



Case Study - Peru

Planning locally , impacting globally - How Water and Wastewater Utilities in Peru are facing Climate Change

Activity

Development and application of climate planning methodology to reduce the carbon footprint and vulnerability of water and wastewater utilities

Country

Peru

Sectors

Water and wastewater

Challenges

Lack of tailor-made planning methodology and tools

Good Practice

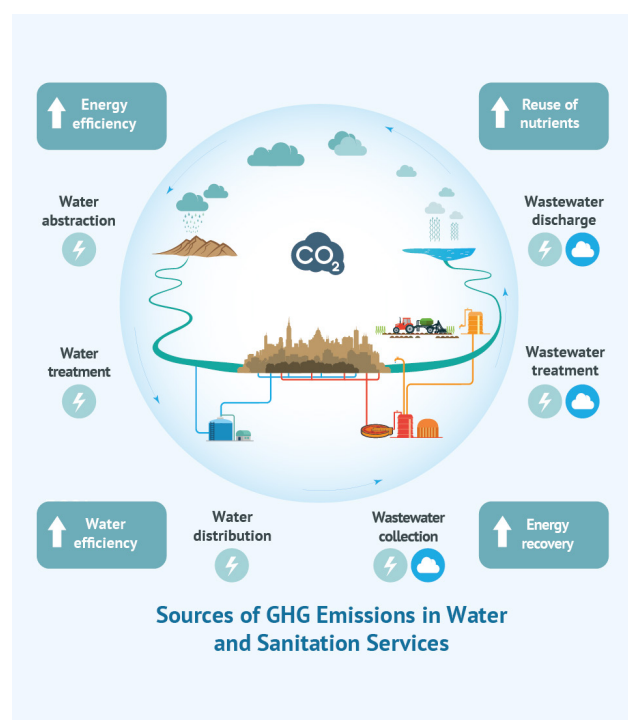
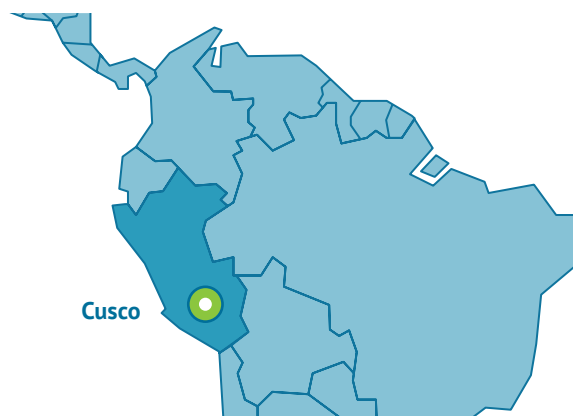
Applying standardised methodology and web-based tools for facilitating water and wastewater utilities' climate planning process

Timeframe

2014–2018

Case Summary

How to ensure water and sanitation services delivery under a climate change context? The climate change mitigation and adaptation plans (PMACC; Planes de Mitigación y Adaptación al Cambio Climático) are tools to address this challenge. PMACC identify main carbon emissions sources and higher climate risks throughout the urban water cycle, along with water utilities' opportunities to boost a positive change towards climate neutrality and adaptation. Following a standardised methodology and supported by web-based tools, the planning process becomes quicker and generates a report to informing decision-makers. This planning approach enabled some water utilities in Peru to start searching for practical carbon emissions reduction solutions, such as water utilities in Cusco and Ayacucho. The PMACC initiative was developed and implemented collaboratively between WacClim¹ (responsible for mitigation) and PROAGUA II².



Background

Access and quality of drinking water and sanitation services have been considered by the Peruvian government as one of its top priorities, recognising their importance for public health, overcoming poverty, economic development and climate protection. Droughts, precipitations and mudslides, whose frequency and intensity are accentuated by climate change, highly impact basic service delivery, affecting water's availability and quality or damaging infrastructure. In addition, operating the systems for supplying drinking water to users and treating their wastewater, generates greenhouse gas (GHG) emissions which magnitude depends, among other things, on energy consumption requirements and treatment technology selection. Planning services, considering climate change adaptation and mitigation strategies will contribute to service sustainability and thus directly benefit many thousands of Peruvians.

Moreover, it offers a great opportunity to demonstrate how the water sector can contribute to meet the targets of the 2030 Agenda as well as municipal wastewater management to Nationally Determined Contributions (NDC).

Challenges

The challenges to transform utilities into climate protection and sustainability leaders through climate mitigation strategies are, among other things, the following: scepticism on mitigation measures' benefits, limited access to GHG emissions information, knowledge gaps in low-carbon technologies selection, operation and maintenance, restrictions to cover investment and operating costs and the lack of cooperation mechanisms among WWUs and between utilities and research institutes as well as universities.

Activities

Since 2014, the WaCCliM project has assisted the General Directorate of Environmental Affairs (DGAA; Dirección General de Asuntos Ambientales) under the Ministry of Housing, Construction and Sanitation (MVCS; Ministerio de Vivienda, Construcción y Saneamiento), for developing and implementing a methodological process to help utilities on drawing up their PMACC, suitable to the utilities' different contexts, sizes and locations. The PMACC initiative was developed and implemented under collaboration between WaCCliM y PROAGUA II.

Raising awareness on climate mitigation opportunities

Motivated by the COP20 held in the country, the personnel of government entities and WWUs have attained a better understanding of links between climate change and the water sector and how mitigation measures relate directly to service delivery (i.e. odour control, operating costs reduction, operational efficiency, sludge management). Since then, they have been more willing to participate in the climate planning process and contribute to global objectives (2030 Agenda and NDC).

Development of a conceptual and methodological framework

The PMACC developed under an integrated and novel approach, help utilities to identify the main carbon emissions sources and climate risks in service operations; as well as the most cost-effective measures for reducing these emissions and risks within a short, medium and long term. Acknowledging its importance, the climate mitigation approach was integrated in the management and provision of sanitation services' implementation act .

The **virtual PMACC Guide Tool** assists WWUs to determine carbon emissions, as well as threats throughout the urban water cycle, outlining the possible effects and risks. As a second step, the guide helps to identify critical facilities and actions to be taken, both to reduce carbon emissions and to protect facilities from threats over services operation. This simultaneous analysis of mitigation and adaptation allows prioritising actions, taking into account co-benefits and avoiding counter effects. Finally, the virtual PMACC Guide Tool generates a report on the analysis carried out, including a technical description and associated costs of measures.

Development of training materials and workshops

Promoting the horizontal exchange of WWUs, among comparable pairs according to size, geographic region, and capabilities.

Technical assistance for measures implementation

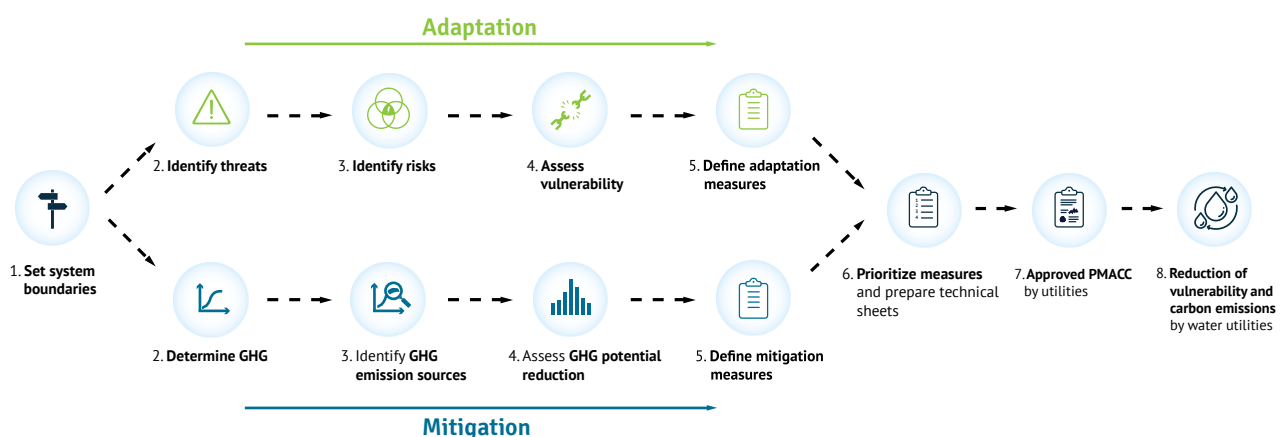
Supported by the WaCCliM project, some companies have begun to develop best practices for reducing carbon emissions, for instance the water utility of Cusco – SEDACUSCO. At the San Jeronimo wastewater treatment plant (WWTP), the anaerobic sludge digester's operation has been optimised, thus increasing the production of biogas, used for sludge heating (25%) and flaring the rest (75%).

Establishment of cooperation mechanisms between the water company and the academy

such is the case of the water company of Ayacucho - SEDA Ayacucho along with the San Cristóbal de Huamanga National University and the Technische Universität Carolo-Wilhelmina zu Braunschweig, supported by the German development cooperation, implemented by GIZ, aiming at exchanging skills and knowledge between WWUs and academia, finding solutions to technical wastewater treatment problems, under the context of climate change.

Institutions Involved

The WaCCliM project cooperates with the Ministry of Housing, Construction and Sanitation (political partner,) and with SEDACUSCO (pilot utility) at the local level; as well as with other country utilities for the project approach's replication, such as the case of SEDA Ayacucho.



Under MVCS, the DGAA is responsible for the environmental management of the national water sector. DGAA's staff has internalised the climate change topic and as taken a pioneering role to integrate the climate variable into the sector's management instruments (PMACC Guide). In addition, in collaboration with the Technical Organism for Sanitation Services Administration (OTASS; Organismo Técnico de la Administración de los Servicios de Saneamiento), provided technical assistance to WWUs for drawing up their PMACC.

Similarly, supported by WaCCliM, Peruvian WWUs have developed capacities in the subject of GHG mitigation, which will allow better service provision planning, under a context of climate change, through the PMACC.

The pilot utility SEDACUSCO is at the forefront of climate neutrality among WWUs in Peru, and contributes significantly to drive this issue nationwide.



Financing

Through the PMACC, WWUs identify and prioritise climate mitigation and adaptation measures, this information serves as the basis for developing technical sheets, which include a technical description of the prioritised measures and associated costs. Based on the required amount of investment for implementing the measures, potential sources of financing are explored and identified. For instance, SEDACUSCO has invested 528,000 EUR, financed by own resources, aiming at operational improvements in the anaerobic sludge digester and thus, reducing sludge management and disposal costs, controlling odours and reducing their carbon emissions.

Impacts

National government entities and WWUs have increased awareness on climate change and its link with the water sector, understanding how climate planning is related to bigger goals (national and global) and pioneering the integration of this approach with the sectoral planning.

All WWUs in the country have received technical assistance to draw up their PMACC, according to their local contexts, supported by the virtual PMACC Guide Tool.

23 companies have completed their PMACC that will serve as input for long-term planning within WWUs, offering new opportunities to implement mitigation and adaptation measures.

The pilot utility SEDACUSCO has managed not only to control odours that generated a nuisance for the population, but also to reduce its annual GHG emissions by 5,300 tons of carbon per year, equivalent to 2,200 round-way flights Lima – Frankfurt-Lima of one person. In the future, the company considers using biogas to generate energy and thus obtain significant annual savings of 256,000 EUR in electricity costs, and additionally avoid 544 tons of carbon per year.

Success Factors

Political willingness, a key aspect to carry out the PMACC process was the commitment of the MVCS to develop the regulatory framework that incorporates climate adaptation and mitigation approach into sectoral management instruments. Thus, ensuring process continuity.

Availability of tools, having the tools (PMACC and ECAM) allowed the utilities to apply a standardised methodology and generate a report of useful information to inform decision makers.

Bottom-up approach, validating the PMACC methodology with WWUs allowed the development of a practical guide, oriented towards service providers, identifying practical solutions.

Cooperation between water companies, and the academy, adapting low carbon technology to the country local conditions requires a joint effort between WWUs and the academy.

Obstacles Overcome

Perception of higher costs, many service providers were not willing to incorporate mitigation and adaptation measures into their investment projects because they imagined that it would cost more than conventional technology in the short and long term.

Scepticism about subject relevance, many utilities' personnel did not understand the PMACC benefits, but when they understood how these issues are directly related to the service provision, they were more willing to participate in the process.

Lessons Learnt

Assess effects and causalities, the PMACC methodology validation showed that cause-effect chains improve the utilities' personnel understanding of how the measure (mitigation / adaptation) can achieve the change and thus, improving both, the design of the measures and their follow-up during the implementation phase. In addition, it helps to visualise the multiple benefits of climate measures (e.g. energy efficiency, process optimisation, odour control, sludge management, and operating costs reduction).

Monitor parameters according to local needs, regarding GHG monitoring it is important that utilities start with a series of parameters appropriate to their needs. Some of the ECAM parameters are more advanced and may be appropriate for the future. The most important thing is not to become paralysed by the universe of parameters and just start with the key ones.

Start with the easiest measures and progress in time, the PMACC methodology allowed the utilities' personnel to understand the opportunities for service operation improvements, reflect on service level provided, identify multiple benefits and based on that make capital and operational decisions to increase resilience and reduce their carbon footprint.

Link the measures to bigger goals, climate mitigation and adaptation measures are not necessarily new practices, different from others already carried out by the utility, but rather provide multiple benefits. For instance, reduction of operating costs, operational efficiency, protection of water resources, odour control, increase of resilience as well as reducing their carbon emissions. That is, how climate measures help to catalyse sectoral national priorities as well as contribute to the country's global goals.

Replication

Another company that is moving towards its PMACC implementation to reduce its carbon emissions, is the utility of Ayacucho – SEDA Ayacucho, along with the National University San Cristóbal de Huamanga and the Technische Universität Carolo-Wilhelmina zu Braunschweig. This initiative was facilitated by the German development cooperation, implemented by GIZ, as a collaboration between WaCCliM and PROAGUA II.

Under this cooperation framework between the WWU and the academia, a study was carried out to assess the Totorá WWTP operating conditions, under a climate change context, and based on this, implement operational improvements as well as reducing carbon emissions. The study demonstrated that transforming the existing Imhoff tanks into upflow anaerobic sludge blanket (UASB) reactors is technically feasible, under the specific operating conditions, of Ayacucho's Andean zone in Peru. In the future, the company is considering installing biogas collection and flared systems and thus achieving a total GHG reduction of about 43%.



Wastewater treatment plant in Ayacucho, Peru ©GIZ

Best Practice

According to the current legal framework, WWUs in Peru are required to draw up their climate change adaptation plans. Here, the WaCCliM project supported to incorporate mitigation in the short and long term sectoral planning. The simultaneous analysis of mitigation and adaptation allows prioritising actions taking into account co-benefits and avoiding counter effects. Before, there were no standardised methodology and tools that could facilitate the planning process or generate a report to inform decision-makers. Applying this virtual PMACC Guide facilitates WWUs to draw up their PMACC, suitable to the different contexts, sizes and locations of the companies. Based on this good practice, Peruvian WWU have begun to search practical solutions to reduce their carbon emissions, motivated by operating costs reduction, operational efficiency improvements, odor control and sludge management, thus benefiting thousands of Peruvians. The PMACC initiative was developed and implemented by WaCCliM and PROAGUA II.

Next Steps

At the local level, SEDACUSCO was struggling to find combined heat and power system suppliers in the incipient local market but is moving towards coping with this issue by early next year. In addition to this, based on a study financed by the WaCCliM project, SEDACUSCO has successfully attained a government grant (1,56 million EUR) for replacement and maintenance of more efficient pumping systems for Vilcanota water supply system, whereby reducing additional 153,000 tons of carbon in 30 years.

While SEDA Ayacucho has started transforming one of the existing Imhoff tanks into an UASB including a biogas collection and flared system.

At the political level, the MVCS has started the process to improve the conditions that allow a favourable environment for implementing climate measures in the water sector, thus contributing to the 2030 Agenda and NDC.

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