

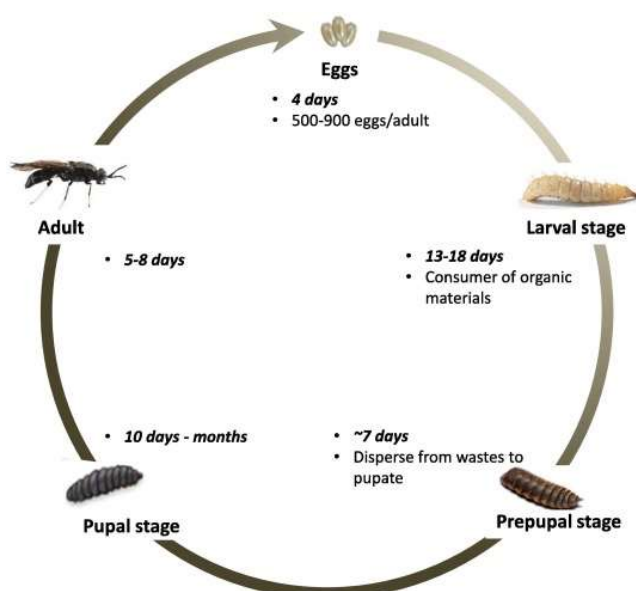
# BUGS Project

## Biomass Utilization by Insects for Green Solutions in Africa through Black Soldier Fly Technology

<b>Period</b>	12.2023 – 10.2026
<b>Countries</b>	Ethiopia, Ivory Coast, and Uganda
<b>Project partners</b>	Africa Circular, Trinomics, Eclose, and EAWAG. The project is co-funded by the Climate and Clean Air Coalition (CCAC) and the PREVENT Waste Alliance.

### Black Soldier Fly Technology

The Black Soldier Fly (BSF), *Hermetia illucens*, is recognized for its ability to convert organic waste into protein- and fat-rich biomass for animal and fish feed. The fly larvae are fed with organic waste, reducing the waste amount by 50–80% (wet weight) to a residue. Larvae can be harvested after about 14 days with a waste-to-biomass conversion rate of up to 20% (on a total solid basis). The larvae can be processed and used as a fishmeal substitute in animal feed, while the remaining residue can be composted and used to produce organic fertilizer.



### The project

PREVENT Waste Alliance members have initiated a project to promote the Black Soldier Fly (BSF) technology in Ethiopia, the Ivory Coast and Uganda.

The project idea emerged from the PREVENT Organic Waste Working Group, whose members co-developed a project proposal.

Implemented by the Africa Circular, Trinomics, Eclose, and EAWAG, the project is co-funded by the Climate and Clean Air Coalition (CCAC) and PREVENT. It develops a **guide for BSF operators and creates a methodology to assess the feasibility of BSF initiatives** to be piloted in the target countries. It also seeks to capture best practices and foster collaboration among stakeholders, mainstreaming BSF farming into waste management policies and climate strategies.

**Workshops** held in early 2024 in each country brought together stakeholders to discuss opportunities, explore existing policies, and address technical gaps. The sessions also explored how BSF technology could complement existing composting initiatives, access, and manage waste from food processing, and design sustainable business models. The multi-year project aims to lay the **groundwork for future BSF initiatives** and create favourable economic and institutional conditions for long-term success.

### Requirements for a successful BSF implementation

To establish a successful Black Soldier Fly (BSF) project, several prerequisites must be met.

- BSF larvae require a warm, stable climate and thrive in temperatures between 24°C and 30°C.
- Consistent humidity is also crucial, with optimal levels above 60%.
- Cooperative actors enabling access to a steady, long-term supply of homogenous food- and kitchen waste is essential for larvae feeding.
- There must be a market for the larvae and by-products, such as animal feed or compost.

### Challenges and Obstacles

A lack of funding, limited knowledge on BSF technology, poor infrastructure, insufficient stakeholder coordination, and gaps in policy frameworks commonly complicate the scaling of BSF projects. Overcoming these obstacles requires targeted awareness and education, infrastructure investment, and supportive policies to ensure success.

### Climate Impacts

If mismanaged, traditional waste management methods, such as landfilling and open-air composting, emit methane and CO<sub>2</sub>, contributing to climate change. BSF larvae efficiently convert organic waste into usable biomass. Case studies indicate that this can significantly reduce GHG emissions compared to composting and depending on energy consumption and sources and other factors and therefore, combat global warming. Additionally, the larvae can replace resource-intensive animal feed like fishmeal, lowering the environmental footprint of livestock farming. BSF technology thus supports low-carbon waste management and sustainable food production.

### Circular Economy Impacts

The Black Soldier Fly (BSF) technology supports a circular economy by turning organic waste into valuable resources and thereby supporting a functional organic waste management system. This process closes the loop on organic waste, reducing environmental impact, and promoting sustainable resource use. By repurposing waste into productive inputs, BSF technology aligns with circular economy principles of resource efficiency and waste minimization.

### **Achievements**

- Assisting governments in developing BSF project proposals.
- Identification of priority areas for BSF implementation providing the most suitable conditions in the three partner countries.
- Face-to-face training workshops for 240 BSF operators on applying the technology at local level.
- Case Study with project's lessons learned.
- Three capacity building workshops in target communities.
- Assessment and planning toolkit to ensure replicability in additional countries

## **PREVENT Waste Alliance**

The PREVENT Waste Alliance serves as an international 'think and do tank' for circular economy practitioners. As a platform for knowledge exchange and international cooperation, it brings together organisations from the private sector, academia, civil society and public institutions. PREVENT's mission is to advance the circular economy in low- and middle-income countries by minimising waste, eliminating pollutants, and maximising the reuse of resources in the economy worldwide.

This project was selected in a call for innovative and scalable solutions to build a circular economy.

The PREVENT Waste Alliance was launched in 2019 by the German Federal Ministry for Economic Cooperation and Development.



### **Imprint**

#### **Published by**

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH  
PREVENT Waste Alliance  
Friedrich-Ebert-Allee 32 + 36  
53113 Bonn  
Germany

T +49 61 96 79-0  
F +49 61 96 79-11 15

E [info@giz.de](mailto:info@giz.de)  
[contact@prevent-waste.net](mailto:contact@prevent-waste.net) | [www.giz.de](http://www.giz.de)

June 2025

Credits: Figure © Surendra et al. (2020)

#### **On behalf of**

German Federal Ministry for Economic Cooperation and Development (BMZ)  
Division 121 Water and Circular Economy  
Bonn, Germany

This project is funded by the PREVENT Waste Alliance, an initiative of the German Federal Government.

More information: [www.prevent-waste.net/](http://www.prevent-waste.net/)