

# Insights into home biogas technology adoption dynamics through the lens of the diffusion of innovation theory in Uganda

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## **Abstract:**

Ensuring sustainable development and enhancing socioeconomic conditions hinge on clean energy accessibility. To effectively promote and expedite the adoption of biogas technology, providing current information on crucial elements is vital. Our study delved into biodigester adopter typologies and assessed socioeconomic influencers on small-scale biodigester uptake in homes of Mpigi in Uganda. Employing a cross-sectional research design, we integrated quantitative and qualitative methods by conducting household surveys and key informant interviews coupled with field observations. Utilizing SPSS version 23, descriptive statistics and regression analysis characterized household features and evaluated adoption factors, revealing innovators (17.8 %), early adopters (25.7 %), early majority (33.7 %), late majority (15.8 %), and laggards (6.9 %). Biogas use increased from 2009 to 2017, declining by 2020. Education, income, subsidies, and farm proximity were key adoption predictors. Expanding subsidy access is crucial to accelerating biogas technology use, considering significant socioeconomic aspects. Study results inform ongoing discussions on formulating distinct policies for biogas adoption across developing countries.

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