



**USAID**  
FROM THE AMERICAN PEOPLE



Photo credit: Regen Organics

# INSECT FARMING FOR MULTIPLE GLOBAL DEVELOPMENT OUTCOMES

Farming insects for animal feed and human use benefits local economies, strengthens food security, mitigates greenhouse gas emissions, and advances community resilience.

Insect farming exemplifies a circular model livestock system. Many commercial and small-scale insect operations raise insects entirely on organic waste—which is diverted from producing methane in landfills—with minimal inputs of water and other raw materials. In return, insect farming generates high-protein and nutrient-dense feed for traditional domestic livestock and aquaculture, as well as by-products such as organic fertilizer, biofuels, waxes, resins, and dyes. Small-scale insect farming requires little area and time, making it ideal for women, youth, and marginalized groups who have limited access to space and resources. Large-scale operations can be built vertically, which gives farmers the flexibility to live in urban or peri-urban areas and/or close to food waste producers to feed the insects.

## FUTURE GROWTH FOR DEVELOPMENT

Improved technology is making it easier to scale up insect farming, providing new opportunities for economic growth and development. In 2013, the Food and Agriculture Organization released a seminal report, *Edible insects: Future prospects for food and feed security*,<sup>1</sup> which laid the technical groundwork for global expansion and ‘mainstreaming’ of insect farming. According to [Dealroom.co](https://dealroom.co), a global data platform on startups and high-growth companies, over 400 businesses are producing insects for feed or food worldwide. With an annual growth rate of 24 percent, the Barclays Investment Bank predicts the global insect production market could be worth up to \$8 billion by 2030,<sup>2</sup> equivalent to SpaceX revenue forecasts for 2023.<sup>3</sup>

<sup>1</sup> FAO 2013. *Edible insects: Future prospects for food and feed security*.

<sup>2</sup> Barclays 2019. *Sustainable & Thematic Investing: Insect protein: Bitten by the bug*.

<sup>3</sup> Peterson, B., and Weinberg, C., 2023. *SpaceX Forecasts Doubling of Revenue to \$8 Billion*. The Information.

## BENEFITS OF INSECT FARMING

### Environmental

- Requires minimum inputs of water and raw materials compared to soy and other livestock production (see Figure 1).
- **Mitigates land and marine degradation** by reducing dependency on intensive land-use agriculture and overharvesting of marine stock for fishmeal.
- Utilizes food by-products and waste as an input which keeps **waste out of landfills** and **reduces methane emissions**.

### Job and Livelihoods

- Creates **economic opportunities** for women, youth, individuals with disabilities, and other marginalized groups in urban and rural areas.
- Strengthens **local feed production** and consistent supply for national and regional markets.

### Nutrition and Health

- Provides a sustainable and **nutritious high-protein source** for domestic animal feed and human diets.
- **Reduces food waste and pollution.**
- Produces organic fertilizer, which improves **soil health and crop production.**

### Economic Development

- Enjoys large potential for **global economic growth** as technology and husbandry practices develop.
- Opportunities to strengthen small holder farmers **economic resilience** and **local supply chains** (i.e., fertilizer, feed, waste management).

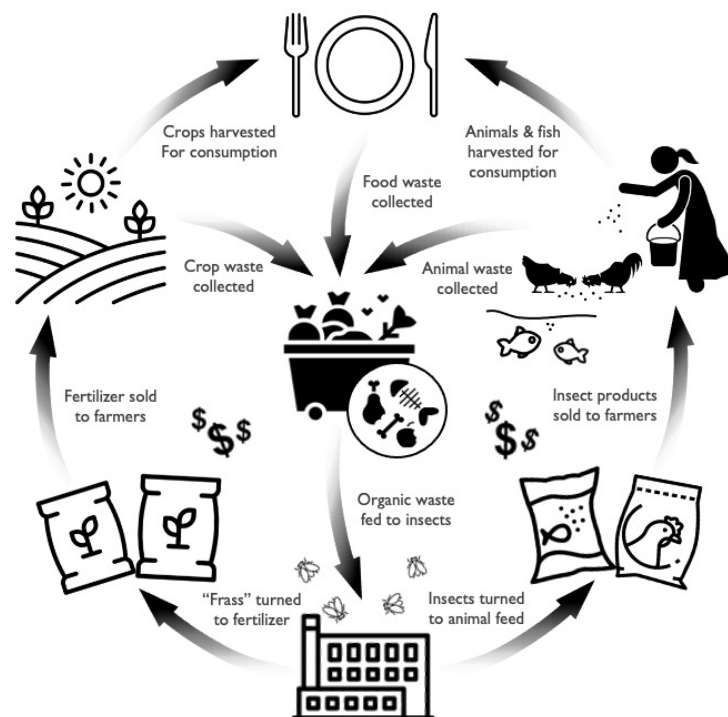


Figure 1. Climate-smart, circular economy conceptual model for insect farming. Designed by K. Shokirov

## NEEDS AND OPPORTUNITIES

The global development community is well positioned to help expand insect farming and its numerous benefits. Opportunities exist to help improve regulatory frameworks and biosafety procedures, build capacity of small- and large-scale farms, and design integrated market systems and targeted messaging strategies. USAID supports insect farming through knowledge sharing and networking across the global insect farming community. USAID also assists research partnerships and field projects, such as [small-scale pilot farms](#) in Uganda that created this practical [training manual](#) for rearing black soldier flies. Existing funding opportunities at USAID include [Development Innovation Ventures](#), [Laser PULSE Partnerships](#), and [Unsolicited Solutions for Locally Led Development](#).