# BUHERA DISTRICT, ZIMBABWE

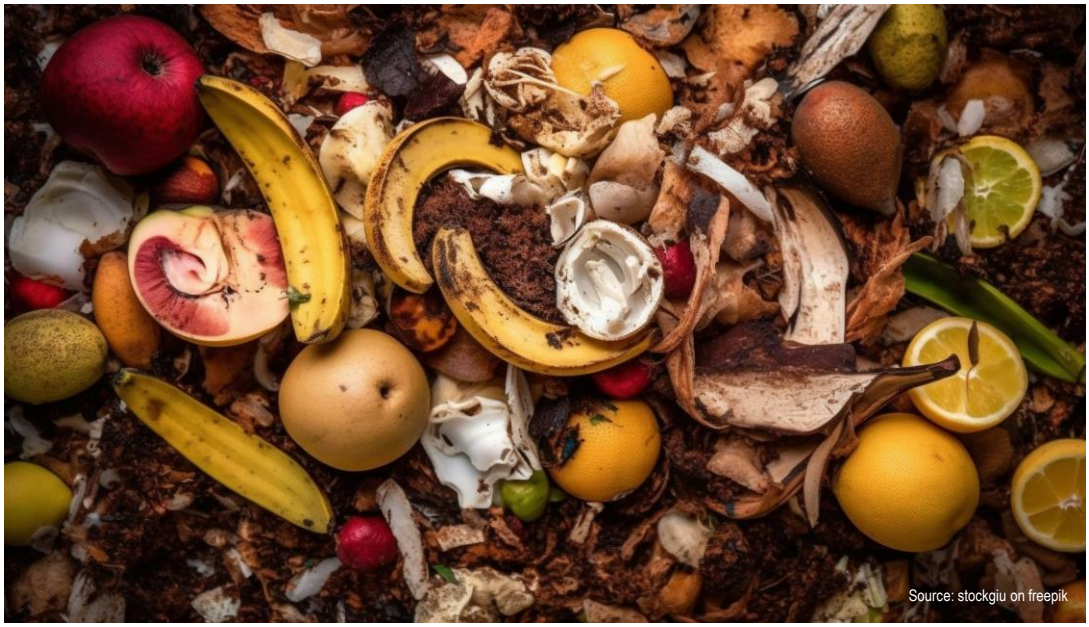
POPULATION
245.878
Inhabitants (2019)

## Organic Waste Treatment: Black Soldier Fly Technology

Treating organic waste with black soldier flies (Hermetia illucens) is an innovative and sustainable approach to waste management. Black soldier flies are nature's efficient decomposers and have been increasingly utilized in recent years to manage organic waste effectively. The process starts with collecting organic waste and placing it in designated containers, after removal of contaminants and shredding it. Black soldier fly larvae are introduced to the prepared organic waste. As the larvae feed on the organic waste, they break it down into simpler compounds, using their digestive enzymes. The digested waste material, known as "frass," is rich in nutrients and can be used as an organic fertilizer or soil conditioner. It's an excellent resource for agriculture and horticulture. Black soldier fly larvae are unique in that they instinctively crawl out of the waste material when they reach a certain stage of development. This self-harvesting feature makes it easy to separate the mature larvae from the processed waste. A portion of the larvae serves to replenish the colony, while the remainder is used as high-quality protein feed for poultry and fish.

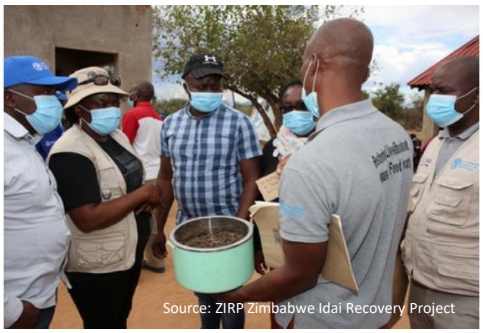
The UN in partnership with the World Bank has implemented the Zimbabwe Idai Recovery Project (ZIRP) to address the early and medium-term resilient disaster recovery needs of Cyclone Idai-affected communities in Zimbabwe. One of the project activities is piloting the production of Black Soldier Fly (BSF) in Buhera district as a source of protein for livestock feed, targeting 500 selected beneficiaries. Even if not the main objective, the project will highly contribute to treatment of organic waste as farmers will feed the larvae with their organic household waste. As the treatment approach is relatively new, the project also included a comprehensive capacity building and training of farmers on BSF to ensure viable production and adoption of BSF to reduce feed cost and therefore improve livestock production and productivity. Trainings focused on setting up colonies, larva management, feed formulation and BSF feeding including infrastructure development. A total of 22 sites in Buhera have already been selected as demonstration sites and more than 500 farmers have been registered as cluster farmers around the 22 sites.

The farmers have built greenhouses, tanks and driers, to engage in black soldier fly farming. They were using household kitchen waste, sadza and manure to attract wild BSF to produce maggots. The maggots resulted were then dried, grounded and mixed with soya meal/sorghum/maize and salt and fed to chicken. The resulted byproducts would be used as fertilizer to increase crop productivity. Some farmers expect to produce 2 tonnes of BSF annually for feeding their poultry.


Source: stockgiu on freepik

## IMPACTS TO ACHIEVE SDG 11.6.1

- **Reduced Landfill Waste:** By diverting organic waste from landfills, this method helps reduce the production of harmful greenhouse gases like methane, which are associated with conventional landfill disposal.
- **Nutrient-Rich Byproduct:** The resulting frass is an excellent organic fertilizer, offering a sustainable way to enrich soil and support plant growth.
- **Protein Rich Source:** The nutritional composition of black soldier fly larvae makes them a sustainable and environmentally friendly alternative to traditional protein sources in animal feed.
- **Low Environmental Impact:** Black soldier fly larvae are low-maintenance and environmentally friendly, as they do not pose risks associated with pests or disease vectors.
- **High Efficiency:** They have a rapid reproductive cycle, allowing for the continuous processing of organic waste.
- **Versatility:** Black soldier fly larvae can consume a wide variety of organic materials, making them adaptable to different waste streams.


Source: ZIRP Zimbabwe Idai Recovery Project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## INSTITUTIONAL SUSTAINABILITY

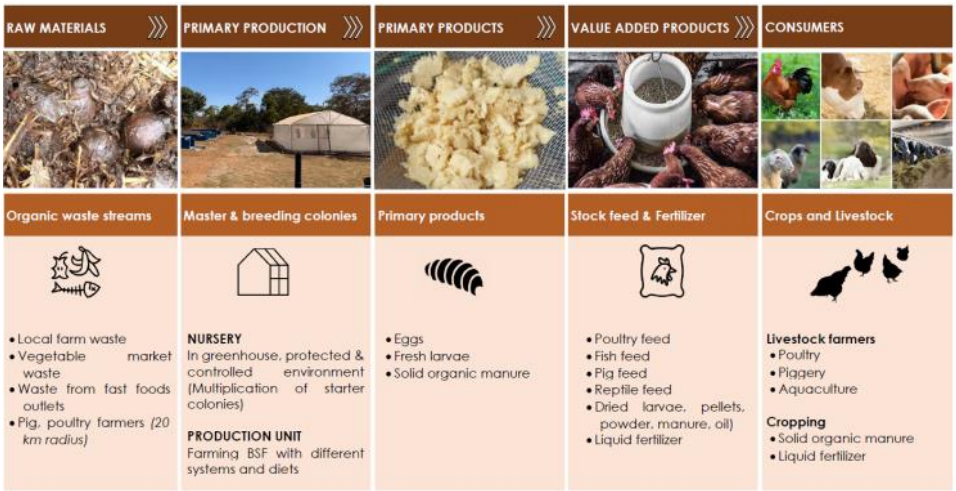
The project of Black Soldier Fly Production was implemented as part of Food Security & Livelihood under the ZIRP, led by FAO in partnership with LEAD, targeting 500 selected beneficiaries. In April 2022, the project formed 22 clusters of registered beneficiaries, with farmers grouped around producers, averaging 23 farmers per producer. Clustering aimed to facilitate farmer learning about BSF at production sites within 3km of their homes. This led to dispersed production sites serving farmers' needs, doubling as demonstration areas. The project trained farmers at three levels: individual farmer training during home visits, practical group training with producers and farmers together, and mixed group training allowing for experience-sharing and learning of best practices. Experiential group sessions were particularly favored by farmers, enhancing practical learning and fostering collaboration. These approaches aimed to improve BSF fly production effectively.

## PLANNING & MONITORING

The project was not integrated in the MSWM masterplan, and the initiative identified the sites for facility establishment based on the cyclone Idai-affected communities in Zimbabwe. The LEAD project conducted regular monitoring of environmental and social (E&S) compliance: fortnightly by the LEAD Project Coordinator, twice a fortnight by the Field Officer, and monthly by FAO. UNOPS and government officials, including the Civil Protection Department and Ministry of Finance, also participated in monitoring. LEAD ensured adherence to World Bank standards and reported any incidents to FAO within 12 hours. Farmers could raise grievances through a toll-free number. The project used frameworks like the sand abstraction framework and collaborated with EMA village committees to monitor sand and stone extraction. Monitoring and evaluation exercises were conducted in collaboration with Agritex, DVS, and the DDC's office to detect deviations from agreed extraction parameters. Reports were shared with district stakeholders to address issues and implement mitigation measures as per government directives.

## APPROPRIATE TECHNOLOGY

- Black soldier fly technology was adopted, as a source of protein for livestock feed, targeting 500 selected beneficiaries.
- 3 kgs of BSF larvae every three weeks.
- Cost of production per ton for BSF is 50%-62% cheaper than conventional soya bean meal
- The composting process of BSF organic fertiliser takes five weeks compared to the 8–24 weeks for conventional organic fertilisers.
- In test projects in Kenya, plots treated with frass fertiliser had 14% higher maize grain yields than plots treated with existing commercial organic fertiliser.




Source: ZIRP Zimbabwe Idai Recovery Project

## FINANCIAL SUSTAINABILITY

The initiative was funded through the Zimbabwe Idai Reconstruction Project (ZIRP). Financial sustainability for long-term implementation is not disclosed.

## STAKEHOLDER INVOLVEMENT / INCLUSION OF INFORMAL WASTE SECTOR

The main actors/stakeholders in the projects are the UN, World Bank, Zimbabwe Buhera City and the farmers in Buhera. The main target of the initiative is farmers. During the project, 22 sites have been designated as farmer field schools or demonstration sites, with over 500 farmers registered as cluster farmers around these sites, in Buhera district. This initiative aims to empower farmers with the knowledge and skills needed to effectively incorporate BSF into their farming practices, thereby improving agricultural sustainability and livelihoods in the region.

## SOURCES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UN-HABITAT

P.O. Box 30030, Nairobi 00100, Kenya
T: +254-20-76263120
E:unhabitat-info@un.org

**Andre Dzikus,**
Chief Urban Basic Services Section

accp@un.org
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