WaterAid and SWA submission – COP30 Presidency Roadmap on Transition Away from Fossil Fuels in a Just, Orderly and Equitable Manner

This submission offers insight into how the water, sanitation and hygiene (WASH) sector can make substantial contributions to reducing global greenhouse gas (GHG) emissions and thereby support the COP30 Presidency Roadmap on Transitioning Away from Fossil Fuels (TAFF). The submission focuses its answers on question "(c)" of the COP30 President's letter but also demonstrates the overarching benefits this has for a just, orderly, and equitable transition away from fossil fuels.

Sanitation is a critical but often overlooked source of greenhouse gas (GHG) emissions. Globally, it accounts for nearly 1.3% of anthropogenic GHG emissions (Lambiasi et al., 2024), including around 9.4% of total anthropogenic methane (Cheng et al., 2022). While mitigation efforts have largely focused on energy and agriculture, sanitation is rarely included in mitigation plans. For example, SEI and SWA (2024) show that sanitation activities constitute only 2% of all activities in all countries' nationally determined contributions (NDCs), and within sanitation-related activities, only 19% are focused on mitigation, despite opportunities for innovative, easy and cost-effective ways to reduce emissions, including through methane capture.

Water is also critical, given the dependency of mitigation efforts in other sectors on water. As emphasised in the WMO submission to the Sharm el-Sheikh Mitigation Ambition and Implementation Work Programme (2024), all proposals to expand clean energy and enhance natural ecosystem GHG sequestration to achieve net-zero emissions depend fundamentally on water availability. Yet, water is often treated as a given, without rigorous scientific assessment of current and future availability or effective coordination between sectors and line ministries. This results in multiple actors relying on the same water resources without being aware of it.

To address this, it is urgent that countries integrate comprehensive water and sanitation assessments and actions into their NDCs and actively cooperate on shared water resources; otherwise, many mitigation measures risk failing. Additionally, this may lead to a severe lack of water for human needs, including WASH and food production.

Recommendations

This submission highlights several ways to reduce emissions from and related to the WASH sector. By optimising resource use, limiting waste, and improving infrastructure resilience, emissions can be lowered while delivering cost-effective solutions. Harnessing these opportunities, we recommend that countries:

- Integrate specific and measurable plans for reducing emissions from the WASH sector into NDCs and relevant initiatives, with a particular focus on direct emissions from sanitation. In many contexts, the greatest gains come from capturing methane in treatment plants and improving emptying services for non-sewered sanitation.
- Clearly plan and prioritise sanitation activities in their NDCs, to create business opportunities for investments and innovation, as well as strengthened circular economy approaches across sanitation, food, agriculture, and health sectors.
- Include integrated water needs assessments across sectors and societal functions in NDCs and NAPs. This is vital to leverage all mitigation strategies while safeguarding the human right to clean water and sanitation for all.
- Increase budget and financing for WASH sector mitigation strategies. The sector presents a largely untapped potential for TAFF, but national governments need to increase their budgets, and donor countries need to increase accessible climate finance for it. This will facilitate improved knowledge and stronger action.
- Ensure inclusive governance frameworks for WASH mitigation, including NDCs. The inclusion of different stakeholders, including marginalised groups, is vital for ensuring a just and equitable transformation of the WASH sector, which benefits all actors and leads to better solutions.

The water-sanitation sector's contribution to TAFF

Often overlooked, the sanitation sector emits at the same level as the global aviation industry (WaterAid, 2025). Despite this, only 66 of 144 countries' NDCs[1] include sanitation-related activities (SEI and SWA, 2024). The emissions from sanitation mostly constitute of methane and, to a lesser extent, nitrous oxide, which have about 25 and 300 times the global warming potential of carbon dioxide (UNICEF, 2024). Wastewater management is estimated to contribute approximately 7 per cent of the global methane emissions, and non-sewered sanitation causes at least 5 per cent of global methane emissions (Climate Resilient Sanitation Coalition and Water Initiative for Net Zero, 2024). There is very limited evidence on emissions from sanitation, particularly from non-sewered sanitation; consequently, these figures are likely vastly underestimated (WaterAid, 2025). The usage of non-sewered sanitation systems is also rapidly growing in many low- and middle-income countries, which makes this lack of data and attention even more problematic and a potential lost opportunity for substantial emission reductions (Climate Resilient Sanitation Coalition and Water Initiative for Net Zero,

[1] Based on an assessment of all activities in the updated NDCs from 144 countries available as of 31 May 2024 (SEI and SWA, 2024)

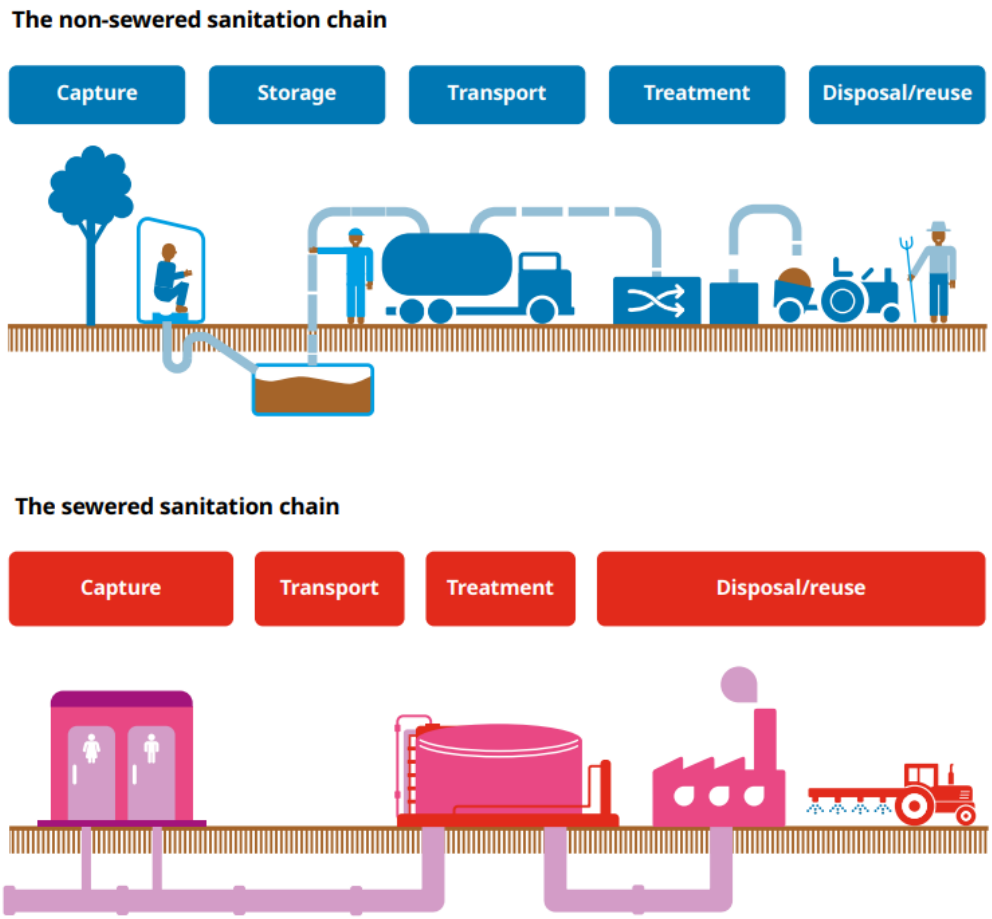
2024). Additionally, there are limited data estimates that account for the total emissions in the entire sanitation service chain.

As highlighted in the UNICEF submission to the Sharm el-Sheikh mitigation ambition and implementation work programme (2024), the emissions from sanitation systems can be divided into three categories: direct, operational and embedded carbon. The direct emissions originate from the anaerobic and aerobic processes of faecal matter in pits, tanks and sewers, as well as treatment plants. The operational emissions originate from the use of fossil fuels, including for energy, for transport and machines to process the faecal waste. Embedded carbon refers to the emissions generated by the production of WASH assets, including bricks and steel for infrastructure or vehicles for the transportation of waste.

Direct emissions represent the lion's share of sanitation emissions. They also present technically feasible and affordable solutions for reducing emissions, such as methane capture in treatment facilities and improved emptying services. In a WaterAid (2025) study of the Lahan Municipality in Nepal, it was estimated that emissions could be reduced by over 20% by implementing such solutions. It is important to understand that these direct emissions are primarily methane generated from the digestion of faecal waste, and they are particularly high under anaerobic conditions, that is, in the absence of oxygen, such as within pits, septic tanks, and treatment plants.

Emissions in treatment plants (be it wastewater or faecal sludge treatment plants) are particularly high when they rely on anaerobic treatment processes, such as anaerobic digesters. These emissions are relatively easy to avoid through methane capture (in its simple form, this means domed covers that trap the methane). The methane can then be flared, replacing methane with carbon dioxide, minimising the impact in terms of heating. But the methane can -and should ideally – be reused for energy purposes (e.g., cooking, heating, etc), which further reduces emissions if it replaces fossil fuels. This makes an important contribution to the circular economy, turning waste (and a global warming hazard) into a valuable renewable energy source, reducing reliance on fossil fuels.

When it comes to emissions from containments, i.e., pits and septic tanks, the longer the faecal waste stays in containment, the more emissions are produced. Emissions at the containment stage are difficult to capture - costly, ineffective and difficult to reach scale. That is why improving the reach of emptying services and increasing the emptying frequency is an important mitigation solution, moving the sludge and the associated emissions to treatment plants where they are easier to manage. Improving emptying services also has valuable co-benefits in terms of public health protection and preparedness against climate-related events such as floods.



Visualisation of sewered and non-sewered sanitation systems (WaterAid, 2023)

Lastly, protecting and restoring ecosystems is vital for nature's own capacity to store and sequester carbon. Freshwater and marine ecosystems like rivers, lakes, wetlands, and oceans act as important carbon sinks by absorbing and storing carbon dioxide from the atmosphere in plants, sediments, and water. Wetlands, mangroves and seagrass beds in particular can lock away large amounts of carbon over long periods, but untreated wastewater can harm these ecosystems -pollution, algal blooms, and oxygen depletion- reducing their ability to store carbon, and can even cause them to release carbon back into the atmosphere, worsening climate change.

Just, orderly and equitable transition in the water-sanitation sector and beyond

Clean water, sanitation and hygiene are fundamental for human development, societal progress, and nature protection. The provision of climate-resilient WASH services is a catalyst for a just and prosperous green transition.

> **Definition of climate-resilient WASH**
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> *Climate-resilient water, sanitation and hygiene services anticipate, respond to, cope with, recover from, adapt to or transform based on climate-related events and trends - all while striving to achieve and maintain universal and equitable access to safely managed services, minimising emissions where appropriate, and paying special attention to the most exposed and vulnerable groups.*
>
> (SWA Climate Task Team, 2025)

Climate-resilient WASH is recognised as one of the most efficient measures to improve near-term vulnerability to climate change and support climate transition in a just, orderly and equitable manner. It delivers this by providing public health services and limiting the spread of disease (IPCC, 2014; 2022). It can also contribute to improved food resilience by promoting the use of treated wastewater or biosolids for irrigation and soil improvement, which provides crops with water and nutrients while also reducing waste (SEI and SWA, 2024). Improved WASH services also advance gender equality by freeing up time for women and girls, who in many places are tasked with fetching water and caring for sick family members, to instead engage in the workforce and attend school. This brings additional benefits to economic development and prosperity. Overall, investments in WASH have proven to give a 21-times return due to their broad reach across sectors and societal functions (WaterAid, 2021).

Between 2000 and 2024, 3.5 billion more people gained access to different sanitation services (WHO/UNICEF Joint Monitoring Programme, 2026). While this is a positive development, billions of people are still not reached. WHO and UNICEF (2025) estimate that 2.1 billion people still lack safely managed drinking water, 3.4 billion lack safely managed sanitation, and 1.7 billion lack basic hygiene services.

Ensuring a just transition relies on expanding access to WASH in a way that fulfils human rights while avoiding increases in greenhouse gas emissions. Without this, the lack of access will continue to prevent individuals and societies from benefiting from the full potential of WASH, while also risking emissions-intensive development pathways.

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