



## Feed the Future Country Fact Sheet

Online Version: <https://www.feedthefuture.gov/article/bio-gas-systems-transform-organic-waste-nutrient-rich-fertilizer>

# Bio-Gas Systems Transform Organic Waste into Nutrient-Rich Fertilizer



Sarah Stefanos/Doreen Nampamya

Sarah Stefanos and her colleagues apply bioslurry to field plots.

About 20 miles outside Uganda's busy capital of Kampala is the town of Mpigi, a semi-rural community that grows maize and bean crops.

Like many other smallholder farmers around the country, men and women in Mpigi struggle to earn a profitable living and feed their families. Growing seasons are inconsistent - during the last season, rains arrived very late and were erratic. In addition to rainfall shortages, agricultural inputs like seeds and fertilizers can be costly, and the quality may not be very good. Although Uganda has some of the highest rates of soil fertility loss in the world, it has some of the lowest rates of fertilizer application.

"It is very serious, this problem with the soils," says Irene, a smallholder farmer in Mpigi. "It is difficult to give enough food to my family and to be able to sell. These fertilizers are too expensive."

With assistance from the [U.S. Borlaug Global Food Security Fellowship Program](#), supported by the U.S. Agency for International Development under Feed the Future, researcher Sarah Stefanos and her Ugandan collaborators decided to investigate how small-scale bio-gas systems might help smallholder farmers access quality fertilizer at a reduced cost. Biogas systems are essentially a form of composting: they use heated, airtight containers to transform organic waste (everything from cow dung to food scraps) into methane gas - the primary component of natural gas - and bioslurry, an unappetizing name for a nutrient-rich fertilizer that can help healthy and delicious food crops grow.

Stefanos and her colleagues set up field experiments to test how bioslurry would affect soil quality and crop yields. Testing samples in a lab, they found that soil quality improved and that yields were highest on the plots grown with bioslurry. Most of the time, crops treated with this organic and inexpensive fertilizer outperformed crops that had been fertilized with the traditional mix of nitrogen, phosphorous and potassium.

These field tests are piloting a promising model for other smallholder farmers in Uganda. With continued support from Feed the Future, Stefanos and her team hope to bring small bio-gas systems to more communities and empower them to "grow" their own natural, high-quality fertilizer, improving both soil quality and food security throughout the country.