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"Reconcile land system changes
with planetary health"

Economic viability perceptions for adoption of black soldier fly farming in climate-smart organic waste management

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Abstract

The implementation of climate-smart innovations is critical because they help merge land changes with environmental wellness. Economic perception understanding plays a critical role for technological adoption scaling purposes. This research analyses how economic perceptions contribute to the implementation of Black Soldier Fly (BSF) farming for turning organic waste into animal feed and biofertilisers. Black Soldier Fly farming has strong potential to prevent climate change and sustain the food system but yet its adoption has been slow. A multi-stage sampling approach and cross-sectional survey methodology was used to gather data from 307 organic waste producers. Structural Equations Modelling and demographic analysis methods were used to carry out the analysis. The study findings revealed that 64 % of the respondents believed BSF farming demonstrated economic viability. Awareness of insect farming to manage organic waste was 65 % among males and 48 % among females. Higher education levels and attendance of training led to a more positive perception. Most training sessions were attended by the youths, 18–35 years. Respondents in the 26–45 age group showed the most willingness to adopt BSF technology respondents. Key enabling factors for adoption included financial incentives, access to equipment, and tailored training. The results demonstrate that economic viability serves as the main factor influencing the acceptance of BSF technology. Raising public understanding about the profitability and additional advantages of BSF technology leads to faster adoption rates that will support sustainable land practices and circular economic systems along with resilient agricultural operations. BSF farming represents an effective solution for both landfill waste diversion and resource management which helps agricultural innovation support planetary health goals.

Keywords: Black soldier fly, climate-smart technologies, economic feasibility, organic waste management, technology adoption

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