



Project title **Optimisation of faecal sludge treatment**

Country Ghana
Target SDGs SDG 6: Clean Water and Sanitation
Partner Institution Kwame Nkrumah University of Science and Technology
 ETH Swiss Federal Institute of Technology



Background

In Kumasi, Ghana, most of the population relies on non-sewered sanitation. The generated faecal sludge is taken to the recently constructed Kumasi Wastewater Treatment Plant (KWWTP) for treatment. It is the first faecal sludge treatment plant using the modified five-stage Bardenpho process, which is designed for optimal nitrogen and phosphorus elimination.

Project goal

This research study aims to better understand the KWWTP design, operations and limitations for faecal sludge treatment using a process that is traditionally used for sewerage. The loading and treatment performance are assessed to identify potential issues or concerns. Laboratory-scale and full-scale experiments are conducted with the goal of improving nutrient elimination and optimising the plant operation. The findings will generate knowledge on the suitability of the Bardenpho process for faecal sludge treatment.

Target population and how they are impacted

Unsafely discharged faecal matter can pose severe risks to public health and the environment. In Ghana, diarrhoea is a major cause of mortality, especially for young children. Safely managed sanitation can help reduce the prevalence of diarrheal deaths and illnesses. The health and well-being of Kumasi’s three million residents can benefit from the provision of a safe, effective and sustainable faecal sludge treatment. The safety and ecology downstream of the receiving river is also improved.

How the project sustainability is ensured

In the past, wastewater treatment plants have had a high rate of failure in low-income countries. To ensure ongoing functionality, proper operation and maintenance are crucial, as well as economic sustainability. For this project, the research is designed in close collaboration with the KWWTP staff to make sure that the results can be helpful to solve their day-to-day issues. The involvement of Kwame Nkrumah University of Science and Technology (KNUST) and ETH Zurich facilitates the transfer of knowledge and insights within the sector.

Business opportunity that can result from the project

As the project is more research-focused, the focus does not lie in creating new business opportunities but rather supporting existing ones, such as Sewerage Systems Ghana Limited (SSGL). SSGL manages KWWTP and other wastewater treatment plants all over Ghana and can profit from knowledge on optimised process operations. Further, this project can be the start of a continued research cooperation. Future projects could study specific topics more in depth, such as co-composting or color removal.

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