



LEI Case Study



¹The Leakage Emissions Initiative (LEI) is a collaborative effort including members of the IWA Water Loss Specialists Group which seeks to quantify the impact of unmanaged leakage on avoidable carbon emissions. The end goal is to create access to new funding sources for utilities such as the MUWASA, Tanzania Water Utility, who in 2021 had a need to reduce their leakage.

To help accomplish this goal, the LEI developed a methodology to determine a utility's specific energy carbon intensity and apply this to quantify carbon emissions for each component of the standard water balance. This calculation yields what is known as a carbon balance which can be conducted annually in conjunction with a leakage reduction project, to track metric tons of carbon emissions avoided because of the leakage reduction intervention.

The impact of tackling leakage in Musoma has resulted in a meaningful positive impact for the community by improving water quality, water availability, and updating infrastructure. The city is moderately sized, with Musoma Urban Water Supply and Sanitation Authority (MUWASA) serving a population of 171,000 people in the Municipality of Musoma (Northwestern Tanzania). The MUWASA, has

approximately 22,500 service connections that used approximately 6.6 million m³ of water for the 2023 business year, 43% of which was determined to be non-revenue water. A large portion of the requisite water supply comes from Lake Victoria, and an additional analysis by its technology partner City Taps determined that more than 80% of non-revenue water was likely physical leakage.

By implementing an effective NRW program in a few selected areas, MUWASA was able to reduce their non-revenue water from 70% to 30%. Annual system input volumes decreased by nearly 108 thousand m³ and retroactively calculated carbon balance shows that the MUWASA achieve nearly 26 MT of carbon savings per annum. If they could maintain these improvements, this small project alone could achieve over 500 MT of carbon avoidance by the year 2040. That is equivalent to the carbon emissions from: 2.1 million km of driving a car, burning 250,000 kg of coal, 100 homes annual electricity usage, 0.13% of the annual power produced by a natural gas-powered plant².

These savings would be the result of improving utility practices, and updating aging infrastructure which will also lead to a reduction in electrical supply costs, water supply costs, and maintenance costs. A more efficient and profitable utility will help keep rates down for customers while also meaningfully advancing the global campaign in achieving carbon neutrality by 2050.



¹ <https://en.wikipedia.org/wiki/Musoma>

² <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results>

³ <https://dailynews.co.tz/joy-as-villagers-in-musoma-rural-get-water/>