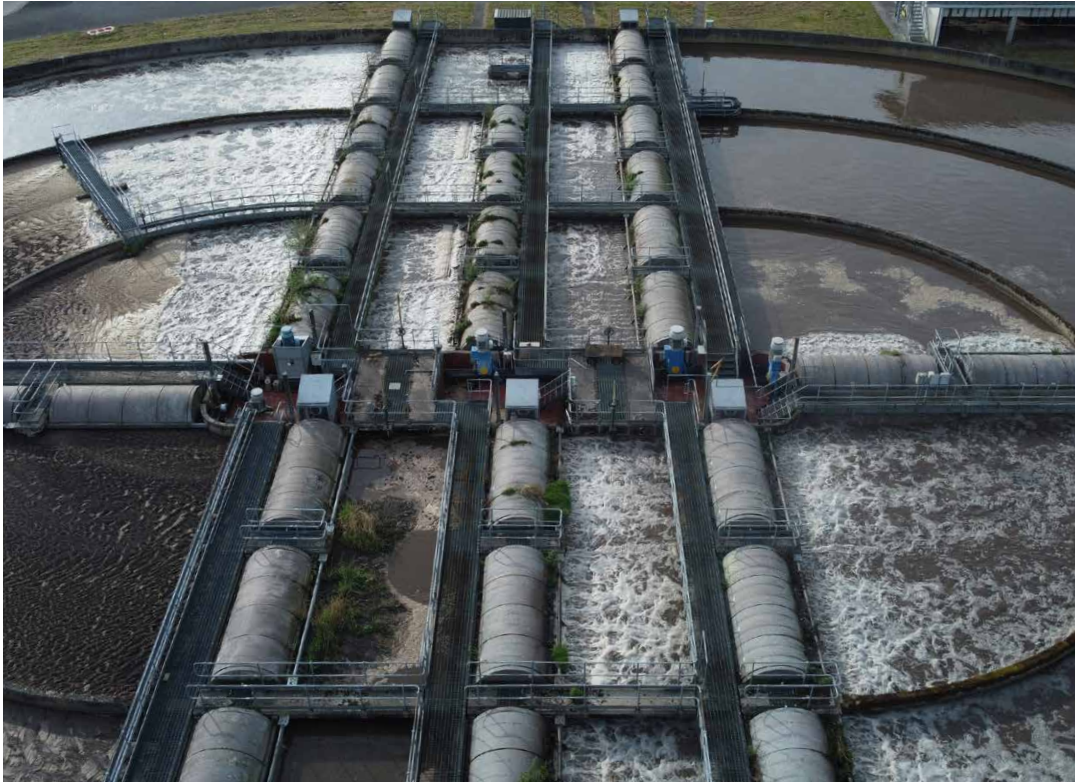
Priority actions and policy recommendations

Wastewater data collection and management

- There is a strong need for capacity-building effort in terms of infrastructure development and maintenance, including improvement of laboratory facilities for wastewater quality and quantity monitoring, from basic wastewater data-collection tools to information technology software applications and tools. More financial resources should therefore be allocated to hiring and training staff to work on data monitoring and management, perform statistical analysis and report the monitored data to centralized institutions.
- Capacity-building must also focus on the development of national/regional mechanisms and information management systems to streamline standardized data collection, to include additional data e.g. on service coverage and prices, as well as on public reporting within relevant institutions, such as national statistics offices, line ministries, regulators and operators.
- Wastewater statistics must be collected and analysed more effectively to inform national decision-making, improve operation and maintenance, reduce the possibilities of environmental contamination and ultimately attract more finance and support to an area of the water cycle that has been neglected in many parts of the world in the last few decades.
- There is a striking lack of wastewater data from industries, many of which use their own raw water sources such as rivers and groundwater wells, which are generally not included in public statistics. The monitoring effort must therefore actively include non-domestic sources to develop more detailed inventories of water uses and pollutant loads discharged into the environment, as well as implementation of sustainable resources management and implementation of the 'polluter pays' principle.

Governance and policies for wastewater management

- A high number of actors are involved in the provision and regulation of wastewater management for both sewerage and on-site sanitation, from ministries, utilities and regulators at the national level to municipal authorities and private service providers at the local level. Such fragmentation can hinder planning, budgeting, financing and subsequent investment that can significantly increase sanitation coverage. There is therefore a need to improve coordination between the various actors and sectors, and for a clear service delivery and institutional regulation framework that eliminates gaps and overlaps in mandates between service providers and regulators.
- There is a real need to advocate for policy and legislative reforms in the wastewater sector. Wastewater treatment is an essential service for which governments are responsible and can be held accountable. It should therefore be supported through a legislative framework and policies, and a simple, transparent and effective regulatory and enforcement environment.
- Given the effects of climate change on water resources, treatment of wastewater should be part of countries' national action plans, investment plans and water budgets. Planning for wastewater reuse should be considered early in the urban planning process. There is also a need to develop specific guidelines and standards for wastewater and sludge reuse, and to harmonize regional standards for nutrient levels in sewerage effluents across the several potential users, to enhance social acceptance of wastewater reuse, and to improve the regulations of industrial wastewater treatment.



Financing and investment in wastewater

- Wastewater seems unattractive to investors as compared to water supply, while most funding for sanitation comes from households themselves. There is a frequent lack of strategies and clarity in national development plans for attracting investments, which impedes on the availability of large investment streams from the sector. In low-income countries, non-sovereign water operations and the private sector must therefore play a more important role in balancing capital investments and operation and maintenance investments. Strategies to obtain operation and maintenance funds need to be internally sourced to secure funds for sustainable operation of the existing facilities.
- Various forms of repayable finance, such as loans, bonds and other financing instruments, can be mobilized. Governments can enter public-private partnerships to access financing and expertise from the private sector.
- There is a need to create smart subsidies and provide incentives to attract private sector investment in reuse and resource recovery, and to improve the financial efficiency and sustainability of utilities. Investing in wastewater and end product recovery can help reduce the operation costs of wastewater treatment facilities, with the sale of treated wastewater, biogas, or fertilizers through nutrients recovered from sewage sludge.
- The establishment of well-structured tariffs and a strengthened regulation framework is a major milestone in monitoring the service provider and private sector with an approach based on transparency and fairness approach. Public-private partnership contracts should transfer some risk to the private sector, and incentives should be offered to polluting industries to promote on-site treatment.

1.

Introduction and objective

Background

Most of the world's population is increasingly being exposed to water scarcity and water shortage situations, floods and extreme rainfall events. Many cities are facing serious challenges in providing adequate water supply and wastewater services to their residents and economies. In addition to an increasing water demand exacerbated by global warming, the world also faces an invisible crisis of water quality that is threatening human health, biodiversity and ecosystem services. It is imperative to recognize that inadequate disposal of domestic and industrial wastewater effluents can strongly limit sustainable economic development. Additionally, it poses challenges to fulfilling human rights obligations regarding the rights to water and sanitation, and to the enjoyment of a safe, clean, healthy and sustainable environment.

Safe wastewater management and reuse at the local, national and regional levels could be important in not only meeting increasing water demands, but also better protecting human health and biodiversity, by limiting the discharge of hazardous pollutants into the environment. Ensuring adequate and affordable water and wastewater services in urban (including informal settlements) and rural areas can represent a massive challenge for low- and middle-income countries due to the financial investments required. However, there are a wide range of technical solutions, including low-cost alternatives and nature-based solutions, which should be tailored to specific environmental, political and socioeconomic

contexts. Such a paradigm change necessitates not only technical and financial capacities, but also clear developed legislations and regulations supported by good governance practices, as well as a supportive policy and institutional context.

Although much attention was paid in the Millennium Development Goals to improving access to sanitation and faecal sludge management in low-income countries, there remains a substantial knowledge gap on (sewer) wastewater flows originating from various sectors of the economy in most countries. The 2030 Agenda and the adoption of the Sustainable Development Goals (SDGs) dedicated SDG 6 to water and sanitation, with its target 6.3 setting out to improve ambient water quality by eliminating, minimizing and significantly reducing different streams of pollution into water bodies.

SDG indicator 6.3.1, on monitoring the proportion of domestic, total and industrial wastewater flows safely treated, provides further opportunity and momentum to highlight why authorities ought to produce wastewater statistics for better decision-making and for the benefit of providing their citizens with better services and livelihoods. In fact, the relative lack of knowledge on wastewater flows represents a key impediment to designing integrated catchment management and urban master plans, and a failure to respond to the ongoing water crises under climate change scenarios and growing freshwater demands.



The objective of this policy brief

The UN 2023 Water Conference held in New York in March 2023 led to the adoption of the Water Action Agenda, which represents the voluntary commitments of nations and stakeholders to achieve the SDGs and their water-related targets. The United Nations Human Settlements Programme (UN-Habitat) and the Government of Ghana presented a commitment on behalf of several actors determined to strengthen wastewater monitoring in the context of SDG 6 (See BOX 1). Aligned with this commitment, the present policy brief aims to foster greater attention to wastewater management in global development policy. In 2020–2023, UN-Habitat partnered with regional water associations, operators and regulators, ministries, development partners, academic, public and private sectors, to organize a series of five regional webinars on “Setting the Agenda for Wastewater Treatment and Monitoring in the Context of the SDGs” in Africa, the Arab Region, Asia, the Caribbean and Latin America. Furthermore, high-level webinars were organized to advocate for the importance of wastewater monitoring to decision-making in investment and policy development. The objective of this initiative was to build awareness of some of the most critical aspects of wastewater management and to support countries in reporting wastewater statistics at the national level, to improve global monitoring of SDG indicator 6.3.1.

This policy brief provides the rationale for fostering integrated and transparent, participatory and accountable wastewater management at the local and national levels, to generate synergies and important environmental and economic benefits, and to promote further actions for ensuring sustainable and equitable water resources management. It presents the outcomes and key recommendations of the series of webinars, with the aim of increasing understanding and awareness of the positive impacts that improved wastewater management and monitoring can bring to vital sectors, including institutional capacity and governance, environmental and public health, climate change adaptation and mitigation, increasing urbanization and water security, the human right to water and sanitation and to a safe environment, and policy planning and investment. It first identifies the scope of problems by presenting some challenges, drivers and impacts related to wastewater management in the aforementioned focus areas. It also outlines key actionable policy recommendations, with the aim of fostering a more widespread interest in wastewater management and monitoring, as needed to achieve the SDGs.

Wastewater 2030: Striving for a circular economy in a climate-resilient world – a commitment for the UN 2023 Water Conference

Wastewater is the forgotten part of the water cycle. The situation is critical in a range of countries at different stages of development. A global transformation is essential, with more attention paid to wastewater management as part of a circular and resilient economy and as a foundation for any water-related development policy. The monitoring of SDG indicator 6.3.1 on wastewater collection and treatment must be significantly strengthened to enable tracking of global progress.

Extreme climate events are impacting wastewater management in terms of both adaptation and mitigation. Wastewater treatment systems are often outdated and not designed to deal with these extremes. As a result, floods create health hazards and pollution, while valuable resources are wasted in periods of drought, since wastewater cannot be treated and reused. Without addressing this now, we can only expect deterioration and development of crisis situations.

As actors responsible for improving wastewater management and reducing negative impacts, we propose the following five key areas to address:

Tackling wastewater pollution from all sources

To better understand and quantify the problem of wastewater pollution and make informed decisions on its management, we need to strengthen the monitoring capacity of responsible authorities. This will include central government ministries, local and regional governments, environmental protection agencies, water operators and affected communities. Involving

built environment professionals such as engineers, planners and architects is also crucial. Monitoring must cover all wastewater sources and consider their interconnectedness with solid waste management and drainage systems to account for their combined environmental impact. Apart from safely managing excreta, it is also crucial to address emerging and persistent pollutants such as microplastics in wastewater sources.

Promoting climate-resilient wastewater infrastructure

Extreme weather events, fuelled by global climate warming, have highlighted a major issue: our wastewater management infrastructure is severely inadequate to cope with stormwater inundation, particularly in the many existing combined systems. Worldwide, several wastewater treatment systems have been designed to divert stormwater flows, effectively bypassing treatment, thus resulting in uncontrolled pollution and contamination of water sources and natural resources. During extreme droughts, treating and reusing marginal-quality water can help to augment scarce fresh water.

Climate change has catalysed new thinking for the water and sanitation sector. We must take the opportunity to revisit wastewater management, and modify, retrofit and overhaul existing systems. Nature-based solutions can support win-win situations where treatment costs (including energy) are reduced while system capacity for stormwater management is improved. Additionally, less energy-intensive treatment could reduce greenhouse gas emissions.

Adopting a new inclusive policy for wastewater

The wastewater sector has long been divided, treating wastewater and excreta from on-site systems differently to those from off-site, networked solutions. Aside from technical options, institutional responsibility is often fragmented, translating into ‘no responsibility’. Many countries manage most wastewater sludge with on-site sanitation, wastewater treatment by-products and septage under different governance structures. More inclusive citywide approaches, adapted to the context, are needed. Better local-level management can improve national-level impacts. We should consider reusing wastewater and excreta as a readily available and cost-effective resource. Recent research has shown that there may be complex relationships between gender and wastewater that we have yet to understand.

Promoting good practices and stimulating investment

Although a significant body of knowledge already exists on wastewater management, new approaches to collecting and treating wastewater are emerging. Technological advancements and new governance methods demonstrate greater alignment, productivity and efficiency. Corporate social responsibility partnerships are growing and affected communities are playing their role by actively monitoring and protecting their environments. However, the sector has historically been underfunded, and we must reverse the industry’s conservatism by investing strategically in domestic resource allocation and official development assistance. Wastewater-based epidemiology also improves our ability to predict and manage future health pandemics. Unfortunately, there is a lack of platforms for sharing information and integrating new approaches into teaching and research curricula.

Towards a more aligned international effort on wastewater

The organizations behind this commitment have made significant contributions and progress in wastewater management. With the continued support of the co-custodians of SDG 6.3 and other related SDGs, we have agreed to meet regularly, consult, consolidate our findings and make a more concrete commitment to wastewater management globally. We will share our findings at appropriate forums and seek additional financial resources to achieve our goals. We also will meet annually to review our commitment and strive for a more inclusive and productive approach to wastewater management.

Convenors

- United Nations Human Settlements Programme (UN-Habitat), the Environmental Protection Agency of Ghana and the French Water Partnership

Partners

- Ministry of Environment, Science, Technology and Innovation – Ghana
- Ministry for Europe and Foreign Affairs – France
- Ministries of Ecological Transition and Territorial Cohesion – France
- Ministry of Health – Costa Rica
- Ministry of Environment – Uruguay
- Ministry of Water and Environment – Uganda
- Ministry of Sustainable Development, Climate Change and Disaster Risk Management – Belize
- Ministry of Public Works, Transportation and Communications – Haiti
- Ministry of Natural Resources and Environment – Thailand
- National Water and Sanitation Agency – Brazil
- Greater Paris Sanitation Authority – France
- Africa Global Networks – South Africa
- GRID-Arendal – Norway

2.

Protecting water resources and public health from wastewater pollution

Scope of problems

In addition to increasing water needs and climate change impacts on the availability and the distribution of freshwater resources, the world also faces an invisible crisis of water quality which has, to date, attracted significantly less attention than the ongoing water quantity crisis.

The degradation of the planet's limited freshwater resources is threatening human and ecosystems' health, representing a major concern for the sustainability of drinking water resources, socioeconomic development and sustainable food production, security and safety, and thereby for the realization of several SDGs.

The contamination of water bodies by inadequately treated domestic and industrial wastewater is a worldwide problem that does not exclusively concern low-income countries that lack wastewater treatment facilities, but also industrialized societies where highly populated centres draw their supplies of drinking water and need to improve their industrial sewage, excreta and sludge management practices.

Wastewater treatment plants that generally also collect non-domestic (including industrial) wastewaters can represent the main point sources of contaminants, including many of emerging concern (such as drug residues and microplastics), affecting ambient water quality. Treated effluents enriched with persistent toxic micropollutants not sufficiently removed through conventional tertiary treatment processes pose a further environmental threat due to their potential bioaccumulation in organisms.

In future climate change scenarios, where many river ecosystems will become more stressed during the dry seasons, discharge of wastewater into water streams may become even more critical in maintaining ecosystems' health and environmental flows. Moreover, for the same reason, the polluted effluents will be less diluted by the receiving systems, causing the wastewater flows and associated pollutant loads to proportionally increase the burden of pollution in the receiving waters.

Opportunities and policy recommendations for action

Improving wastewater treatment is fundamental for protecting aquatic ecosystems and natural drinking water resources from faecal contamination and waterborne diseases, and from hazardous pollutants that adversely affect biodiversity and public health through the contaminated food chain.

There is need for inventories of polluters from which data on methods of treatment and collection can be generated, to apply policies on safe collection and treatment of wastewater generated by households, services and industries. This can also help prioritize heavy polluting industries such as oil refinery, mining and manufacturing to carry out pretreatment and connect to effective municipal wastewater treatment systems.

Developments in response to the COVID-19 pandemic have demonstrated the utility of wastewater-based disease surveillance for monitoring SARS-CoV-2 RNA in municipal sewers and utilities. While wastewater-based epidemiology can improve our

ability to predict and manage future health pandemics, it requires platforms for sharing information and integrating new approaches into teaching and research curricula.

Technical end-of-pipe solutions, such as wastewater treatment plants, can be adequate to mitigate pollution. Although these are complex and costly, addressing pollution at the source can significantly reduce the costs and adverse impacts of hazardous pollutants discharged into the environment.

Adapting and improving wastewater treatment while assessing the physiochemical and biological characteristics of effluents can permit their suitability for irrigation and other uses.

The water quality parameters routinely monitored in wastewater treatment plants' effluents should also be monitored in the environment, to evaluate the impacts of treated effluent discharge on ambient water quality, aquatic organisms, irrigated soils, cultivated crops and the humans affected by waterborne pathogenic diseases.



Rob Barnes/GRID-Arendal

3.

Climate-resilient wastewater management

Scope of problems

Global climate warming is strongly affecting the availability and distribution of freshwater resources and thus the livelihoods and well-being of societies worldwide. In future climate change scenarios, discharge of treated wastewater into receiving streams and recycling of wastewater may become even more crucial in responding to growing water demands and ensuring vital environmental flows in periods of drought.

The discharge of large volumes of contaminated effluents and urban stormwater into the environment contributes to the burden on drinking water production and aquatic ecosystems health.

Treated wastewater receives inadequate recognition as a manageable and renewable source of irrigation water, nutrient for food production, and energy and construction material. Therefore, the willingness to pay for wastewater collection and treatment, as well as monitoring, is generally low.

Wastewater and its sludge components are important sources of methane, nitrous gas and carbon dioxide when treated or disposed of anaerobically, while wastewater treatment processes require large energy consumption and thereby have a consequent carbon footprint.



Rob Barnes/GRID-Arendal

Opportunities and policy recommendations for action

Improved wastewater treatment can significantly contribute to the reduction of greenhouse gas emissions. The valorization of the large and increasing quantities of sewage sludge produced worldwide can represent an important local, sustainable and renewable combustible source, to produce biogas, electricity, or be used as building material or in the composition/production of concrete.

Energy recovery from wastewater systems should provide an increasing part of the electricity required for municipal wastewater treatment, with the triple benefit of reducing wastewater-related emissions, producing sustainable, local and renewable energy sources and mitigating environmental pollution.

Improvement of the monitoring and management of wastewater flows by economic sectors should be incorporated into national adaptation strategies and plans to increase society's resilience to climate change and implement equitable and sustainable IWRM.

The paradigm shift in which wastewater is considered a valuable resource is crucial for protecting water sources and increasing water supply. Agriculture is by far the

most important reuse option in terms of volume and potential, and irrigation with (adequately) treated wastewater in agriculture should be promoted and explained to be accepted by farmers and consumers.

Although wastewater and sludge reuse, in contrast to potable water, has no universal standards, it should be regulated and aligned with local/national quality standards for protecting human health and the environment. There is also a strong need for capacity-building in the field of wastewater treatment and reuse, and some need for advocacy to enhance social acceptance.

The wastewater sector needs to integrate disaster risk reduction and climate risks into the design of sustainable systems and infrastructures, as water sources need to be protected against contamination by wastewater effluent overflow (and sewer system obstructions) in case of heavy rains or industrial accident.

There is a crucial need to assess, at the river-basin level, how climate change is affecting freshwater resources, both quantitatively and qualitatively, to ensure sufficient availability throughout the year and in the long term for different users.



Lawrence Hislop/GRID-Arendal

4.

Municipal wastewater services and urban water security

Scope of problems

Most of the world's population live in urban agglomerations, with many urban dwellers already facing an increasing water and sanitation crisis that threatens urban water security in small villages, towns, cities and megacities alike.

According to the Intergovernmental Panel on Climate Change, typhoons, hurricanes and other extreme weather events may become more frequent and intense due to global climate warming, and may threaten water and food security while increasing the risk of conflicts and epidemics.

The impacts of climate change on water systems are most keenly felt in urban settlements. In addition, poor water quality is heavily impacting high-density unplanned settlements and refugee camps with poor access to water, sanitation and hygiene

(WASH), potentially causing outbreaks of waterborne diseases such as cholera, typhoid and hepatitis.

Safe drinking water and adequate sanitation are essential to ensure that cities and towns grow sustainably. Extending these services to currently unserved urban dwellers will play a key role in making cities and human settlements inclusive, safe, resilient and sustainable as envisaged in SDG 11 on "sustainable cities and communities".

The water and wastewater management sector undergoing decentralization processes in cities of low- and middle-income countries can face additional governance challenges, which require strong capacity-building efforts and financial support for adequate wastewater management and treatment.

Opportunities and policy recommendations for action

Goal 11 and the New Urban Agenda reflect Member States' commitments to making cities more sustainable. In the area of water and wastewater services, the New Urban Agenda promotes the conservation and sustainable use of water by rehabilitating water resources within the urban, peri-urban and rural areas, reducing and treating wastewater, minimizing water losses, promoting water reuse and increasing water storage, retention and recharge, taking the water cycle into consideration.

It is important to integrate run-off and wastewater flows into urban diagnostics and early in the spatial planning process to provide an effective basis for equitable, affordable, sustainable and safe wastewater management strategies (including reuse) and effective policies at the city level.

A paradigm change is urgently needed to respond appropriately to growing urban water demands and increasing climate change impacts on freshwater resources. To provide adequate wastewater services in a variety of different urban settings, a better understanding of the differentiated service levels and innovative approaches are

required, giving due attention to the diverse needs of all city residents, regardless of their age, gender or financial situation.

Urban data must be analysed and converted into information that can be visualized by decision makers and urban planners. There is a need to systematically and continuously monitor water and wastewater flows, and to obtain good data sets at spatial and temporal scales, but also to adopt the use of suitable tools and models to convert raw data into relevant information that can be visualized by policymakers and decision makers to inform investments, including those in underserved urban areas.

Development of integrated urban wastewater data-collection methodology and information management systems can be made more meaningful (e.g. the Citywide Inclusive Sanitation public service approach), and utilized to support investments on where attention should be focused. Creating this awareness on how wastewater data supports decision-making and policymaking can foster improvement in integrated urban water management, and contribute to making cities inclusive, safe, resilient and sustainable.

5.

Wastewater governance and integrated policy

Scope of problems

Wastewater management involves a complex combination of technological, policy and socioeconomic expertise from different sectors (e.g. land management, health, environment, economy, agriculture and education), while wastewater stakeholders often remain isolated in their domain silos. Providing affordable and sustainable wastewater management is a massive challenge that not only requires technical skills and financing investments, also clear developed legislations and regulations supported by good governance practice and strong institutions.

Fragmentation of the different wastewater services is a significant bottleneck that hinders planning, budgeting, financing and subsequent investment to significantly increase coverage. Without a specific policy in place, it is hard to plan and budget for wastewater services when faced with other

needs, such as drinking water supply, that often take a primary focus in government plans and budgets.

The legal provisions for regulating wastewater services may not be sufficiently detailed, and wastewater regulation and management in legal instruments can be constrained by gaps due to unclarified roles and responsibilities. While regulatory mechanisms, including the presence of standards, monitoring and performance reporting for oversight regulation can exist, their enforcement and sectioning remains low in many countries. There is often a lack of clear and specific policy to address wastewater separately from the water policy, limited coordination between the national, municipal and local authorities, water and sanitation utilities and private service providers, and absence of a structured wastewater treatment tariff with prices indexed to drinking water bills.



Envato Elements/photos

Opportunities and policy recommendations for action

There is a need to strengthen the institutional framework and enabling environment to improve wastewater governance. Authorities should review their legal frameworks as a starting point for institutional and policy reforms, to develop wastewater management policies and implementation of strategies. Since the wastewater sector cuts across many institutions and levels and thus has a multitude of stakeholders, it is recommended to develop a specific policy for wastewater services to deal with the issue of fragmented institutional and policy arrangements, and to align the countries' needs for both national and international funding opportunities.

A governance programme, or an integrated master plan including both management of liquid and solid waste for the urban and rural centres, can also support an integrated approach for water and wastewater services, aligned to the green economy and climate resilience strategy.

Countries should consider reforming their institutional and regulatory frameworks to steer implementation of SDG 6. Institutionally, a

public lead agency for wastewater management is required to provide direction and regulation of the many actors in the sector. This can help in defining ownership of policies and strategies and improves focus on the wastewater sector.

It is essential that governments take on a central role, especially for peri-urban centres and rural areas to boost technical and financial capacity for local authorities and private operators through investment in infrastructure, enhanced specific budgets and provision of subsidies.

Continuous sharing of best practices across regions among utilities, national, regional and local institutions is essential to bridge the gaps in wastewater services. Benchmarking and lessons learned, and successful stories are required to accelerate service provision in deprived countries and areas.

There is also a need to develop guidelines and policies for wastewater reuse and sludge use across the several potential users, and to improve the treatment regulations of industrial wastewater.

6.

Stimulating investments for financing wastewater management

Scope of problems

The construction and expansion of treatment infrastructures require significant and long-term capital investments, which frequently do not attract the private sector. The general lack of long-term strategies for attracting investments also impedes on the availability of large investment streams from the private sector. The willingness to invest in wastewater services and management is generally also low, while wastewater investment directly improves health, food security, environmental status and communities' livelihoods. Financing wastewater management and monitoring positively impacts WASH, IWRM, water-use efficiency, technology and innovation, data and monitoring, private sector participation, the water-energy-food nexus, ecosystem services, tourism and health.

There is a strong need to invest in infrastructure development to increase coverage of wastewater services and sewerage, which are still very low in many low-income countries, and given the high death rates owing to lack of WASH services. Inadequate wastewater management and services can significantly decrease the gross domestic product, which also has detrimental effects on health, livelihoods, equality, economies and the environment.

Wastewater operating costs are high, and awareness raised on the socioeconomic benefits of wastewater services versus the consequences of poor wastewater treatment within a country is generally inadequate.

Opportunities and policy recommendations for action

Incomes collected from sewage services should be separated in such a way that they can be used to improve the wastewater sector in terms of operation and maintenance, rather than being diverted to the water supply sector. Governments can support the promotion of improved wastewater management through taxes collected from other sectors to create smart subsidies for the wastewater sector, since the cost of operating wastewater systems is very high and cannot be borne by water utilities alone.

Investment in research on products derived from wastewater treatment can help scale up to commercialized by-products and thus create an avenue into the sector for income sources. The promotion of compost sewage sludge presents, for instance, an opportunity for the private sector to also support quality assurance for sustainable resources, and to substitute non-renewable sources such as rock phosphate and chemicals fertilizers that have negative impacts on soil health and cause environmental problems.

There is a need to promote external, but also internal, resource mobilization within countries. Since operating expense is finance that is required to maintain existing infrastructure, such funds should be mobilized within the country so that the ongoing operations can be easily secured to ensure continuity in delivering sewage services, through sustainable models of financing such as blended finance.

Countries need to put in place well-structured tariffs for wastewater services, taking account of their cost recovery mechanisms for better pricing and regulation and improved maintenance of the treatment facilities. Achieving a tariff structure, together with institutional reforms, is key to safeguarding resources that come through provision of wastewater services and to grow the sector.

There is a need to sensitize populations regarding the safe reuse of treated wastewater, and to create awareness of investment opportunities for the private sector. Some start-up capital could be provided by development partners or other institutions to support small entrepreneurs and consider funding a good business plan, especially that involving resource recovery. However, the financial, policy and political implications must be well understood by the private sector to engage investment in wastewater management, and guaranteed by a trusted independent regulator.

Incentives for the private sector can include offering land or guaranteeing the market for power purchase agreements, concessional loans with low interest rates and long payback periods, reduction of costs of energy and water production, and improved legislation and investment laws to formalize the informal sector and encourage the private sector to finance water and wastewater projects.

7.

Towards a common international effort on wastewater monitoring

Scope of problems

The SDG 6.3.1 global progress report published in 2021 revealed that in 2015, only 42 countries (representing less than 20 per cent of the global population) provided information on both generation and treatment of total wastewater flows, of which 32 per cent received at least some treatment. While national data on wastewater treatment may exist, these are not systematically reported to the United Nations Statistics Division/United Nations Environment Programme, Organisation for Economic Co-operation and Development or Eurostat questionnaires, which serve as the primary data source for the SDG indicator on total and industrial wastewater treatment.

Based on the reported data sets, the proportion of industrial wastewater flow treated could only be calculated for 14 countries (representing less than 5 per cent of the global population). Generally, non-domestic wastewater has not been given the attention it deserves, as its volumes are thought to be low and it is often mixed with domestic wastewater or not treated at all.

National data on household wastewater generation and treatment are more widely

available through additional official national data sources, such as reports of national statistics offices or line ministries.

Most countries, irrespective of their income level, fail to consistently monitor or report their annual volumes of treated wastewater. While high-income countries usually have well-monitored wastewater effluent compliance with discharge standards to safeguard aquatic ecosystems receiving systems, there remains a substantial lack of consistent wastewater flow monitoring and/or reporting.

Low-income countries, in which wastewater treatment and monitoring have been a neglected sector, face considerable challenges. These nations not only lack tailored wastewater standards and monitoring systems, but also grapple with limitations in personnel capacity and infrastructure. The limitation of extensive wastewater data, both in terms of geographical coverage and economic contributors to wastewater flows and pollutant loads, impedes the creation of comprehensive estimates at the national, regional and global levels, which is crucial for advancing the SDGs.



Lawrence Hislop/GRID-Arendal

Opportunities and policy recommendations for action

Although the completeness of wastewater statistics remains a challenge, the reporting of SDG indicator 6.3.1 is important for stimulating progress in improving national monitoring programmes that will address data deficiencies and advocating for safe wastewater management. It is therefore important that utilities and governments utilize the content of the SDGs to push for increased wastewater monitoring as a basis for decision-making and internal investments.

The water sector and its policymakers need high-quality wastewater data and real information systems. Benchmarks are needed on best practices, while technical and scientific research and mapping studies of the wastewater quantity, quality and treatment options can provide a broader understanding on how to optimally include wastewater in safe and sustainable water resource management.

Bridging gaps in wastewater monitoring requires national and regional cooperation to share advances in monitoring programmes, to take advantage of recent developments

in information technology, the setting up of laboratories, data analysis and use of relevant tools and models. Building data sharing sites and dashboards can be useful for exchanging information and benchmark on best monitoring methods.

The capacities of water operators and regulators also need to be strengthened. Good practices can be transferred and adopted by utilities facing limitations and technical challenges, such as operation and maintenance, security planning, funding and drawbacks in complying with the wastewater monitoring programmes.

Local wastewater monitoring and national reporting, including in global databases, are essential first steps to accelerating investments in wastewater collection and treatment. Monitoring and reporting wastewater flows require a coordination mechanism and an institutionalized monitoring process by relevant actors such as national statistics offices and authorities in charge of the wastewater sector, environment, health and investment.

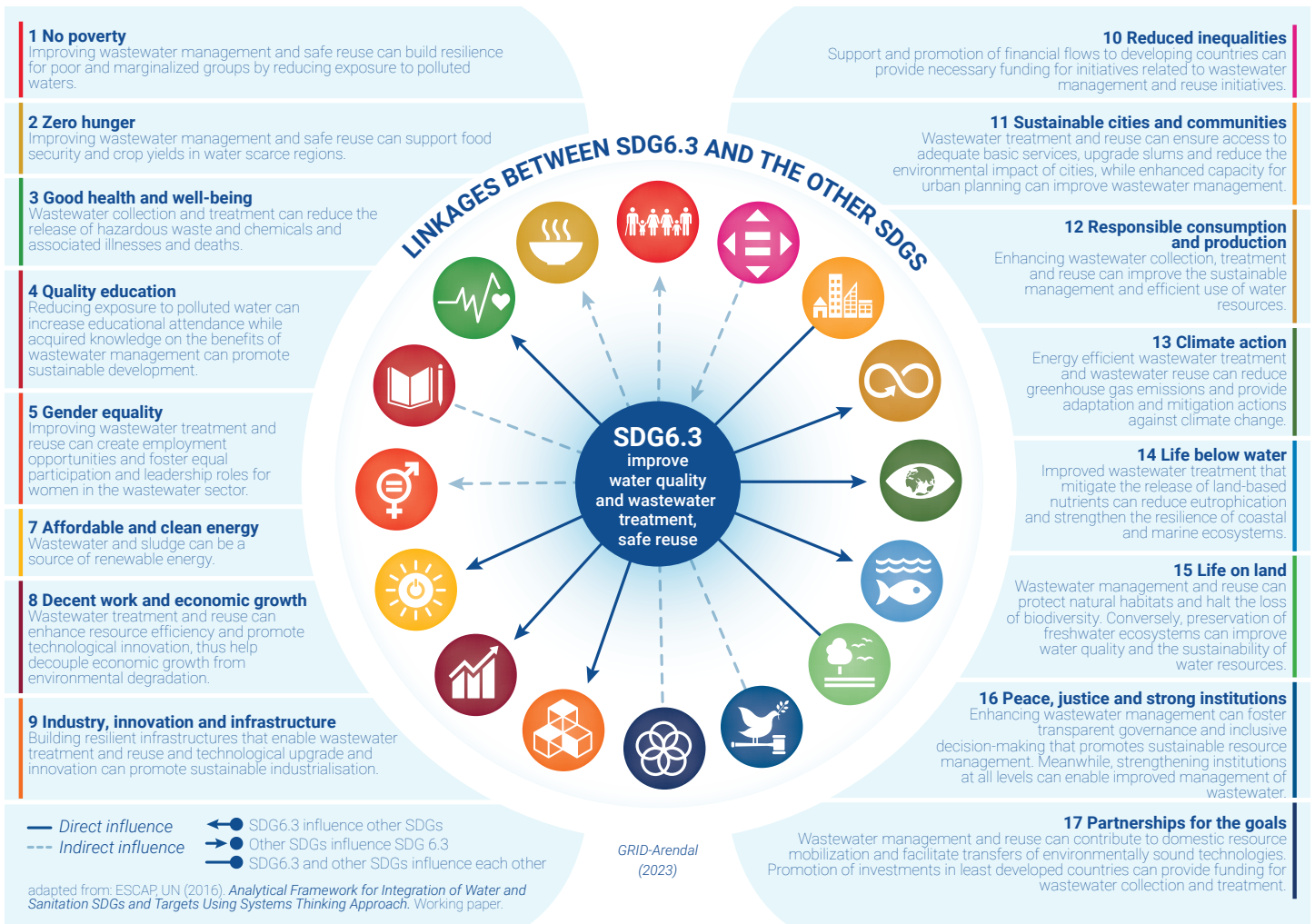
8.

Wastewater interlinkages within the SDGs

Wastewater and the 17 SDGs

Target 6.3, particularly better wastewater management and treatment, has synergies with all other SDGs through the three dimensions of sustainable development (social, economic and environmental). Some examples include:

SDG 11 (“Sustainable cities and communities”): Most available wastewater statistics come from urban wastewater treatment plants. Wastewater utilities should play a major role in water diagnostics approaches such as urban water resources management and Citywide Inclusive Sanitation.



SDG 13 (“Climate action”): There are strong links between wastewater and climate change, since wastewater treatment represents a high energy demand, but also acts as an important source of greenhouse gases, whereas wastewater reuse is a crucial climate change adaptation measure for reducing water stress.

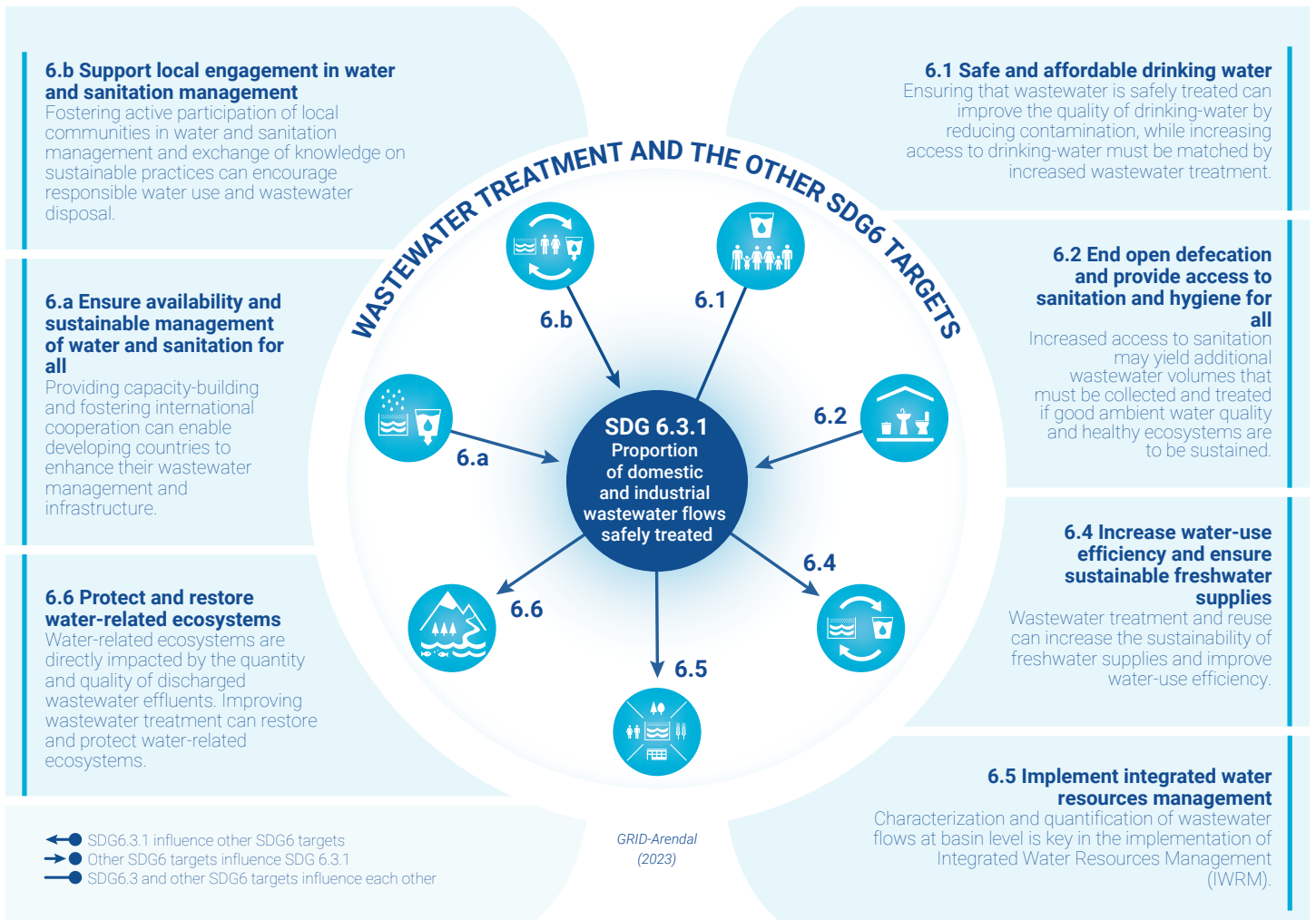
SDG 14 (“Life below water”): Marine water pollution is primarily caused by land-based activities and discharge of inadequately treated municipal and industrial effluents.

Wastewater and the seven targets and 11 indicators in the SDG 6 framework

Improving wastewater management will have direct positive impacts on all other targets and indicators within SDG 6.

Wastewater discharge has direct impacts on the quality of drinking water sources, and improved wastewater treatment is

key to protecting drinking water sources from contamination and achieving universal and equitable access to safe and affordable drinking water for all (target 6.1 and indicator 6.1.1 on the “proportion of population using safely managed drinking water services”).





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Wastewater and treatment facilities are closely connected to target 6.2 “achieve access to adequate and equitable sanitation and hygiene for all and end open defecation”, and to indicator 6.2.1a on the “proportion of population using safely managed sanitation services” which is disaggregated by the type of sanitation facility used in the home (e.g. sewer connections, septic tanks).

Wastewater management is also directly related to indicator 6.3.2 on the “proportion of bodies of water with good ambient water quality”, since contaminated wastewater discharge leads to degradation of the quality of the receiving waters (e.g. lakes and rivers) with increased concentrations of pollutants (e.g. suspended solids, heavy metals, faecal bacteria and nutrients).

Indicator 6.3.1 has strong connections with target 6.4 on “substantially increasing water-use efficiency across all sectors and ensuring sustainable withdrawals and supply of fresh

water to address water scarcity”, especially through the flows of wastewater generated and the impacts of wastewater reuse on the volumes of fresh water available.

The characterization of wastewater flows is also key to implementing Integrated Water Resources Management (IWRM) (target 6.5) at the basin level, which must take account of water sources and uses.

Indicator 6.3.1 is also strongly related to target 6.6 on water-related ecosystems, which are directly impacted by the quantity and quality of domestic and non-domestic effluents discharged into water-receiving systems (dilution of polluted effluents).

Finally, wastewater management, facilities and services are interconnected with target 6.b, which aims “for the participation of local communities in water and sanitation planning and management, which is essential for ensuring that the needs of all people are being met”.

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Annex 1.

Key messages from the webinar series in Africa

Timeline: Three webinars organized in June 2022 were followed by a high-level event during World Water Week in Stockholm in August 2022. This event was hosted by the African Ministers' Council on Water in collaboration with the African Water Association.

Partners: National Water & Sewerage Corporation Uganda, African Water Association, African Development Bank, African Ministers' Council on Water, Eastern and Southern Africa Water and Sanitation Regulators Association

Participation: 22 countries, 20 water and sanitation utilities, 10 country cases presented

Wastewater data monitoring and management:

- There is an existing gap in wastewater monitoring and data management among African utilities, which calls for strong support and capacity-building in skills and knowledge enhancement, as well as for monitoring capacity in terms of infrastructure development.
- In the absence of country-owned data, some estimates of the proportion of wastewater and faecal sludge safely treated can be extracted from the World Health Organization/ United Nations Children's Fund (UNICEF) Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) reports for some countries. These estimates may occasionally be computed based on assumptions not systematically endorsed by the line ministries (e.g. water, environment, public work).

Governance and policies for wastewater management:

- There is a real need to advocate for policy and legislative reforms in the water and wastewater sector and to review national regulations on wastewater, including on non-sewered sanitation, which is prevalent in African countries. It is, for instance, necessary to develop specific standards for wastewater reuse, and to harmonize regional standards for nutrient levels in sewerage effluents.
- In many African countries, sewerage and on-site sanitation are highly fragmented, which makes it difficult to have common policies and frameworks regulating services provision.
- A high number of actors are involved in provision and regulation of wastewater management for both on-site and off-site sanitation, from ministries and regulators at the national level to water and sanitation utilities operators, authorities and the private sector at the local level. Even in countries with sufficient legal instruments, sanitation regulation and management are constrained by gaps due to unclarified roles and responsibilities, and lack of implementation.
- Fragmentation hinders planning, budgeting, financing and subsequent investment to increase sanitation coverage in the region. Cases presented by countries show a lack of a clear and specific policy to address sanitation separately from the water policy, and limited coordination between actors at the national level, municipal and local authorities and private service providers.

Financing and investment in wastewater:

- In Africa, there are still impediments to investment in wastewater, as well as a lack of understanding of the sector's needs.
- The private sector could play a more important role in balancing capital investments and operation and maintenance investments.
- Some governments rely on external sources of funding for capital investments, not only for wastewater treatment, but also for operation and maintenance expenses. Strategies to obtain operation and maintenance funds would need to be internally sourced from within the country to secure funds for sustainable operation of the (existing) facilities.
- Non-sovereign water operations are needed to create bankable wastewater projects and strengthen the capabilities of utilities.
- The lack of strategies for attracting investments impedes on the availability of large investment streams from the private sector. In many countries, government orientations in the field of sanitation development are very scanty and lack clarity in national development plans.
- Funds to operate sanitation systems can be obtained from revenue collected from the sale of fertilizers through recovered nutrients from treatment plants. There are also technologies to allow for on-site generation of energy such as biogas which can help to reduce operation costs.

Annex 2.

Key messages from the webinar series in the Arab States

Timeline: Three webinars organized in June and July 2022 were followed by a high-level webinar with national authorities and government officials in August 2022.

Partners: Arab Countries Water Utilities Association, Arab Ministerial Water Council, Islamic Development Bank, Arab Open University

Participation: 42 countries, 46 water and sanitation utilities, 15 country cases presented

Wastewater data monitoring and management:

- A regional mechanism is needed for monitoring and reporting of wastewater flows.
- Collecting wastewater data should be linked to governance and policymaking advice procedures to improve water management.
- There is a need to move towards smart water and wastewater management.

Governance and policies for wastewater management:

- There is a need to revise and enhance all legislations and standards and regulations, to improve the legislation and investment laws and bylaws, and to develop financial incentives to encourage the private sector to finance water and wastewater projects.
- The treated wastewater should be part of the Arab countries' national water master plans, water budgets and investment plans.
- Planning for wastewater reuse should be considered early in the urban planning process. There is also a need to enhance social acceptance of the agricultural products irrigated by treated wastewater to help achieve food security in the Arab Region.
- There is a need to develop guidelines for wastewater reuse and sludge use across the several potential users, and to improve the treatment regulations of industrial wastewater.
- There is a need to enhance the wastewater governance, and particularly to increase coordination between several related public institutions.
- There is a need to establish a Technical Working Group focused on wastewater management to host the best practices and disseminate knowledge in the Arab Region.

Financing and investment in wastewater:

- The establishment of an independent regulator for the water sector is a major milestone to monitor the service provider and private sector, in an approach based on transparency and fairness, and to satisfy all stakeholders in case of dispute and to keep the interest of customers.
- It is important to properly demonstrate climate rationales in the development projects for accelerating project financing.
- Wastewater treatment and reuse knowledge is considered a participatory issue, and decision makers should give high priority in financing these projects.
- There is a strong demand to develop and implement capacity development programmes in water and wastewater treatment and reuse, and in climate change adaptation/mitigation.

- To effectively manage their water resources, countries are encouraged to adopt an integrated approach in water resources management, linked to investment needs.
- Improving financial efficiency for utilities, with the aim of financial sustainability.
- Developing the following national strategies: a national master water plan to bridge the gap between water demand and available water resources, an investment plan for the new water and wastewater projects, and a fundraising strategy.
- Public-private partnership contracts should be structured in a way that transfers a certain amount of risk to the private sector, so that the reward that paid to them is commensurate with the risk they are taking.
- Co-funding instruments are considered one of the options in securing funds through: participation in national funds such as the Social Security Fund and National Pension Fund in financing the investment plan (public-owned companies), offering shares of water public utilities in the financial stock market to enable citizens and the private sector to become shareholders.
- The national companies shall develop an actuarial financial strategy and financial modalities to assure that the shareholders' company concept is affordable and bankable.

Annex 3.

Key messages from the webinar series in Asia

Timeline: Three webinars were organized in South-East Asia and three webinars were organized in South Asia in November 2022 and March 2023.

Partners: Asian Institute of Technology Global Water & Sanitation Center of Thailand

Participation: 12 countries, 12 national water and sanitation utilities, eight country cases presented

Wastewater data monitoring and management:

- Water utilities do not always offer wastewater treatment services. This is often due to institutional arrangements, where water and wastewater service providers are often different entities. In some cases, water utilities only provide water, while local government units or wastewater utilities are responsible for wastewater treatment.
- Institutional arrangements for data management vary widely, from centralized systems where government agencies hold primary responsibility to decentralized approaches involving collaboration among multiple stakeholders, including government bodies, research institutions and private enterprises.
- Comprehensive data management systems for wastewater can provide real-time information on the status of wastewater infrastructure, allowing for effective analysis and management of wastewater, such as providing new access and measuring the amount of treated wastewater. These systems include treatment plants, monitoring and sampling, quality standards, GIS mapping and centralized data management systems.

Governance and policies for wastewater management:

- Establish a 'One Data Policy' by assigning one institution in charge of One Data. Countries assign their national statistics offices to collect and publish wastewater data for planning and monitoring purposes.
- The introduction of the SDG 6.3.1 monitoring framework to some ongoing development initiatives, such as Citywide Inclusive Sanitation and existing monitoring systems for industrial wastewater, will align different interests and goals in monitoring the quantity and quality of wastewater.
- Cohesion of agencies and policies for nationally determined contributions is needed through active involvement of development agencies and universities, connecting local efforts in establishing a system to monitor and evaluate safely managed/treated wastewater.
- Increase involvement of relevant government institutions such as the Ministry of Industry and Ministry of Environment to cover non-domestic wastewater. Currently, only institutions that relate to domestic wastewater are involved and water utilities in the Asia context mostly supply for domestic purposes.

Financing and investment in wastewater:

- While authorities previously focused on improving access to sanitation and treating domestic wastewater, they did not necessarily focus on monitoring the volume of (safely treated) wastewater discharged – especially from industrial and agricultural sources – despite their impact on ambient water quality, health, biodiversity and economy.
- Utilities need to adopt new approaches to data management to better understand their businesses and make more informed decisions on how to expand and improve their services.
- The availability of accurate and reliable data is crucial to allow investors and financial institutions to assess the viability and potential returns of investing in wastewater management initiatives. It provides them with valuable information to evaluate the risks and opportunities associated with such investments.

Annex 4.

Key messages from the webinar series in the Caribbean

Timeline: Four webinars organized from March to June 2021 were followed by participation at the High Level Forum for Caribbean Ministers with responsibility for water in October 2021.

Partners: Caribbean Water and Wastewater Association, Caribbean Water & Sewerage Association, Caribbean Development Bank, Inter-American Development Bank

Participation: 13 countries, 13 national water and sanitation utilities, four country cases presented

Wastewater data monitoring and management:

- Some sector challenges common to many countries in the region are the low operating recovery ratio from the water bills, the unwillingness of customers to connect to sewer systems, abandoned non-utility wastewater facilities and lack of compliance with existing legislation and regulations.
- Caribbean islands are economically, environmentally and socially vulnerable to disasters and climate change. Particular attention should be paid to the design of wastewater solutions that are resilient to natural hazards and climate impacts, ensuring reliable and climate-proofed water and sanitation services.
- As some Caribbean islands are changing their approach to wastewater management (i.e. moving from septic tanks to package and treatment plants), it is important to consider different options of innovative wastewater treatment solutions, conventional and non-conventional as well as nature-based solutions and green infrastructures that can be adapted to the regional context.
- There are strong limitations to treatment technologies in small towns and peri-urban areas, including the lack of technical capacity, limited funds, limited availability of consumables and spare parts, and limited and costly energy supply. Technical solutions should be simple and easy to operate and maintain, and should minimize investment and operational costs.

Governance and policies for wastewater management:

- Many Caribbean islands lack appropriate governance and legal structures, required legislation and national standards which, if they exist, may not be followed properly.
- There is a real need to advocate for policy and legislative reforms in the water and wastewater sector and to review national regulations on wastewater. Standards are necessary and warranted from an environmental point of view and are a prerequisite for proper monitoring.
- It is also necessary to develop specific standards for wastewater and sludge reuse, and to harmonize regional standards for nutrient levels in sewerage effluents.
- The region needs governance arrangements that promote wastewater as a resource. There are sociocultural barriers that need to be addressed regarding mainstreamed treated wastewater reuse.
- The policy legislative and institutional governance arrangements should reflect partnerships between multiple sectors, bringing the public and private sector together.

Financing and investment in wastewater

- Wastewater is unattractive to investors as compared to water supply.
- Utilities of the Caribbean are largely government-owned, making the issue of investment also one of affordability by national governments.
- Water utilities are often disconnected from the decision-making process taking place at the national level by ministries of finance in charge of negotiating investments and loans from international development institutions.
- There is a range of innovative financing mechanisms that create liquidity for increased investment in the longer term, such as: creation/reform of revolving funds, introduction of tariffs that fully finance the system and reforming tariffs to include reuse options in an economically viable way, creation of the business case for safe reuse by calculating commercial and socioeconomic benefits, operation and maintenance pricing that incentivizes efficiency of wastewater provision and water usage, promotion of private investment through fostering of public-private partnerships according to standards to ensure benefits to the population, etc.

Annex 5.

Key messages from the webinar series in Latin America

Timeline: One webinar was organized in July 2020 and three were organized in May and June 2021.

Partners: Inter-American Development Bank, Regional Water Operators' Platform Latin America and Caribbean Region

Participation: 12 countries, 50 water and sanitation utilities, 10 country cases presented

Wastewater data monitoring and management:

- Many national statistics offices do not sufficiently disaggregate the data that could be used to show where sanitation gaps and inequalities exist. Utility data should be collected and analysed more effectively to improve decision-making, operation and maintenance, reduce the possibilities of environmental contamination, and ultimately attract more finance and support to an area of the water cycle that has generally been very neglected.
- When information is made available, it is not always methodologically comparable between countries since definitions are often different and data are not standardized.
- In Latin American, about a quarter of water is used by industries and commerce. However, it is very difficult to obtain wastewater data from industries that use their own resources such as surface water (lakes, rivers) and groundwater, which are not included in public statistics.
- Water and sanitation utilities generally lack human capacity and staff trained to collect and analyse wastewater data. Financial resources should be allocated to hire and train personnel to work on data management and monitoring, and to carry out some statistical analysis of the data.

Governance and policies for wastewater management:

- Latin America is one of the most urbanized regions, with many informal and poor settlements.
- There is a need for governance arrangements that promote wastewater as a resource and that encourage the use of nature-based solutions and wastewater/sludge safe treatment and reuse.
- In parallel, there is a need to commit some consumers to reuse water through regulations or raising the cost of first-use water, to limit the possibilities of water extraction by forcing the use of reused water, to subsidize the development of reuse infrastructure, to avoid the transfer of reuse costs to users at a regulated rate, and to support and reinforce through other instruments the control of the discharge of wastewater to sewerage networks, which affects reuse options.
- In small towns, there is limited technical capacity, so that when it comes to selecting an adapted technical option, people should opt for easy-to-operate technologies.
- It is important to use techniques that save energy. It is, however, not always possible to use nature-based solutions such as lagoons, which can sometimes depend on strict regulations that are copied from richer/more developed countries and not adapted to the local context.

Financing and investment in wastewater:

- Very few countries generate the right information on the state of sanitation to measure progress towards achievement of SDG 6. Efforts should be made to develop national official data sources to improve the information for decision makers, so that adequate policies are developed and public institutions can request the suitable funding.
- The circular economy requires coordination of different actors and sectors, and strengthening of regional and local capacities for development of projects. Technological innovation, management models and strategies must involve the private sector's access to innovative financing instruments to advance more quickly, not only in the circular economy, but also in the sanitation agenda.
- Financial planning goes beyond economic and operational calculations, and should include the expected efficiency of the treatment, which sometimes depends on the standards, the total investment and operational costs, and the geographic area of the project.
- While some resources are available, there are neither real estimates of the needs for investment nor concrete feasible and projects that are ready to be funded able to be discussed with higher authorities. In some cases, a master plan or a project takes two or three years to be designed, which causes significant delays and issues (e.g. with the Ministry of Economy and Finance).

This policy brief highlights the crucial importance of improving wastewater management and monitoring for a range of development objectives. It builds on the commitment made at the UN 2023 Water Conference and on the outcomes of a series of five regional webinars convened by the United Nations Human Settlements Programme (UN-Habitat) and regional co-organizers between 2020 and 2023 in Africa, the Arab Region, Asia, the Caribbean and Latin America, which explored regional practices on wastewater monitoring and discussed how to strengthen policy development and decision-making for investment in wastewater management. These webinars involved more than 100 countries and 141 water and sanitation utilities, regional water associations, regulators, line ministries, development partners, academic institutions and others from public and private sectors. They were followed by data-collection exercises conducted by regional co-organizers to support national institutions in their efforts to report accurately on Sustainable Development Goal (SDG) indicator 6.3.1 and enhance water and wastewater monitoring worldwide.



UN-HABITAT