
An Overview of improvised Kenpro Portable Biogas Plant (iKPBP) Design

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*Biogas is a renewable energy source produced through the anaerobic digestion of organic materials such as agricultural waste, food scraps, animal manure, and wastewater. It primarily consists of methane (CH₄) and carbon dioxide (CO₂), with trace amounts of other gases such as hydrogen sulfide and nitrogen. The anaerobic digestion process occurs in the absence of oxygen, where micro-organisms break down organic matter, releasing methane-rich gas as a byproduct. Biogas can be utilized as a fuel for cooking, heating, electricity generation, and even transportation. It offers numerous environmental benefits, including reducing greenhouse gas emissions, mitigating odors and groundwater contamination from organic waste, and promoting sustainable waste management practices. Owing to the benefits associated with biogas and the existing complexities in biogas systems' construction and installation processes, a simple design, namely **improvised Kenpro Portable Biogas Plant (iKPBP)** presents an opportunity for households and institutions to opt for a simple, portable, affordable and environmentally friendly biogas plant.*

Improvised Kenpro Portable Biogas Plant Design

Improvised Kenpro Portable Biogas Plant design follows floating drum design. The floating drum design is a common configuration used in portable biogas plants. In this design, the gas storage tank is typically situated above the digester tank and consists of a sealed drum or dome that floats on the surface of the digester's contents. As biogas is produced through anaerobic digestion, it displaces the liquid and causes the drum to rise. Conversely, when biogas is withdrawn or used, the drum descends back into the digester tank. This design ensures a constant pressure within the system, allowing for efficient collection and storage of biogas. Additionally, it provides a visual indicator of biogas production by the movement of the floating drum. The floating drum design is favored for its simplicity, ease of construction, and effectiveness in small-scale biogas systems, making it suitable for portable applications in various settings. Figure 1 shows a complete unit of kenpro improvised portable biogas plant.

The Components of improvised Kenpro Portable Biogas Plant

The Improvised Kenpro Portable Biogas Plant consists of two tanks: the digester and the gas storage tank. The digester houses the bacteria responsible for biogas and fertilizer production, while the gas storage tank stores the produced biogas. See Improvised Portable Biogas Plant below.

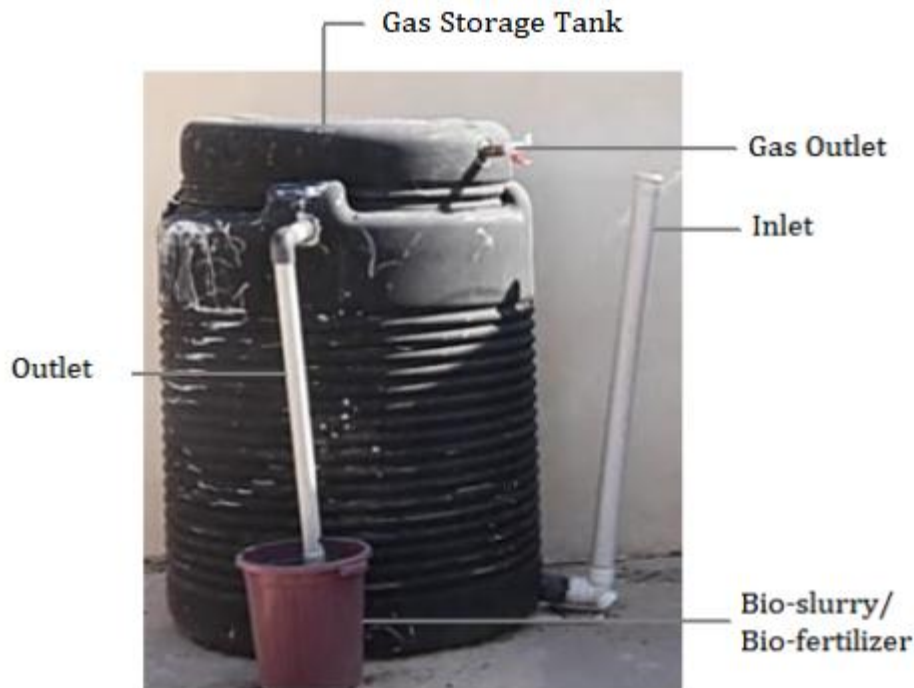


Fig. 1: Improved Portable Biogas Plant

Tips for Successful Operation of the improvised Kenpro Portable Biogas Plant

- Use cow manure initially for high bacterial activity.
- Monitor acidity levels and adjust with alkaline materials if necessary.
- Regularly add water to maintain optimal conditions for bacterial activity.
- Safety: improvised Kenpro Portable Biogas Plant operates at low pressure and therefore not prone to explosion.

Why Chose improvised Kenpro Portable Biogas Plant?

Affordability: The portable biogas plant is made from relatively cheap materials. This reduces the production cost, thus drastically reducing the installation costs and therefore making it affordable to consumers in rural and peri-urban areas in developing economies.

Portability: The biogas plant is light and can be moved to any convenient location as long as it is close to the kitchen area.

Ease of Installation: It is simple to set up the portable biogas system as the system is made up of parts that can be attached.

Recycle-ability: Improved Kenpro Portable Biogas Plant is made of recyclable materials. For instance, when PVC is recycled, the carbon footprint is drastically reduced as compared to the production with fresh materials.

Conclusion

Improvise Kenpro Portable Biogas Plant offers a quick solution to affordable clean cooking energy for households not only in Kenya but in the region. IKPBP as compared to other Biogas systems such as fixed dome biogas plant is cost effective, portable, quick to install and easy to apply. IKPBP is also recyclable and therefore environmentally friendly.

For more inquiries about Installation of improvised Kenpro Portable Biogas Plant (iKPBP), kindly contact [Kenpro Biogas Program Team](#)
