



## Confronting the challenge of rising upfront costs for domestic biodigester installation among small holder farmers in Uganda.

### Summary

The market for the adoption of the biodigester technology in Uganda continues to decline due to the increasing upfront costs of installation. This jeopardises the value proposition of the biodigester technology and its multiple benefits as valuable climate, clean energy, and agricultural productivity solution. If not addressed, this phenomenon has the potential to reverse the trajectory of the gains which the biodigester technology had registered for decades. This requires strategic interventions including targeted reforms in the national policy and legal frameworks that would create an enabling environment for the small-scale farmers to install and maintain the biodigesters. A well-coordinated inter-ministerial / sectoral approach through policy and legal frameworks is critical in realizing the desired development outcomes of the biodigester technology in Uganda. Central to this nexus is the ministry of energy and mineral development (MEMD), ministry of agriculture animal industry and fisheries (MAAIF), ministry of trade, industry and cooperatives (MoTIC), ministry of finance, planning and economic development (MoFPED), Office of the Prime Minister, inter alia.

### Introduction

The small holder farmers in Uganda are faced with a challenge of the increasing upfront costs for installing domestic biodigesters. A biodigester is a system that utilizes anaerobic digestion to break down organic materials such as animal manure, crop material and food waste to produce biogas and a digestate in form of a liquid

The African Biodigester Component (ABC) project supports the growth and sustainability of a commercial biodigester sub-sector in 6 African countries- Uganda, Kenya, Niger, Mali, Burkina Faso, and Benin. In Uganda, the ABC project is implemented by a consortium led by the Netherlands Development Organization (SNV) in partnership with German Agency for International Cooperation (GIZ) and Biogas Solution Uganda Limited (BSUL), and in collaboration with the Ministry of Energy and Mineral Development (MEMD), and Ministry of Agriculture, Animal Industry and Fisheries (MAAIF).



residue (bio-slurry)<sup>1, 2</sup>. Farmers install domestic biodigesters to be able to get biogas for cooking and lighting, as well as bio-slurry to apply in their gardens and plantations as an organic fertilizer to boost soil fertility and crop yield. They also use bio-slurry as feed for their animals (fish, pigs, chicken), and as an insect repellent.<sup>3</sup>

The use of the biodigester technology enables cooking in a cleaner, healthier, and smokeless environment<sup>4</sup>. At the same time, it leads to cost savings from reduced use of expensive and unsustainable energy sources like kerosene, firewood and charcoal which are also detrimental to our environment<sup>5</sup>. Biodigester technology is also instrumental in reducing drastically, the emission of greenhouse gases in the atmosphere. With the value proposition of the bio-slurry in the equation, the biodigester technology thus, creates synergies between energy access, environmental conservation, and regenerative agriculture.

## The challenge

The biodigester sub-sector has witnessed market shifts since the beginning of 2025 to-date. This is characterized by the unprecedented increase in the upfront cost of installing a biodigester, drastic decline in biodigester installations among the potential small holder farmers and business stagnation among the biodigester enterprises<sup>6</sup>.

Several factors are responsible for this phenomenon including the rising prices of key inputs needed for the biodigester installation such as PVC pipes, bricks, cement, and skilled labour, etc. This is coupled with high costs of imported components (for example pressure gauges, lamps, meters, pumps, brooder heaters, biogas bags, etc.) especially for the prefabricated or hybrid systems. The high importation costs are also driven by exchange rate fluctuations and global supply chain disruptions<sup>7</sup>. These costs are eventually transferred to the biodigester end-users leading to a high cost of the finished product. Consequently, the rising costs have pushed the average price of biodigesters beyond the financial reach of many small holder farmers whose income cycles are seasonal and often unpredictable, thereby leading to their low adoption of the biodigester technology.

These market demand shifts have also been influenced by the recent phasing out of the two key development programmes that promoted the biodigester technology adoption in Uganda through either partial or full subsidy arrangements for the small holder farmers. For example, the Uganda Dairy Biogas Program implemented by Sistema.bio and Native partnership which had a strong subsidy of 64% cost-share for installing a biodigester covered by the partnership through its carbon program<sup>8</sup>. In addition, the development response to displacement impacts project (DRDIP) funded by the World Bank and implemented by Uganda's Office of the Prime Minister in the refugee settlements and refugee host districts<sup>9</sup>. The project covered 100% cost of installing a biodigester for the benefit of the potential end-users<sup>10</sup>.

<sup>1</sup> Issahaku, M., Derkyi, N. S. A., & Kemausuor, F. (2024). A systematic review of the design considerations for the operation and maintenance of small-scale biogas digesters. *Heliyon*, 10(1).

<sup>2</sup> Warnars, L. (2014). Bioslurry: a supreme fertilizer. Positive effects of bio-slurry on crops.

<sup>3</sup> <https://www.biogassolutions.co.ug/>

<sup>4</sup> [https://www.snv.org/assets/downloads/f/191310/e3fbe1d98f/20200526\\_-\\_abpp-4bf\\_factsheet.pdf](https://www.snv.org/assets/downloads/f/191310/e3fbe1d98f/20200526_-_abpp-4bf_factsheet.pdf)

<sup>5</sup> [https://www.snv.org/assets/downloads/f/191310/e3fbe1d98f/20200526\\_-\\_abpp-4bf\\_factsheet.pdf](https://www.snv.org/assets/downloads/f/191310/e3fbe1d98f/20200526_-_abpp-4bf_factsheet.pdf)

<sup>6</sup> Field reports from the biodigesters- Rural Environmental Sustainability Initiative Limited (RESI) & Adriani Agribusiness

<sup>7</sup> Over 30% of the appliances used in the biodigester constructions are imported into Uganda

<sup>8</sup> <https://sistema.bio/blog/sistema-bio-launches-its-carbon-program-in-uganda/>

<sup>9</sup> <https://opm.go.ug/drdip/>

<sup>10</sup> <https://documents1.worldbank.org/curated/en/512841532690959822/pdf/Uganda-DRDIP-Final-ESMF-July-24-2018.pdf>

According to the information obtained from some of the biodigester enterprises,<sup>11</sup> a small holder farmer requires between UGX 2.8 million to UGX 5.8 million to install a domestic biodigester, up from a range of between UGX 1.57 million and UGX 3 million depending on the size and type (either prefabricated or fixed dome) when the subsidy arrangement by Sistema.bio existed.

Amidst the current absence of subsidy programmes for biodigester installations for small holder farmers, the problem is compounded by the limited access to finance by both the potential biodigester end-users and the construction companies. Despite the availability of green financing and other agricultural credit facilities for small and medium enterprises (SMEs) for example by the World-bank funded Uganda Energy Credit Capitalization Company (UECCC), there is a general perception among the small holder farmers that the interest rates from the financial institutions are still high, ranging from 10% to 28% per annum.

National level engagements are ongoing involving the Ministry of Energy and Mineral Development and other key biodigester sub-sector stakeholders with a view of establishing the best modalities to unlock the existing credit facilities in financial institutions to support small-scale farmers access affordable interest rate loans for biodigester installations. This is still work in progress.

## Conclusion

The rising upfront costs of installing biodigesters in Uganda have the potential to distort the biodigester market evidenced by the drastic decline in the adoption of the technology. This undermines the multi-dimensional benefits of the biodigester technology: Biogas for clean cooking; biogas for lighting; bio-slurry as an organic fertilizer to boost soil health and crop yield; bio-slurry for animal feed; bio-slurry as an insect repellent.

The following recommendations for policy, planning and practice are critical in maintaining the value proposition of the biodigester technology that would make it more affordable by the majority small-holder farmers.

<sup>11</sup> Mostly those supported under the ABC project such as Rural Environmental Sustainability Initiative Limited (RESI), Bold Biogas Limited, Adriani Agribusiness Limited, Enercom, Biogas Gurus, among others.

## Recommendations

- The Government of Uganda through the Ministry of Energy and Mineral Development and other relevant ministries, departments and agencies (MDAs) need to deliberately establish a government-led development programme with full or partial subsidy particularly for small holder farmers to install domestic biodigesters and ensure their continued operation.
- Ministry of Energy and Mineral Development, Ministry of Agriculture and Mineral Development, Bank of Uganda, and other relevant ministries, departments and agencies (MDAs) need to establish a regulatory framework for revising interest rates on green loans implemented by the accredited commercial banks and micro-financial institutions to a level that small scale farmers can afford to install the biodigesters.
- Uganda Revenue Authority with support from the Ministry of Finance, Planning and Economic Development, Ministry of Trade, Industry and Cooperatives, and other key stakeholders need to conduct robust dissemination of the tax incentives (waivers) on the imported biodigester construction equipment and appliances. This will motivate the existing and upcoming biodigester construction companies to benefit from the tax waivers and boost the production of the biodigesters.
- Ministry of Trade, Industry and Cooperatives and other relevant ministries, departments and agencies (MDAs) need to create an enabling environment that fosters and accelerates domestic (local) manufacturing of the prefabricated biodigesters. There is need for increased investment in domestic (local) biodigester production (such as favourable tax regimes, common external tariffs, preferential pricing, public procurement, and land allocation in green fields). The local manufacturing hubs for prefabricated biodigesters have the potential to boost mass production and drastically reduce the prices.

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