sustainable sanitation alliance

Shaping the water sector to be more climate resilient

A plea for greater and wider collaboration

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Acronyms list

ATES	Aquifer thermal energy storage
DGAA	Dirección General de Asuntos Ambientales
GHG	Greenhouse gas
GWOPA	Global Water Operators Partnerships Alliance
HSE	Hamburger Stadtentwässerung
HWW	Hamburger Wasserwerke
IWRM	Integrated Water Resources Management
MVCS	Peruvian Ministry of Housing, Construction and Sanitation
NDC	Nationally determined contributions
NGO	Non-governmental organization
NWSC	National Water and Sewerage Corporation
PMACC	Planes de Mitigación y Adaptación al Cambio Climático
REVAMP	Resource Value Mapping
SDG	Sustainable Development Goal
SEI	Stockholm Environment Institute
SSI	Sustainable Services Initiative
VcA	Viva con Agua
WASH	Water, sanitation and hygiene
WEAP	Water Evaluation and Planning
WOP	Water Operator Partnership
WRM	Water Resources Management

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1. Manufacturing of Spouts water filter © Papa Shabani for Viva con Agua
2. Hamburg's Wastewater Treatment Plant Köhlbrandhöft © Hamburg Wasser
3. Participatory capacity building activity in the framework of the WaCCliM project © GIZ
4. Participatory problem formulation in Tupiza watershed © SEI

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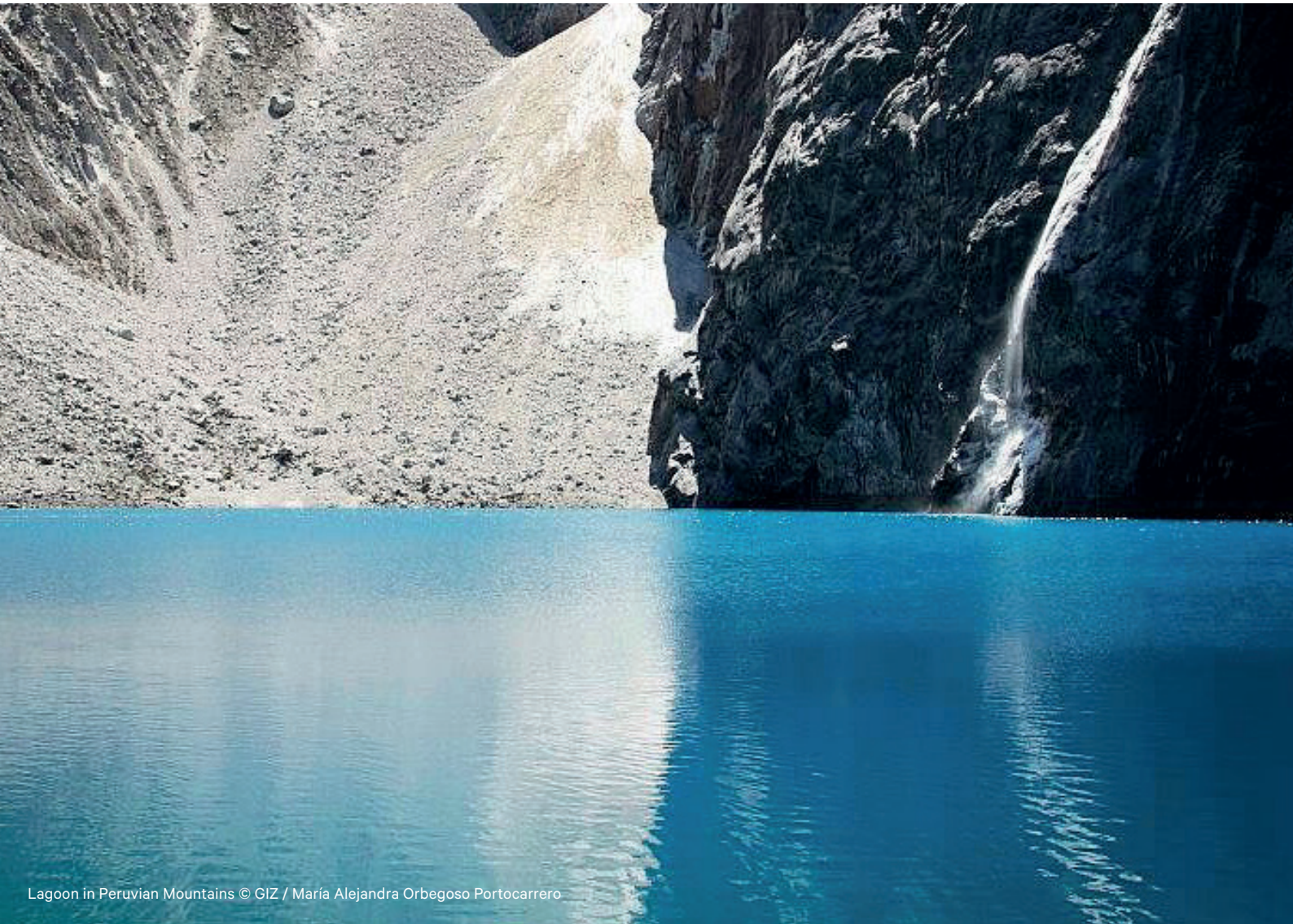
1. Executive summary

Improved water management can play an important role not only in climate change adaptation but also in climate change mitigation. Many of the concepts, technologies and resources required to support improved management already exist, but are scattered across different organizations in multiple countries. This potential can be tapped into by increased collaboration. Referring to existing guidelines, handbooks and six case studies (all quite different in terms of scope and geography), this report describes specific approaches and regulatory framework conditions facilitating cross-sectoral collaboration. However, while an expansion of cross-sectoral approaches is needed, it must be done proportionately, with due consideration of opportunities and risks, to generate added value for water and sanitation services, as well as for climate change mitigation and adaptation. There is a clear need to adjust organizational structures and decision-making processes at the operational level to ensure that processes do not become too complex and therefore inefficient.



Lagoon in Peruvian Mountains © GIZ / María Alejandra Orbegoso Portocarrero

2. Introduction

Water supply and wastewater treatment systems, while a significant source of greenhouse gas (GHG) emissions themselves, are increasingly experiencing the impacts of climate change. According to the United Nations World Water Development Report 2020 (Water and Climate Change),1 there is greater recognition and understanding of the important role that improved water management can play not only in climate change adaptation but also in climate change mitigation.

The water and sanitation sector is estimated to contribute up to 5% of global GHG emissions[2] through its energy consumption, mostly of fossil fuels, and direct emissions of methane and nitrous oxide. Consequently, the sector must reduce its own emissions' footprint and become more resilient to climate change impacts. This includes adapting to changing water quantity, quality and availability. At the same time, operators must improve or maintain service levels and cost effectiveness.

These appear to be overwhelming challenges. However, many of the concepts, technologies and resources needed to overcome them already exist, but are scattered across different organizations in multiple countries. It is widely acknowledged that the chances of achieving Sustainable Development Goals (SDGs) 6 (Clean Water and Sanitation) and 13 (Climate Action) by 2030 would be significantly improved by increased collaboration, with fewer trade-offs and greater synergy.

According to a report by the Partnering Initiative,[3] collaboration, which focused on single issues at a global level in the Millennium Development Goal era, must move towards integrated local solutions in the SDG era. Focusing more on local context will initiate a shift away from the abstract towards the concrete and specific, and from single-issue approaches towards a more holistic multiple-issue approach.

However, while collaboration often works well in areas where stakeholders are used to cooperating or where an official normative framework regulates cooperation, it works less well outside of established collaboration patterns or without normative frameworks.

Bearing in mind SDG 17 (Partnership for the Goals), which promotes cooperation, we have been examining the extent to which active stakeholders in the water and climate sectors are already collaborating, and what can be learnt from these collaborations. We have selected six exemplary case studies that offer examples of local, multiple-issue collaborative approaches and highlight some specific reasons why collaboration works and how the added value of collaboration is seen.

Three of the case studies relate mainly to sectoral and cross-sectoral cooperation at governmental, institutional and personal levels.

- A WaCCliM case study describes how the Peruvian government, with support from German and Swiss donors, stipulates climate change adaptation and mitigation strategies as part of the legal water and sanitation framework and how different stakeholders cooperate to provide more sustainable and climate resilient services.

- The use of a Water Operator Partnership (WOP) to guide collaboration between VEI from the Netherlands and the public utility National Water and Sewerage Corporation (NWSC) from Uganda is described in a second case study. Through the WOP, VEI supports NWSC's efforts to continuously improve its operational performance and investment planning.

- A case study from the German water utility Hamburg Wasser shows how it contributes to the city's climate plan by following a cross-sectoral approach to public service provision, which considers the integration of water services, energy supply, mobility and climate adaptation in cross-sectoral spatial planning.

1 https://www.unwater.org/publications/world-water-development-report-2020/
2 https://wacclim.org/wp-content/uploads/2020/02/WaCCliM-Bochure_2020_EN.pdf
3 "Collaboration for the SDGs: Exploring the support system for effective partnering". https://thepartneringinitiative.org/publications/research-papers/collaboration-for-the-sdgs-support-system/

Wastewater treatment plant, Tupiza watershed, Bolivia © SEI

The fourth case study, from Bolivia, describes collaboration between multiple stakeholders at the watershed level, showing how SDG 6 targets (water supply, sanitation, water efficiency, wastewater management, protecting aquatic ecosystems) and the underlying economic sectors can be integrated into a holistic Integrated Water Resources Management process.

The two other case studies relate to the important activities of non-governmental organizations (NGOs).

- Viva con Agua uses the universal languages of sport, music and art to sensitize and mobilize young people for water, sanitation and hygiene (WASH) and climate issues. It also uses innovative partnerships with climate-friendly companies to encourage sustainable social entrepreneurship.

- The Sustainable Services Initiative recognizes that functioning public services require more than just technologies. It engages local stakeholders in a systems-strengthening approach to evaluate nine key 'building blocks' of WASH systems, with the aim of ensuring that public services function sustainably in the long term.

We have also analysed how collaboration could be improved, using both our own experience and referring to existing guidelines and some theoretical background. This is briefly described in Chapter 3.

3. What can we learn from existing guidelines?

3.1 SDG Partnership (Collaboration Report and Guidebook)

Key messages

- **Top-down, short-term, single-sector approaches generally cannot deliver long-lasting impact – the system is too complex.**
- **Partnering is the "new normal".**
- **Limited resources, whether financial, technological, natural or human, make partnerships essential to maximize the collective impact of available resources.**

According to the "Collaboration Report",[4] collaborative action at scale does not necessarily imply significantly larger individual partnerships, covering more geographies, with more funding. The opposite may be closer to the truth. Achieving impact at scale may actually require many smaller collaborative initiatives, utilizing local resources more effectively to achieve locally defined priorities, and working in informal or formal cooperative ways with related initiatives. The report lists many options for integration between similar collaborative efforts, ranging from informal dialogue through to formal mergers. It also describes five levels of engagement in partnering for the SDGs, ranging from individual competencies through to systems within which individuals, organizations, partnerships and platforms cooperate.

Nevertheless, most of us are used to operating within environments that encourage competition and separation, rather than collaboration and cooperation. In addition, we become caught up in our daily routines, leaving little opportunity for real behaviour change. Therefore, the authors of the Collaboration Report developed "The SDG Partnership Guidebook: A Practical Guide to Building High Impact Multi-stakeholder Partnerships for the Sustainable Development Goals".[5] This covers a wide range of topics, including defining and categorizing partnerships; understanding different stakeholders and value creation; the process of partnering and partnership formation; and the building blocks of effective partnerships. A variety of tools are also provided, such as stakeholder mapping, a partnering agreement template, a value assessment framework and troubleshooting methods.

The guidebook is not restricted to the classic stakeholders (governments and governmental organizations, civil society and NGOs, academia and think tanks). Instead, business is also considered as a key development actor and partner. This includes international commercial investment and the de-risking of investment through blended finance tools. However, regulated, contract-based public-private partnerships are considered differently from other forms of development partnership and are more akin to a procurement-based service-delivery relationship than a genuine partnership.

3.2 Sustainable Sanitation Alliance (SuSanA): "Opportunities for Sustainable Sanitation in Climate Action"

Key messages

- **There are strong interdependencies between climate and sanitation and also between related sectors such as water, sanitation, energy, agriculture, disaster risk reduction, climate adaptation and climate mitigation.**
- **An enabling environment is needed for integrated climate and sanitation strategies.**
- **More climate-change-resilient and low-carbon sanitation solutions are available and should be utlized.**
- **More collaboration is needed between related sectors with the aim of developing synergies through cross-sectoral approaches that are sustainable, efficient, effective and resilient.**

In 2019, members of the SuSanA working group on renewable energies and climate change published the background paper "Opportunities for Sustainable Sanitation in Climate Action".[6] The paper describes the manifold interactions between sanitation and climate change and illustrates cross-sectoral approaches. It provides an impression of the high demand for more cross-sectoral collaboration.

The following points illustrate the variety of interdependencies between sanitation and climate change.

- Changing climate conditions require adaptation of sanitation practices, improved water efficiency in sanitation systems and increased reuse of wastewater and related substrates. Thus, multiple other sectors, such as the agricultural and energy sectors, must be considered in a cross-sectoral perspective.
- Climate risks can negatively impact water availability, water quality and the sanitation infrastructure itself through changing precipitation patterns, heat waves, droughts, floods, etc. They also impact human health through an increased risk of waterborne illnesses and greater abundance of disease vectors, as well as through their detrimental effect on food production.
- Sanitation systems need to contribute more to GHG mitigation; for example, through renewable energy production, increased energy and water efficiency, the substitution of synthetic fertilizers and carbon sequestration.

Successfully integrating sanitation development and climate action depends on having the right conditions in place. The enabling environment needs to facilitate a strong, collaborative, cross-

4 https://thepartneringinitiative.org/publications/research-papers/collaboration-for-the-sdgs-support-system/
5 https://thepartneringinitiative.org/publications/toolbook-series/the-sdg-partnerships-guidebook/
6 https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/3678

sectoral momentum, considering elements such as regulatory frameworks, institutional setups, human capacities, finances and infrastructure designs, as well as sociocultural and equity aspects.

The paper also examines the relevance of sustainable sanitation in the Paris Agreement on climate change, the Sendai Framework for Disaster Risk Reduction 2015–2030 and the relevant SDGs of the 2030 Agenda. It notes that:

- Nationally determined contributions (NDCs) are the main instruments used by countries to outline climate actions and commitments with the aim of fulfilling the Paris Agreement. However, sanitation is largely ignored in NDCs: only 2% of the SDG 6-related NDCs deal with sanitation access, while wastewater management and water reuse are mentioned in 3%. This suggests that climate-relevant adaptation of sanitation solutions offers considerable untapped potential for reducing GHG emissions from the water and wastewater sector.

- Target 4 of the Sendai Framework for Disaster Risk Reduction clearly applies to sanitation infrastructure, with the aim of ensuring that infrastructure remains safe, effective and operational during and after disasters to provide essential life-saving services and reduce the risk of disease outbreaks. It clearly shows the links between disaster risk reduction and sanitation.

- SDG 6 (Clean Water and Sanitation) of the 2030 Agenda draws attention to especially vulnerable populations. Its call for universal access to adequate water supplies and sanitation cannot be met without climate-resilient sanitation systems. Wastewater treatment and the safe reuse of water and resources found in wastewater and excreta can help to reduce climate-related threats such as water shortages and disease outbreaks. It can also contribute to providing clean energy, low-emissions plant fertilizers and soil-conditioning substrates.

Finally, the paper states that the application of climate assessment and planning tools is an important step in making sanitation projects and programmes more sustainable. Such tools aim to integrate climate framework conditions and related uncertainties. Many consider climate as well as environmental risk mitigation and opportunities that create added value, such as synergies arising from cross-sector approaches.

Participatory capacity building activity in the framework of the WaCCliM project ©GIZ

Key messages

- **The WaCCliM roadmap is the first guide of its kind to provide a practical approach towards a low-carbon water and sanitation sector.**
- **The roadmap's methodology enables knowledge sharing between utilities on their way to carbon neutrality.**
- **Utilities, governments and donors should join this initiative for a better urban water and sanitation future.**

3.3 WaCCliM: "The Roadmap to a Low-Carbon Urban Water Utility"

A good example of the climate assessment and planning tools mentioned above has been developed within the WaCCliM project (Box 1). "The Roadmap to a Low-Carbon Urban Water Utility"[7] presents water and sanitation professionals with an integrated approach to addressing their most pressing challenges in operating a sustainable urban water system. Furthermore, it supports local and global efforts to reduce GHG emissions through economically viable measures and thus contributes to the achievement of NDCs and the Paris Agreement.

The roadmap is intended for managers in charge of improving a utility's performance and sustainability as well as stakeholders who support the utility's action plans. It builds on experiences gained during the WaCCliM project's work in Jordan, Mexico, Peru and Thailand. The Peruvian context is briefly described in the first case study.

Water and Wastewater Companies for Climate Mitigation

WaCCliM

BOX 1: THE WACCLIM PROJECT

WaCCliM (Water and Wastewater Companies for Climate Mitigation) is a joint initiative between the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH and the International Water Association. As part of the International Climate Initiative, the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety supports WaCCliM with the agreement of the German Bundestag

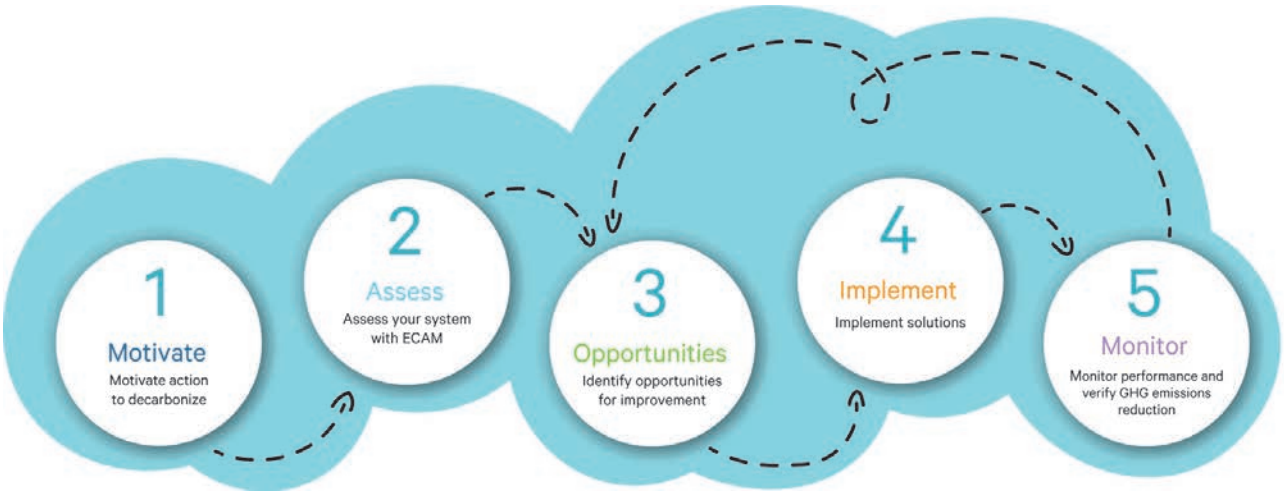
The roadmap has three parts.

- Part 1 supports and motivates utility managers and other urban water actors in integrating decarbonization, resilience and environmental sustainability into future planning. It also provides ideas on how to convince additional stakeholders to become change agents for a low-carbon urban water and sanitation sector.
- Part 2 guides water managers through an iterative five-step approach for implementing change (Box 2).
- Part 3 offers a perspective on the urban water utility of the future. Important actions for achieving the desired change towards low-carbon, holistic and sustainable urban water utilities include continued improvement of operations, strategic short- and long-term planning and increasing efforts to achieve local, regional and global partnerships.

The WaCCliM roadmap is the first guide of its kind to demonstrate a clear and practical approach towards a low-carbon, holistic and sustainable water and sanitation sector. Becoming a part of this initiative and collaborating with other progressive actors is essential for the global movement towards a better urban water and sanitation future for utilities, their communities and the world.

7 https://wacclim.org/the-roadmap-to-a-low-carbon-urban-water-utility/

BOX 2: FIVE STEPS TO IMPLEMENTING THE WACCLIM ROADMAP



The five-step approach that utility managers and water and sanitation experts should follow to implement the roadmap is:

- Step 1: Motivate action – set objectives and identify drivers that link efforts towards a low-carbon urban water utility.
- Step 2: Assess your system – assess, visualize and present emissions and inefficiencies in water, wastewater and drainage systems, using tools such as the Energy Performance and Carbon Emissions Assessment and Monitoring (ECAM) tool.
- Step 3: Identify opportunities – identify where action is most promising to reduce GHG emissions while optimizing processes, saving money and improving service delivery. During this step, it is essential to exchange knowledge with and learn from other utilities that have conducted similar studies to identify opportunities.
- Step 4: Implement measures – enable implementation, for example, through strengthening capacities, policies, financing strategies and stakeholder engagement. Document the implementation process for exchange with other utilities and future learning.
- Step 5: Monitor impact – visualize emissions, compare them with a business-as-usual scenario and monitor the impact of the implemented measures with the help of the ECAM tool. Demonstrating a capacity to monitor real reductions in emissions is key to accessing climate financing.

Manufacturing of Spouts water filter ©Papa Shabani for Viva con Agua

4. What can we learn from case studies?

4.1 Including climate plans in the national sanitation framework: the Peruvian experience

Key messages

- **The assistance provided to the Peruvian Ministry of Housing, Construction and Sanitation (MVCS) to support the drawing up of climate change mitigation and adaptation plans by the water and sanitation sector is a good example of institutional collaboration, as it included two programmes financed by three donor institutions.**
- **Collaboration efforts by the MVCS, including discussions with the Environmental Ministry and the joint provision of technical assistance to utilities, were essential in achieving the inclusion of a requirement for climate change adaptation and mitigation plans in the national legal framework.**

The Peruvian government considers access to and quality of drinking water and sanitation services to be among its top priorities. The important role of the relevant ministries, together with water and sanitation utilities, in supporting public health, poverty reduction and economic development is widely recognized. The response to the COVID-19 pandemic has increased the importance of safe access to water and sanitation for all.

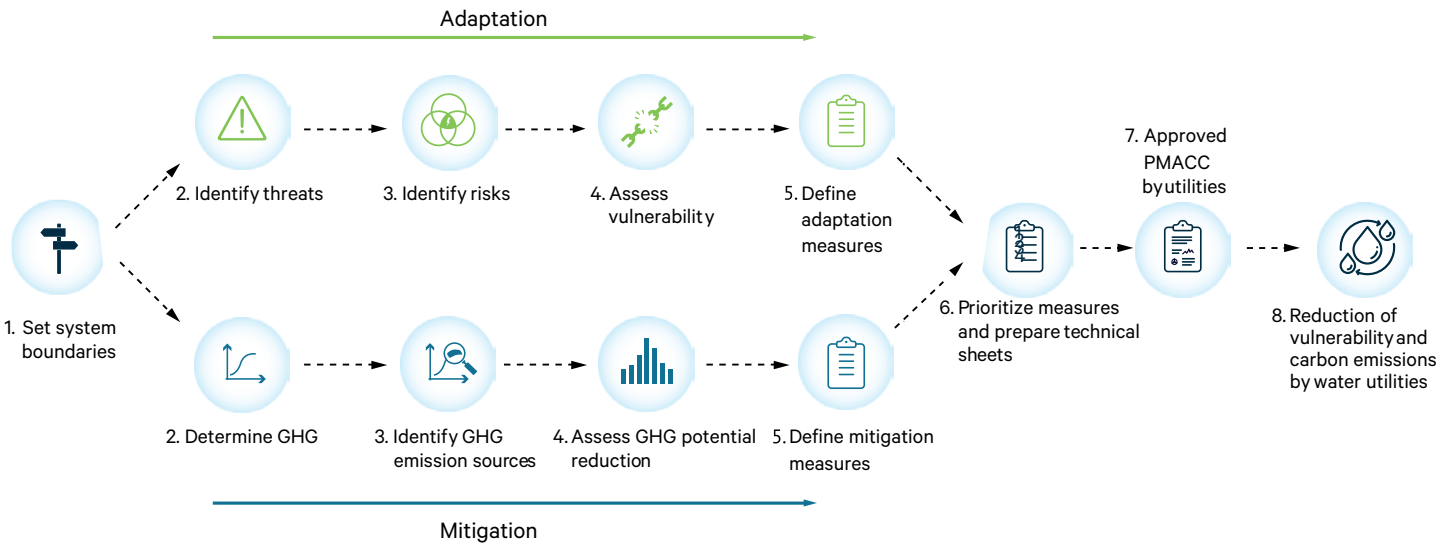
The water sector in Peru is affected by rapid urbanization and water stress, as well as climate change and extreme weather events that exacerbate existing problems. Droughts, floods, abnormal precipitation and mudslides greatly impact service delivery, affecting water availability and quality, while the operation of water supply and wastewater systems generates high levels of GHG emissions.

Therefore, considering climate change adaptation and mitigation strategies when planning water and sanitation services contributes to service sustainability and thus directly benefits millions of Peruvians. Moreover, it offers a great opportunity to demonstrate how the water sector can contribute to meeting the targets of the 2030 Agenda and the Paris Agreement.

Since 2014, the WaCCliM project and the Programme for the Modernisation and Strengthening of Drinking Water and Wastewater Management (PROAGUA II) have assisted the Peruvian Ministry of Housing, Construction and Sanitation (MVCS) in developing and implementing a methodological process to help utilities draw up climate change mitigation and adaptation plans. These "Planes de Mitigación y Adaptación al Cambio Climático" (PMACCs) are tailored to the utilities' different contexts, sizes and locations (Figure 1).

Using a web-based tool for developing PMACCs, utilities have been helped to assess their carbon emissions and wider climate risks as well as identify effective mitigation and adaptation measures in the short and long term; these represent the water sector's contribution to Peru's NDC. This simultaneous analysis of mitigation and adaptation allows actions to be prioritized, considering co-benefits and avoiding counter effects. This approach has now been adopted into the legal framework that governs the water and sanitation sector in Peru (Box 3).

Figure 1: Steps in drawing up and implementing a mitigation and adaptation plan for a utility



Drawing up PMACCs has enabled water utilities in Peru to start implementing mitigation measures. For example, SEDACUSCO, WaCCliM's pilot utility in the country, has improved the sludge management process at its wastewater treatment plant and avoided emissions of almost 7500 tons of CO_2 per year – equivalent to 5300 passengers flying from Lima to Frankfurt and back – while bringing a serious odour problem under control. Currently, the utility is installing a cogeneration system that will generate electricity for internal use, thereby saving EUR 260,000 in annual electricity costs and avoiding a further 544 tons of CO_2 emissions each year.

BOX 3: A NEW LEGAL REQUIREMENT FOR PMACCS

In 2017, following the completion of 23 PMACCs, the MVCS included a requirement for utilities to develop PMACCs in the 'Framework Law for Management and Provision of Sanitation Services'. This was an important milestone for tackling climate change in the water sector.

Within the MVCS, the Dirección General de Asuntos Ambientales (DGAA) is responsible for environmental management of the water sector. DGAA's experts have taken a pioneering approach to integrating climate change management into the sector's strategic instruments. In addition, in collaboration with the Technical Organization for Sanitation Services Administration, DGAA provides technical assistance to water and sanitation utilities drawing up their PMACCs.

The PMACC initiative is also a good example of efforts to harmonize development aid from different donors and of institutional collaboration. It was jointly developed and implemented by WaCCliM, which is financed by the German Federal Ministry for Environment, Nature Conservation and Nuclear Safety, and PROAGUA II, which is financed by the German Federal Ministry for Economic Cooperation and Development and the Swiss State Secretariat for Economic Affairs.

In 2021, PROAGUA II and WaCCliM will again join forces to support MVCS in offering all Peruvian water and sanitation utilities a capacity development tool kit that will help them develop, implement and monitor NDC measures in compliance with the new legal framework.

Wastewater treatment plant of Cusco, Peru, © SEDACUSCO

4.2 Dutch Water Operator Partnerships: climate change mitigation through CO_2 footprint reduction

Key messages

- **The long-term, peer-to-peer approach of Water Operator Partnerships (WOPs) has proved to be a successful form of collaboration that can achieve sustainable results.**
- **Solidarity mechanisms that successfully mobilize and allocate dedicated resources to a WOP can help WOPs flourish and scale**
- **WOPs can contribute to climate change adaptation and mitigation.**

Peer-to-peer collaboration is the basic concept underpinning Water Operator Partnerships (WOPs). Through WOPs, Dutch water operators are supporting water operators in Africa, Asia and Latin America to strengthen their financial, technical and social sustainability. WOPs work through peer-to-peer exchange of skills, knowledge and goodwill to build the capacity of a utility that asks for assistance or guidance. Dutch experts team up with experts from the partner utilities on a variety of topics, including energy efficiency.

Improving energy efficiency is one of the main objectives of a long-term (2017–2030) WOP formed between VEI and the National Water and Sewerage Corporation (NWSC) in Uganda. VEI is a not-for-profit organization that implements peer-supported partnerships between seven Dutch partners – Vitens, Evides Waterbedrijf, WML, Waterbedrijf Groningen, Brabant Water, WLN and PWN – and water operators worldwide. Under the WOP between VEI and NWSC, the partners apply asset management principles and introduce asset management information systems to support the NWSC's efforts to continuously improve its operational performance and investment planning so as to sustain and extend water and sanitation services in rapidly growing supply areas.

The WOP employs a similar approach to that outlined in the WaCCliM roadmap (Box 2), following the five steps of why, assess, opportunities, implement and monitor. VEI, NWSC, a local contractor and a local engineering company collaborated to conduct energy assessments of water systems in nine towns in northern Uganda. The main reasons for performing these energy assessments (step 1 of the WaCCliM roadmap: why?) were:

- The high energy costs of water supply systems in small towns;
- The high specific energy consumption (kWh/m3) by these supply systems;
- The unreliable conventional energy supply in remote areas.

The assessment (step 2: assessment) identified many opportunities (step 3: opportunities) to improve energy efficiency, including through:

- Increasing the technical knowledge and safety awareness of NWSC staff by arranging training sessions;
- Implementing asset management;
- Increasing knowledge and improving lifecycle management of boreholes;
- Replacing pumps and/or distribution systems for optimum efficiency and reduction of energy consumption/costs and carbon footprint;
- Repairing solar supply systems, implementing new systems where possible and improving the management of these systems;
- Implementing a structural method of energy assessment and assessing the other water supply systems of NWSC.

Based on the findings of the assessment, the following solutions have been implemented (step 4: implementation) so far:

- Provision of several training sessions for 80 local staff and staff at NWSC's main office;
- Execution of a technical improvement plan funded by the Ugandan national Service Coverage Acceleration Programme (SCAP 100) project and the Dutch Sustainable Water Fund;
- Design, construction and handing over of a number of refurbished water supply systems with a solar energy supply;
- Assistance with implementing borehole management, including geological research, design, supervision of construction and operation as well as maintenance of abandoned or exhausted boreholes. Four new solar systems have been installed, each system saving around 18 kW of conventional electrical supply (Figure 2). The new systems continuously collect data to enable effective management of boreholes (step 5: monitor).

BOX 4: SOLIDARITY MECHANISMS

The impact and success of WOPs depend on the contribution of different stakeholders. A WOP is a partnership and exchange between a mentor utility and a mentee utility, enabled by the utilities themselves, by government and by donors. These enablers ensure that the WOP can mobilize its own financial resources. Such resources are critical since they allow the mentor and mentee utilities to be driven solely by operational performance improvement and utility demand, and not by the objectives and needs of others.

In Europe, several 'solidarity mechanisms' successfully mobilize and allocate dedicated resources to WOPs. Successful solidarity mechanisms consist of three elements:

- A political policy, regulation or incentive to allow and enable utilities to mobilize their own resources for use by WOPs;
- Utility shareholders/boards of directors that support solidarity mechanisms and prioritize corporate social responsibility;
- A structure to manage the mobilized finance and a mechanism to allocate the resources to WOPs.

WOPs flourish and scale if these three enabling factors are in place.

In Europe several solidarity mechanisms have been developed and are successful. In France, the national 1% solidarity law allows and enables local governments to reserve 1% of the local community budget for international solidarity projects. French utilities acquire finance from this community solidarity budget to finance their WOPs and exchange activities.

In the Netherlands, the national government has a policy to encourage Dutch utilities to reserve up to 1% of their turnover and pool this in a solidarity fund. The fund is managed by a specific organization or by the utility itself and the resources are allocated to a portfolio of WOPs. The management organization acquires additional cofinance, to scale the WOPs. Dutch utility customers can also opt to support development activities through Water for Life, the tap water fund of Dutch utility customers.

In the UK, private utilities mobilize resources through fundraising campaigns among the British public. The NGO WaterAID manages a global programme to meet SDG 6 that is financed by the money raised. WaterAID also acquires additional cofinance. Most of WaterAID's resources are used in lobbying programmes in developing countries, with a smaller proportion allocated to setting up and managing WOPs. WaterAID also sources UK utility experts for short-term missions. To upscale existing WOP efforts, the UN Global Water Operators Partnerships Alliance (GWOPA) helps water operators help one another to provide quality services to all.

Peer to Peer collaboration in a WOP, Zimbabwe © VEI

4.3 Hamburg's water utility contributions to the city's ambitious climate plan

Key messages

- **Water utilities are very energy intensive and incur high energy costs. Improving the energy efficiency of water utilities is therefore an economically viable contribution to climate change mitigation.**
- **An ambitious climate plan forces local actors towards an increased level of collaboration.**

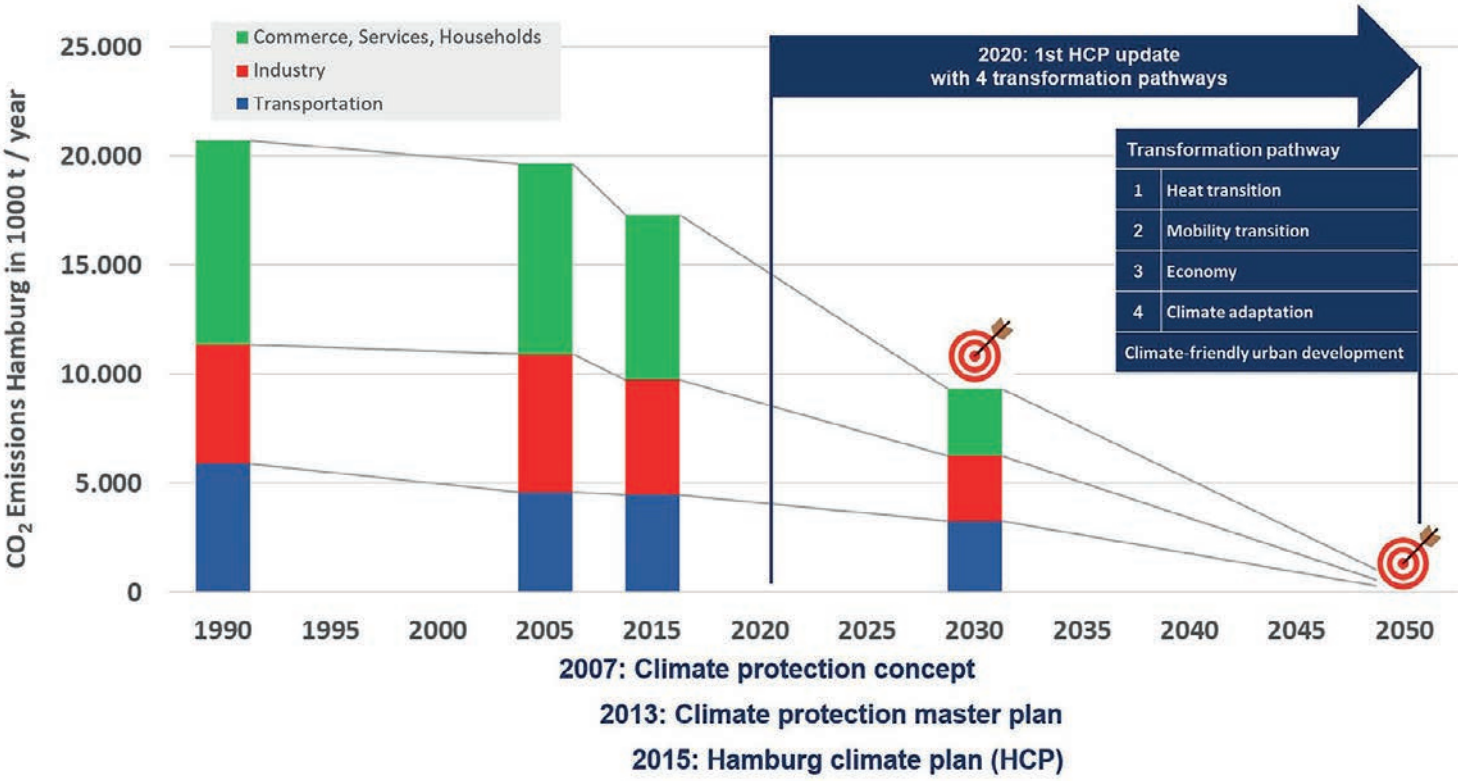
Thirty years ago, climate change was not the main driver of action to reduce the energy costs of water utilities – constantly rising energy bills were. At that time, in the German city of Hamburg, Hamburger Stadtentwässerung (HSE), the city's public unit for urban drainage and wastewater, and Hamburger Wasserwerke (HWW), its publicly owned water supply company, were the largest urban energy consumers in the city, together consuming as much energy as a medium-sized city. One of the major consumers of energy was the wastewater treatment plant. Now, thanks to action to improve its energy efficiency, the plant produces some 30 million kWh more energy than it consumes, captures methane and converts biogas into fuel.

Today, for HAMBURG WASSER – itself a good example of close cooperation (Box 4) – climate change is becoming an increasingly important issue, and so is collaboration. During the company's annual press conference in early 2020, its CEO Nathalie Leroy emphasized its enormous local responsibility – it has to fulfil its water mandate for more than 2 million people in the metropolitan area of Hamburg regardless of future climate conditions.

However, being fully owned by the Free Hanseatic city of Hamburg, Hamburg Wasser also has specific responsibilities towards its shareholder. It must maintain high service levels as well as financial strength and, simultaneously, contribute to the city-state's ambitious climate plan, updated in December 2019. The binding legal framework for this plan is provided by the city-state's climate protection law, which was itself updated in February 2020. It sets targets for the city-state to reduce its carbon emissions by 55% by 2030 and to become carbon neutral by 2050.

By defining four transformation pathways with numerous action programmes for heating (and cooling), mobility, economy and urban infrastructure adaptation (Figure 2), the plan forces local actors towards an increased level of collaboration.

Figure 2: Hamburg's pathway to carbon neutrality



BOX 5: A COLLABORATION CASE: THE FORMATION OF HAMBURG WASSER

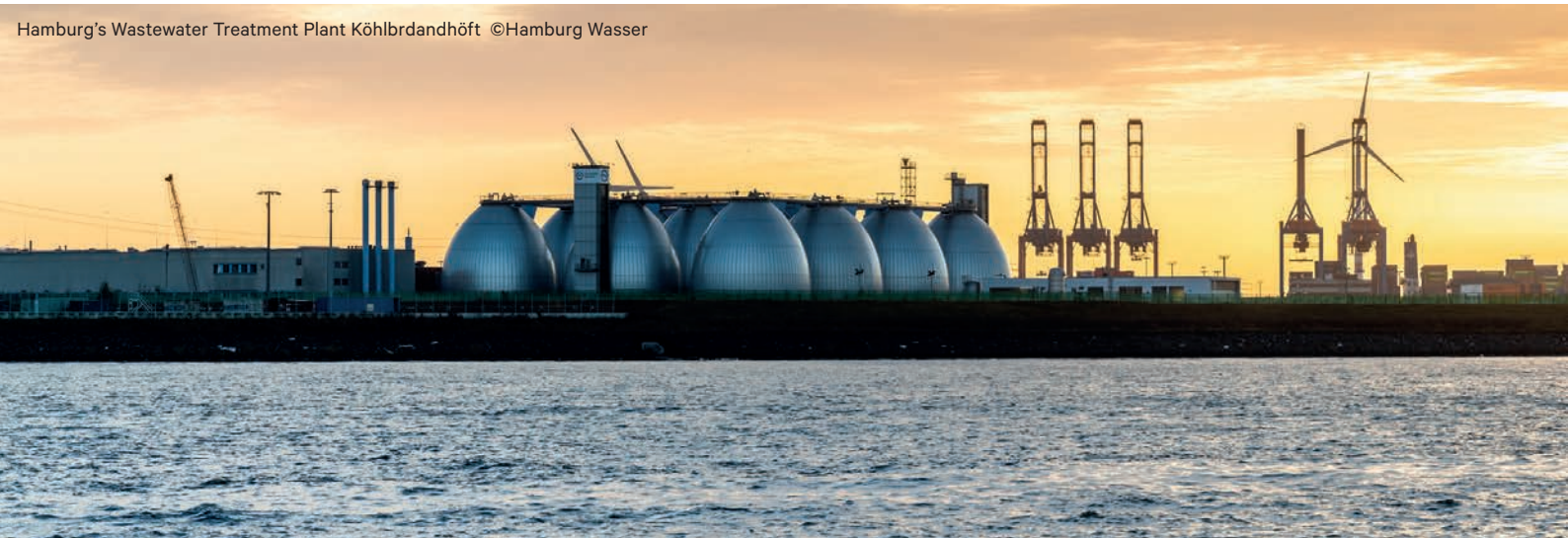
In Germany, the supply of drinking water and the management of wastewater and urban drainage is usually operated by separate legal entities, and until 2006, HSE and HWW were separate companies. Their status then changed and together they formed HAMBURG WASSER, a "Gleichordnungskonzern" according to German law, made up by two legally separate units working closely together under a unified control, but without a parent company. Together they and their subsidiaries employ 2384 people and, in 2019, the Hamburg Wasser group generated a turnover of EUR 843 million.

For example, urban infrastructure adaptation links mobility (fewer cars, but more electric cars) with green energy and charging stations (both partially provided by Hamburg Energy, a wholly-owned subsidiary of Hamburg Wasser). It also links with the blue-green design of roads and public places as part of building a sponge city that can deal with both severe droughts and heavy storm water events, something that is a major challenge for Hamburg Wasser.

As part of the heating transformation pathway, energy specialists inside and outside the company are increasingly collaborating with geologists and water specialists in building a unique system for geothermal district heating, replacing an outdated carbon-fuelled energy plant. The system combines deep geothermal energy, solar energy and excess heat from industrial processes, which is transformed by huge heat exchangers and stored during the summer months in a very large ATES (aquifer thermal energy storage) site. Energy specialists are also collaborating with wastewater treatment specialists to continue the conversion of Europe's largest wastewater treatment plant into a carbon-neutral combined wastewater treatment and power plant.

To contribute to the city's target of reducing its carbon emissions by 55% by 2030, HAMBURG WASSER has set itself the goal of saving 3.1 million kWh of electricity compared to present levels of consumption, and reducing emissions by more than 90% compared to 1990, by 2025. Its self-generation energy target is being increased from just over 70% to around 90%, which will be met through the expansion of renewable energy generation plants as well as the energy-efficient conversion of existing plants. However, on its road towards climate neutrality, HAMBURG WASSER must also consider emissions in all upstream and downstream processes relating to drinking water supply and wastewater disposal, always ensuring the financial viability of associated projects.

HAMBURG WASSER is not the only municipal company acting in this way. Another example is Hamburg's municipal heat supplier Hamburg Wärme. In close cooperation with industry partners (Vattenfall, Shell, Mitsubishi Heavy Industries), it is planning to build a green hydrogen hub on the site of the former Hamburg coal-fired power station Moorburg, which will host one of the world's largest producers of green hydrogen.



Hamburg's Wastewater Treatment Plant Köhlbrdandhöft ©Hamburg Wasser

4.4 The Bolivia WATCH programme: cross-sectoral collaboration at watershed level for resilient and integrated achievement of SDG 6

Key messages

- **Strengthening cooperation on WASH and WRM (Water Resources Management) is vital to build climate resilience in the water sector. Cross-sectoral collaboration is needed to make it happen in practice.**
- **Including WASH actors in WRM requires extra effort. However, it facilitates a dialogue on how water management decisions impact on WASH service levels in households and on vulnerability (e.g., on gender and poverty dimensions).**
- **The integrated WASH–WRM approach will foster more integrated achievement of SDG 6 targets, by enabling synergies and managing potential trade-offs between**

The efficient management and protection of water resources requires WASH services to be coordinated with other sectors, such as municipal territory planning, the production industry, agriculture, mining and energy. Water Resources Management (WRM) can support this coordination. However, in most WRM no comprehensive consideration is given to improving WASH services or infrastructure. Similarly, in WASH development, the typical planning geography is the spatial extent of communities, beginning at the water supply capture point and ending at the wastewater discharge.

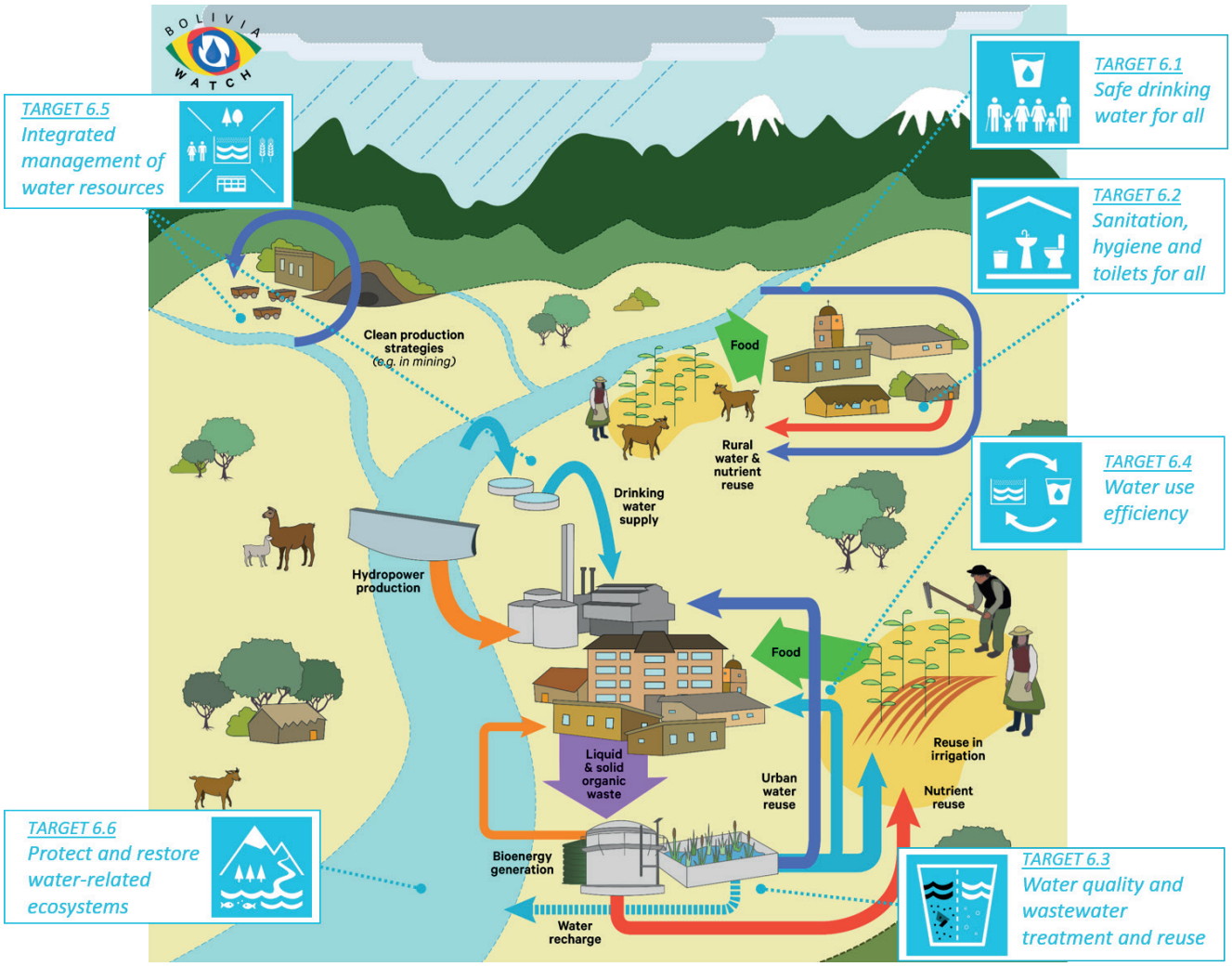
This lack of coordination is also reflected in the way that SDG 6 targets are generally managed in silos. For example, utilities and water engineers deal with wastewater management (target 6.3); the agricultural sector and water utility sector work independently to increase water use efficiency (target 6.4); and most development organizations are focused on the supply of WASH services (targets 6.1 and 6.2). However, all these targets are closely interlinked in terms of water management at the watershed level (Figure 3). A decision concerning a single SDG 6 target is likely to produce impacts on other targets, both positive and negative. Consequently, it is vital to enable collaboration across sectors to achieve SDG 6 targets in an integrated manner, to explore potential synergies and to manage potential trade-offs between water sectors. This is particularly important considering the need to build more resilient water systems to address climate change impacts on water resources.

In Bolivia, the WATCH programme led by the Stockholm Environment Institute (SEI) and funded by Sida, the Swedish International Development Cooperation Agency, seeks to facilitate integrated analysis and planning of WASH and WRM in the Tupiza watershed and two other pilot watersheds. Both existing

BOX 6: BEYOND SDG 6 – MULTIPLE DEVELOPMENT OBJECTIVES TO SUPPORT CROSS-SECTORAL ENGAGEMENT

In many situations, integrated planning encounters difficulties in building consensus for a common watershed vision, focusing instead on narrow water resource management. This can be a lengthy process, which may hamper the chances of achieving operational and implementable plans. In contrast, the SEI-led Bolivia WATCH programme has taken a cross-sectoral, inclusive approach to developing watershed plans. In an inclusive process, the different sectoral objectives can coexist alongside recognition of each sector's connections with WRM. The inclusive approach opens constructive dialogues between sectors, giving rise to opportunities for innovative and integrated solutions. Hence, shifting towards synergies, instead of negotiating cross-sectoral trade-offs, will be crucial in progressing towards fully achieving the global development goals.

Figure 3: Visualizing the integrated approach of the Bolivia WATCH programme and connections across SDG 6 targets



and newly developed SEI decision support tools are used to evaluate new watershed and WASH strategies under current and future conditions.[8] The WEAP (Water Evaluation and Planning) tool,[9] in which the overall watershed characteristics are modelled, is linked to REVAMP (Resource Value Mapping)[10] to assess resource recovery potential, and to a new tool called WASH Flows. WASH Flows models the impacts on water quality and quantity of inadequate sanitation and wastewater management in urban and rural areas. The results emerging from the integrated analysis have illustrated its potential to support decision-making by showing how specific WASH investments can support the protection of water resources, while also enabling more equitable and resilient water and sanitation supply, all the way down to household level.

However, to make sure that integration does not stop at the development of a new model, it is also important to engage cross-sectoral actors representing crucial water governance areas. As well as establishing the inter-institutional platforms that are a formal Bolivian requirement to support the implementation of watershed plans, Bolivia WATCH has created a comprehensive partnership to develop the plans. This partnership includes community-based and national authorities, utilities, universities, NGOs (national and international) and local stakeholders (representing diverse actors in the watershed, such as farmers and mining associations) (Box 6). The COVID-19 pandemic has created challenges to maintaining the participatory approach, and further strengthening of local partner

8 Read more: www.sei.org/projects-and-tools/projects/bolivia-watch/
9 https://www.weap21.org
10 https://www.sei.org/projects-and-tools/tools/revamp/

4.5 Strengthening WASH systems and mitigating climate change through social entrepreneurship and sustainable sensitization

Key messages

- **Committed and synergy-oriented people and partnerships successfully bring different stakeholders together.**
- **Lasting change can only be reached with global and local actors.**
- **Success largely depends on the ability to collaborate and exchange with, and learn from, different stakeholders.**

BOX 7: WATER FOR ALL – ALL FOR WATER

Viva con Agua (VcA) is an activist NGO that aims to provide basic drinking water, sanitation and hygiene services. It also aims to enable WASH awareness and knowledge, and WASH-related social entrepreneurship. VcA uses the universal languages of music, art and sport to create common points of contact, reaching out to young people through occasions they enjoy, such as festivals, concerts and sporting events. In this way, it encourages sustainable sensitization and networking among a new generation of activists.

Soulbottles manufactures and sells plastic-free bottles to be filled with tap water. Soulbottles aims to optimize waste management and CO_2 emission neutrality and to strengthen female empowerment and social entrepreneurship. It has donated more than EUR 1 million from the sales of 1 million bottles towards VcA's WASH projects.

'Spouts of Water' is a Ugandan company. Founded by young professionals, it manufactures and distributes ceramic water filters to provide everyone in Uganda with safe water.

Activating civil society for global sustainable development in the WASH sector is a key goal of Viva con Agua (VcA) (Box 7). In 2020, the COVID-19 pandemic led to the cancellation of the enjoyable activities it uses to mobilize its young supporters, such as festivals, concerts and meetings between volunteers. Funding normally raised during these events dried up. As a progressive fundraiser, VcA had to find a new way of engaging its supporters, and it quickly did so. It launched a 36-hour online festival called "Stream4Water", creating a global platform to stream live events and raise funds for WASH projects.

With the funds raised during its first online festival, VcA supported a project with its Ugandan partner 'Spouts of Water' (Box 7). Donations had amounted to double what had been expected, meaning that 1000 Spouts water filters could be distributed to households most in need of safe drinking water in Kampala City.

VcA also made an impact investment in Spouts. By investing in this business model, VcA and its partners can support Spouts scale up to the East African market and, above all, scale up the impact on WASH and the climate.

By 2025, VcA and Spouts aim to:

- Provide access to safe drinking water for between 4 and 5 million people in East Africa.
- Help Ugandan households save money, because they will no longer need to buy fuel for boiling water.
- Use emission-free water purification and, as a result, protect forests and save hundreds of thousands of tons of CO_2.

Reaching these goals requires cooperation with partners. Success will depend on being able to collaborate and exchange with, and learn from, different stakeholders. Lasting change will only be achieved through both global and local actors.

To encourage partnership and collaboration, VcA has worked with its longstanding partner soulbottles to offer a grant for a WASH project that merges the main aims of both VcA and soulbottles, with a strong focus on previously neglected issues, such as waste management and climate protection. Having received many applications for this funding, VcA ultimately awarded the WASH'n'Soul grant to BORDA Zambia, forming an equal partnership of mutual learning and empowerment. The project will work towards making the human right to water and sanitation a reality through sustainable access to WASH services while at the same time establishing and incorporating structures and concepts for waste management, social entrepreneurship and climate protection. Climate protection is an important part of the project, which includes plans for using solar energy, establishing urban gardening initiatives in schools, developing biogas plants to produce gas for cooking in school canteens and general planning for CO_2 emission neutrality. The partners also intend to use carbon-offsetting measures such as reforestation to compensate for CO_2 emissions caused by the project implementation.

Delivery of Spouts filters in Kampala City © Viva con Agua

4.6 The Sustainable Services Initiative: systems thinking to ensure sustainability

Key messages

- **The active involvement of new partners from new sectors helps to get organizations out of their silos and move them towards wider WASH systems thinking.**
- **Leveraging existing networks increases their impact and effectiveness.**
- **Meaningful engagement with all stakeholders in a system enhances the likelihood of achieving sustainability.**

Although the German NGO Welthungerhilfe does not focus exclusively on WASH, it recognizes that sustainable WASH systems require more than just technologies. In 2016, in partnership with VcA, Aguaconsult and the German Toilet Organization, it launched an internal programme, the Sustainable Services Initiative (SSI), seeking to improve the long-term sustainability of its WASH programmes. The aim of this collaborative approach was to actively involve new partners from new sectors, to leverage the partners' networks to increase impact and effectiveness in the quest to reach SDG 6, and to use new methods and get out of siloed ways of thinking towards a wider consideration of WASH systems.

The SSI aims to improve the sustainability of WASH programmes primarily by encouraging the uptake of a systems-strengthening approach (Box 8). Because no single organization can do all that is needed, the approach requires collaboration between different organizations across multiple sectors.

Through systems-strengthening programmes in Uganda, Nepal, Ethiopia, Malawi and Kenya, currently more than 1 million people benefit from the improved WASH governance on district level.

The SSI also advocates across the WASH sector and partner countries for a more sustainable approach to WASH programming. It seeks to add value to the wider sector in terms of WASH systems thinking through participation in collaborative efforts such as the Agenda for Change, a global hub that works collectively to advocate for and support national and local governments in strengthening WASH systems.

Figure 4: The nine functional areas of a WASH system assessed by the systems-thinking approach, and the key stakeholders involved

BOX 8: THE BUILDING BLOCKS OF SYSTEMS STRENGTHENING

Using systems thinking, the WASH system is divided into nine functional areas or building blocks (Figure 4). To identify where sustainability can be improved, a comprehensive analysis of each functional area is carried out in close collaboration with key stakeholders, such as local and national authorities. When systems and capacity assessments are undertaken in a participatory and collaborative manner with stakeholders in a system, it can help them reflect on challenges that they may not have considered previously, gain consensus on how to address them and define the key activities required. Only when the stakeholders involved collaborate in a meaningful manner will a long-term, sustainable WASH system be feasible.

Rural community, Tupiza Watershed, Bolivia © SEI

5. Conclusion and outlook

The case studies presented are quite different in terms of scope and geography. Nevertheless, some key conclusions can be drawn with regard to collaboration.

- Effective institutional collaboration, as shown in the Peruvian case study, requires a facilitating regulatory framework. Within such a framework, an ambitious climate plan, such as that presented for the city of Hamburg, can oblige local actors to increase their collaboration, something that is vital for success.
- The long-term peer-to-peer approach of WOPs, supported by an appropriate "solidarity mechanism" to provide dedicated funding, is a proven, powerful collaboration tool capable of delivering sustainable results.
- Cross-sectoral cooperation on WASH and WRM, as described in the Bolivian case study, requires extra effort, but also generates added value for the implementation of the SDG 6 targets by creating synergies and reducing potential trade-offs between water and climate targets.
- Existing networks can increase their impact and effectiveness. The active involvement of partners from new sectors helps to get organizations out of their sectoral silos, as shown by the SSI.
- The approach of VcA shows that lasting success largely depends on personal and organizational capability to collaborate and exchange with, and learn from, different stakeholders at global and local levels.
- Low-carbon and climate-resilient water and sanitation services are technically feasible and economically viable at many levels of collaboration.

These case studies are just a few examples of a variety of collaboration models and initiatives that fall within wider efforts to support cross-sectoral collaboration. For instance:

- The SSI programme is embedded into the broader "Agenda for Change",[11] a collaboration of like-minded organizations that have adopted a set of common principles and approaches.
- GWOPA is a members' association, institutionally anchored within UN-Habitat, working towards enabling WOPs in the areas of communication, advocacy and finance.
- Innovative cross-sectoral approaches, such as those shown in the Bolivian case for WASH and WRM cooperation, can be viewed as an extension of Integrated Water Resources Management processes defined by the Global Water Partnership.

Without question, further expansion of cross-sectoral collaboration is necessary, developing greater synergies between the relevant sectors. The political argument for more cooperation is simple. However, implementing it practically at the operational level requires adaptation of organizational structures and decision-making processes. As well as the opportunities linked to cross-sectoral collaboration, there is also the risk that processes become too complex (and thus difficult to control) and inefficient. So, while an expansion of cross-sectoral approaches is needed, it must be done proportionately and with due consideration of opportunities and risks.

How can further improvements be achieved? The SDG Partnership Guidebook, a product of the 2030 Agenda Partnership Accelerator,[12] describes three steps in developing a partnership-enabling ecosystem:

11 https://washagendaforchange.org/
12 The 2030 Agenda Partnership Accelerator is a collaborative initiative of United Nations Department of Economic and Social Affairs (UN DESA) and The Partnering Initiative (TPI), in collaboration with United Nations Office for Partnerships, UN Global Compact, and the UN Development Coordination Office.

Participatory problem formulation in Tupiza watershed © SEI

- Raise understanding and build partnering skills and competences.
- Support the organizational change needed for institutions to become “fit for partnering”.
- Draw out good practice and support the development of efficient SDG partnership platforms, thereby creating the mechanism through which governments and the UN can systematically engage and partner with business and other development actors.

These steps can be applied to strengthen collaboration in the water and sanitation sector, with a stronger focus on sustainable systems and the climate change nexus. This, in turn, will significantly contribute to climate change mitigation and adaptation efforts in the sector.

Governmental and non-governmental organizations must be encouraged to improve their efforts to promote formal frameworks for collaboration as well as informal dialogues, and to enhance the capabilities of existing and new platforms towards an increased use of modern collaboration tools.

The United Nations World Water Development Report 2020 (Water and Climate Change) states that the need for greater collaboration between the water and climate communities reaches beyond the realm of scientific research. This is abundantly clear at the policy level – most obviously in the fact that the term ‘water’ is completely absent from the Paris Agreement, and that only a very limited number of NDCs include the ‘intention’ of preparing a specific water plan.

Much of the funding available from climate change funds has been earmarked for mitigation efforts. Consequently, these funds have been difficult for water projects to access in the past, as project developers concentrated on adapting to the consequences of climate change rather than on the reduction of GHG emissions. Connecting water more closely to climate change would allow countries to leverage additional resources to address the significant overlap between climate and water challenges. Therefore, the water community must focus its efforts on promoting the importance of water in terms of both climate change adaptation and mitigation, and develop concrete water-related project proposals for inclusion in NDCs. To make this happen, enhancing knowledge, capacity and collaboration will be crucial.

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