



Biogas Digester

Description

The Biogas Digester is a single-stage, solar-supported system. It operates anaerobically to break down organic wastes into usable products. The products include methane gas, water, and organic fertilizer. This digester was developed using locally available materials like stones, wood, cement, iron rods, nails, PVC pipes, copper pipes, and their accessories. The digester has a manual stirrer to mix the influent and the inoculum for better degradability. A solar thermal heating system is installed in the digester, connected to a locally made heat exchanger for heating the digester to a thermophilic condition of 55°C. This disinfects the digestate for agricultural purposes since the digestate is nutrient rich. The biogas is converted into electricity using a combined heat and power (CHP) generator.

Benefits

- Offers an on-site solution for managing organic waste and generating energy for farm operations.
- Supports decentralized energy production by providing sustainable energy to local communities.

Challenges

- Unsuitable for the management of high-risk organic waste.
- Limited local availability of the prefabricated digester.
- Biogas production is hindered at low temperatures ($\leq 20^{\circ}\text{C}$)

Country Example: University of Cape Coast, Ghana



Manual excavation of the digester pit



Wood works to give the shape of the digester



Excavated pit showing the influent and effluent chambers





Solar thermal collector connected to the heat exchanger in the digester. Attached to the right is the solar water heater controller.

Knowledge Sharing Centres

Below are the contact persons for country specific questions. Please refer to them or the Coordinator from Hochschule Wismar, for details about the technologies that have been piloted or project research, training, and dissemination activities that are being planned in your region or country. The project runs until May 2025, with Knowledge Sharing Centres established to continue the work beyond that date. More details available on the website <https://www.divagri.org>

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This fact sheet serves as a general overview of the above bio-based technology (BBT). It is one of seven BBT factsheets. It describes one prototype of this technology that was developed prior to 2023. Adaptations of it have been made for the various country and local contexts. Please contact the country Knowledge Sharing Centre for more details. The EU-funded DIVAGRI project (2021-2025), 'Revenue diversification pathways in Africa through bio-based and circular agricultural innovations' seeks to provide African subsistence and smallholder farmers with tools to sustainably improve farm productivity, profitability and resilience through improved management of farming resources, output diversification and creation of high-value circular bioproducts. For more, visit [divagri.org](https://www.divagri.org)



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