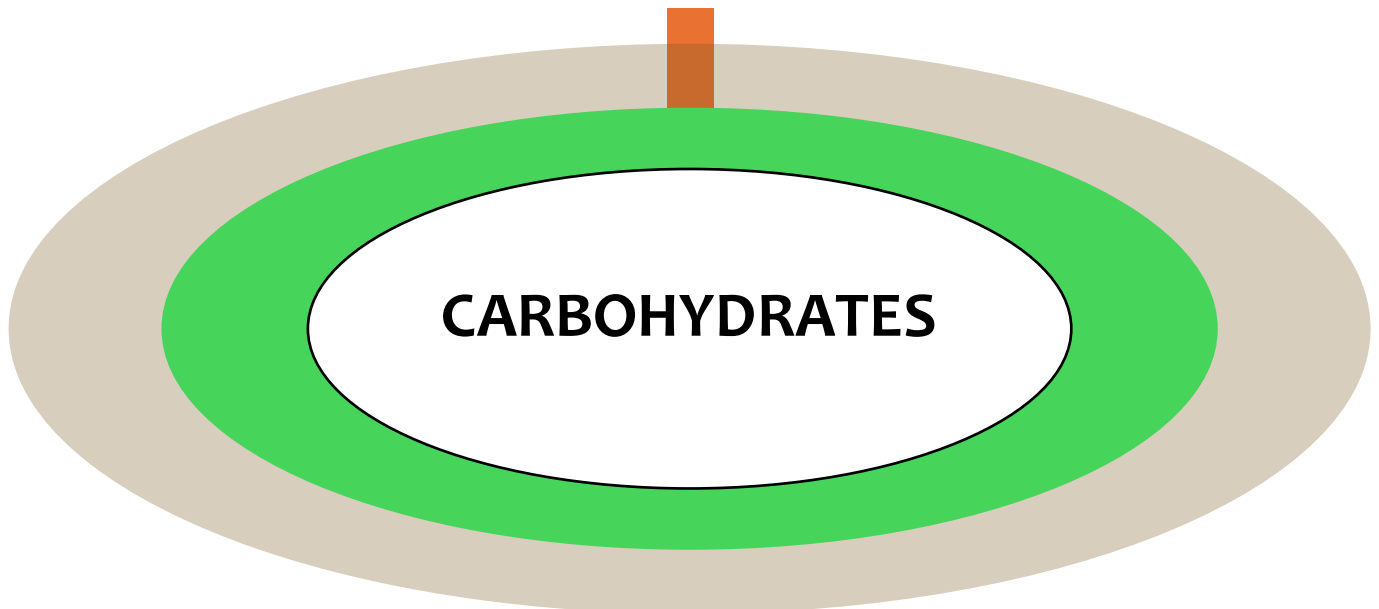


BLACK SOLDIER AFRICA Pty.Ltd:

Protein for the masses



P

roblem Statement

Numerous problems – One solution

High animal feed prices, exacerbated by climate change, pose a significant threat to global food security.

- **The main driver of raising livestock is feed, which may account for 60%-70% of total livestock production costs and productivity.**

Most farmers are unable to break even or make high returns and sufficient income because of high feed prices across the globe.

The rising costs of fertilizers, pesticides, and seeds, along with higher transportation costs due to fuel price hikes and logistical challenges, drive up feed prices. Most farmers who cannot afford the unprecedented rise in feed prices leave farming, which in turn exacerbates food security for the masses and marginalized.

The global population increase and dietary shifts towards higher meat consumption intensify demand, while limited arable land and water resources constrain supply.

- **Today, about 76% of soy production is used as low-cost, quality protein for animal feed for meat and dairy production, 20% is consumed as edible oils and human food products**
- **For instance, the global soybean meal market, a major animal feed component, is projected to reach \$74.3 billion by 2028, growing at a CAGR of 4.5% from 2021 to 2028, indicating a significant strain on supply chains.**

Climate change further exacerbates this issue through extreme weather events, such as droughts and floods, which disrupt crop production and reduce yields. Droughts and temperature fluctuations impact key feed crops like soybeans and corn, which are essential for livestock feed. Soil degradation, caused by erosion, nutrient loss, and salinization due to rising sea levels, further reduces agricultural productivity. Water scarcity, driven by changing precipitation patterns and melting glaciers, reduces water availability for irrigation, critical for feed crop cultivation.



Food waste

Food waste significantly impacts climate change and poses numerous problems.

- **While an estimated 735 million people go hungry globally, food loss and waste generate 8 to 10 percent of GHGs and is a methane hotspot. The decomposition of food waste in landfills produces methane, a potent greenhouse gas that is 25 times more effective at trapping heat in the atmosphere than carbon dioxide.**

The results of the study suggest that roughly one-third of food produced for human consumption is lost or wasted globally, which amounts to about 1.3 billion tons per year.



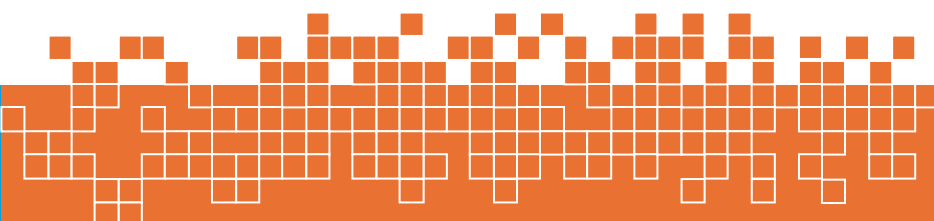
Proposed Solution

AFRICAN BLACK SOLDIER FLY Pty.Ltd Protein for the masses

Business Type: Sustainable Agriculture and Waste Management

Location: Johannesburg, South Africa

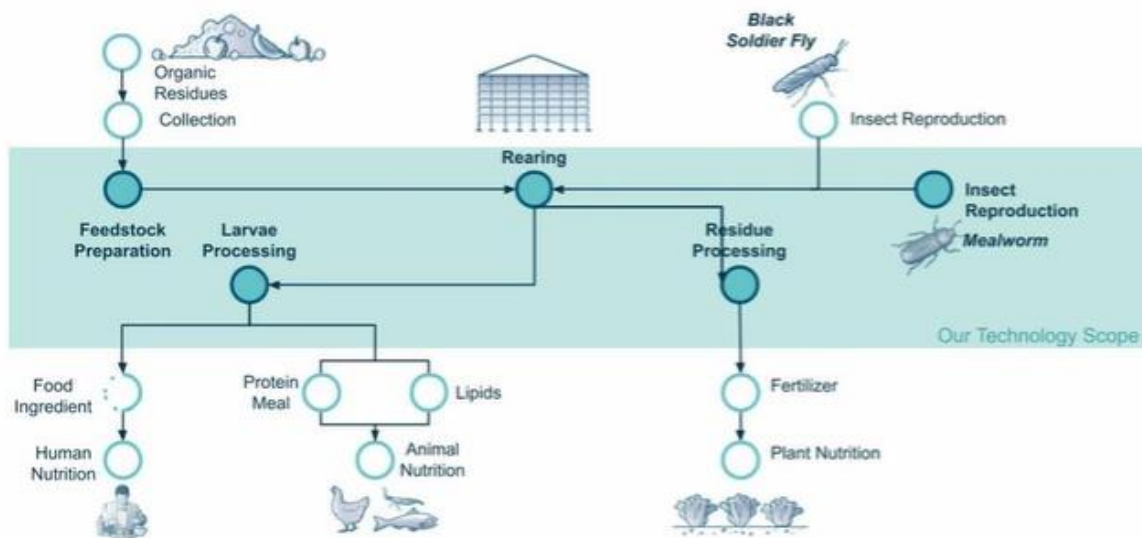
CEO: Sebudisi Mafabatho



Mission Statement: To revolutionize waste management and animal feed production through sustainable, innovative, and eco-friendly solutions using Black Soldier Fly technology.

Vision: To become a global leader in sustainable protein production and organic waste recycling, contributing to a circular economy and promoting environmental sustainability.

Business Description: African Black Soldier Fly Ltd. is a pioneering enterprise in the field of sustainable agriculture and waste management, specializing in the cultivation of Black Soldier Fly (BSF) larvae. Our business model focuses on transforming organic waste into high-value protein feed for livestock, aquaculture, and pet food industries, while also producing nutrient-rich organic compost for agriculture.



Pic:1 BSF Production Model

Key Products and Services:

1. BSF Larvae Protein Feed:

- **Description:** High-protein, nutrient-rich larvae meal for livestock and aquaculture.
- **Benefits:** Sustainable alternative to traditional feed ingredients like soybean and fishmeal.



2. Organic Compost (Frass):

- **Description:** Organic fertilizer produced from the by-products of BSF larvae.
- **Benefits:** Enhances soil fertility and promotes sustainable agricultural practices.

3. BSF Oil:

- **Description:** The larvae of these flies are rich in fats and proteins, which can be processed to extract oil. The oil is usually obtained through mechanical pressing or solvent extraction methods.
- **Benefits:** The high lauric acid content in BSF oil gives it strong antimicrobial properties, which can help improve gut health in animals by reducing harmful bacteria and promoting a healthier digestive system.



4. Waste Management Services:

- **Description:** Collection and recycling of organic waste from food industries, farms, and municipalities.
- **Benefits:** Reduces landfill waste and greenhouse gas emissions.

Social Value, Inclusivity and Environmental Impact:

Black Soldier Fly (BSF) farming presents numerous benefits that address several global challenges. One of the primary advantages is sustainable waste management. BSF larvae can consume and convert organic waste, including food scraps, manure, and agricultural residues, into valuable protein and compost.

This process significantly reduces the volume of waste sent to landfills, thereby decreasing methane emissions and overall waste management costs. By diverting organic waste from landfills, BSF farming reduces greenhouse gas emissions, contributing to climate change mitigation.

Additionally, BSF larvae provide a high-quality, nutrient-dense alternative protein source for animal feed, which can replace traditional protein sources like soybean and fishmeal, reducing the environmental impact of feed production. BSF farming is also highly resource-efficient, requiring less land, water, and energy compared to traditional protein sources, thus conserving these valuable resources.

How Black Soldier Fly (BSF) Farming Relates to and Solves the Sustainable Development Goals (SDGs)

- 1. SDG 1: No Poverty**
 - **Economic Opportunities:** BSF farming creates income-generating opportunities with various diverse income streams and products, thus reducing poverty.
- 2. SDG 2: Zero Hunger**
 - **Food Security:** By providing an affordable and sustainable protein for animal feed, BSF farming supports livestock and aquaculture production, enhancing food availability and affordability, thereby contributing to the eradication of hunger.
- 3. SDG 3: Good Health and Well-being**
 - **Nutritious Feed:** The high-quality, nutrient-dense feed produced from BSF larvae improves the health and productivity of livestock, leading to better quality animal products for human consumption, thereby promoting good health and well-being.
 - **Empowerment:** BSF farming can empower women by providing them
- 4. SDG 5: Gender Equality**
 - with income-generating opportunities and involving them in sustainable agricultural practices, thereby promoting gender equality and economic independence.
- 5. SDG 6: Clean Water and Sanitation**

- **Resource Efficiency:** BSF farming requires significantly less water compared to traditional protein production methods, thereby conserving water resources and contributing to better water management and sanitation practices.
6. **SDG 7: Affordable and Clean Energy**
 - **Energy Conservation:** By reducing the need for energy-intensive feed production processes, BSF farming contributes to lower energy consumption and supports the development of more sustainable energy practices in agriculture.
 7. **SDG 8: Decent Work and Economic Growth**
 - **Job Creation:** The establishment and operation of BSF farms create jobs in farming, processing, and distribution, thereby contributing to decent work opportunities and stimulating economic growth.
 8. **SDG 9: Industry, Innovation, and Infrastructure**
 - **Innovation:** BSF farming promotes innovation in waste management and sustainable agriculture practices, supporting the development of more resilient and sustainable agricultural infrastructure.



9. **SDG 10: Reduced Inequalities**
 - **Inclusive Growth:** By providing economic opportunities in rural and underdeveloped areas, BSF farming helps reduce economic inequalities and supports inclusive growth.
10. **SDG 11: Sustainable Cities and Communities**
 - **Waste Management:** BSF farming can be implemented in urban and peri-urban areas to manage organic waste effectively, contributing to cleaner and more sustainable cities and communities.





11. **SDG 12: Responsible Consumption and Production**

- **Waste Reduction:** By converting organic waste into valuable products, BSF farming promotes responsible consumption and production patterns, reducing food waste and promoting a circular economy.

12. **SDG 13: Climate Action**

- **Emission Reduction:** BSF farming reduces greenhouse gas emissions by diverting organic waste from landfills and producing protein with a lower carbon footprint compared to traditional sources, thereby contributing to climate action.

13. **SDG 14: Life Below Water**

- **Sustainable Aquaculture:** By providing an alternative protein source for aquaculture, BSF farming reduces the pressure on wild fish stocks and supports the sustainability of marine ecosystems.

14. **SDG 15: Life on Land**

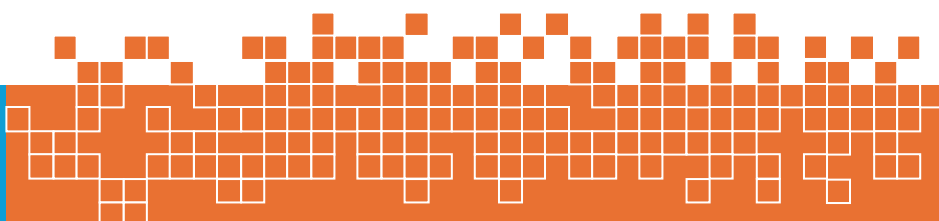
- **Biodiversity Conservation:** By reducing the need for land-intensive crops like soybeans and providing a sustainable protein alternative, BSF farming helps conserve biodiversity and promotes sustainable land use practices.

15. **SDG 17: Partnerships for the Goals**

- **Collaboration:** BSF farming encourages partnerships between governments, businesses, educational institutions, and communities to promote sustainable agricultural practices and achieve the SDGs collectively.

Capitalization Potential in the International Market.

Target Markets:



<i>Description</i>	Estimate
<i>Livestock and poultry farms</i>	Living in the world today are 30 billion chickens, 1 billion cows and almost 800 million pigs. While the dawn of agriculture was 8 000 to 10 000 years ago, only in the past century or so has humankind's relationship to farming and farm animals shifted dramatically.
<i>Aquaculture operations</i>	The 2024 edition of The State of World Fisheries and Aquaculture (SOFIA) reports that global fisheries and aquaculture production in 2022 surged to 223.2 million tonnes, a 4.4 percent increase from the year 2020. This production comprised 185.4 million tonnes of aquatic animals and 37.8 million tonnes of algae.
<i>Pet food manufacturers</i>	Europe and North America were the front runners in global pet food production in 2023 - both regions produced about 11 million metric tons in that year. Latin America ranked in third place, with a production volume of approximately 8.67 million metric tons.
<i>Agricultural sector for organic fertilizers</i>	The global Organic Fertilizers Market size was valued at USD 11.87 billion in 2022 and is projected to reach USD 27.48 billion by 2030, growing at a CAGR of 11.31% from 2023 to 2030
<i>Food processing industries and municipalities for waste management services</i>	While an estimated 735 million people go hungry globally, food loss and waste generate 8 to 10 percent of GHGs and is a methane hotspot.

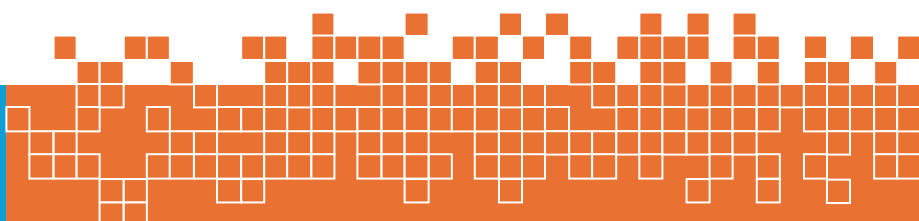
Key Customers:

Large-scale livestock and poultry producers

Aquaculture farms

Pet food companies

Organic farmers

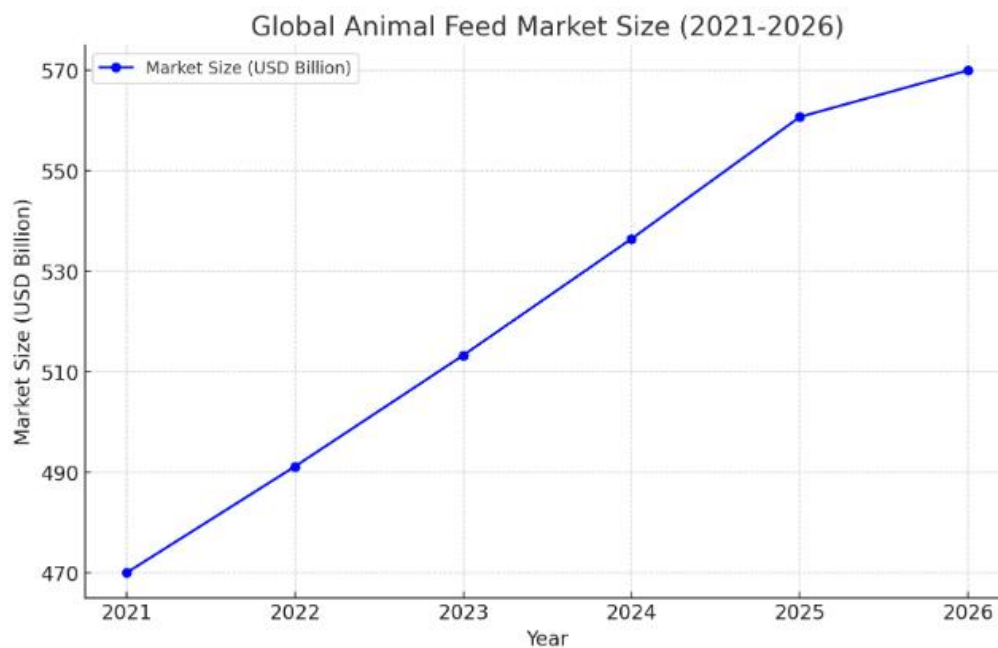


C urrent market and competitive products

Global Demand for Animal Feed

The global demand for animal feed is substantial and continues to grow, driven by increasing meat consumption, rising urbanization, and expanding middle-class populations. Key trends and statistics include:

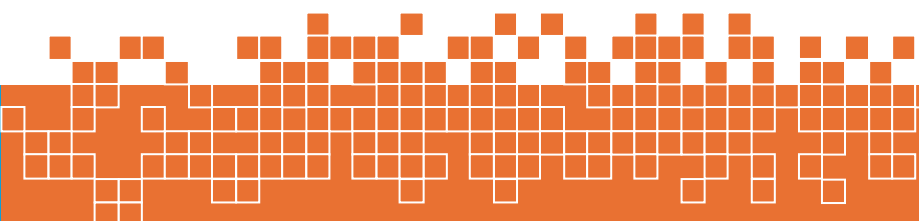
Global Market Size: The global animal feed market was valued at approximately USD 470 billion in 2021 and is projected to reach around USD 570 billion by 2026, growing at a CAGR of 4.5% during the forecast period.



The major exporters of soybean are the United States, Brazil, and Argentina. For fishmeal, the leading exporters are Peru, Chile, and Denmark. These countries dominate their respective markets due to their established agricultural and fishing industries, favourable climates, and technological advancements.

Sector Breakdown: The poultry sector is the largest consumer of animal feed globally, followed by the swine, ruminant, aquaculture, and pet food sectors

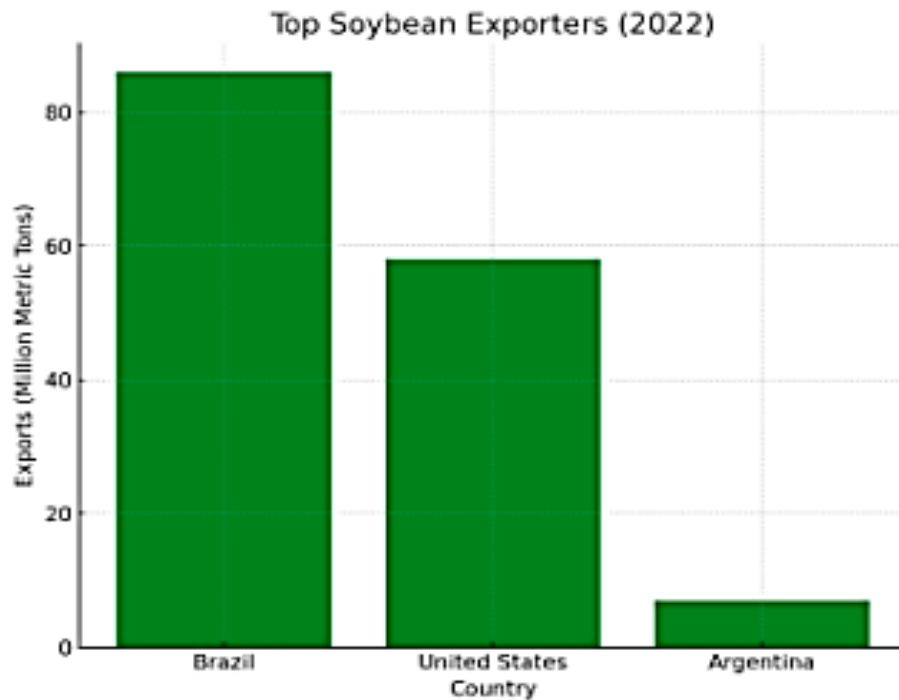
Top Exporters of Soybean and Fishmeal Globally



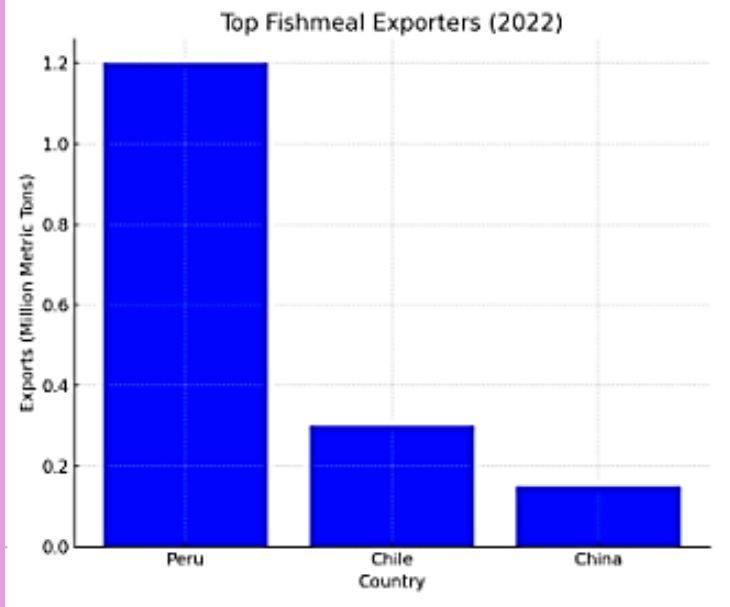


Soybean

The global soybean market is dominated by a few key players, with the largest exporters being: The global market for protein feeds is dominated by traditional sources like soybean and fishmeal. The soybean market is enormous, with the global soybean meal market projected to reach around \$74.3 billion by 2028, growing at a CAGR of 4.5% from 2021 to 2028. Fishmeal, on the other hand, has a market size expected to reach approximately \$10.3 billion by 2028, growing at a CAGR of around 7.1% from 2021 to 2028.

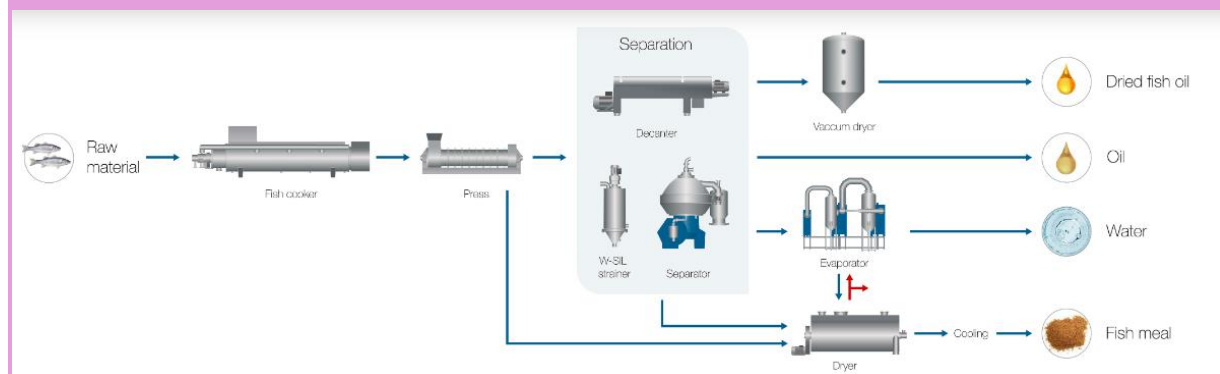


- Brazil:**
 - Brazil is the world's largest exporter of soybeans. In 2022, Brazil exported approximately 86 million metric tons of soybeans, accounting for about 49% of global soybean exports. The country's extensive agricultural land and favourable climate conditions make it a leading producer and exporter of soybeans.
- United States:**
 - The United States is the second-largest exporter of soybeans, exporting around 58 million metric tons in 2022. The U.S. exports about 37% of its soybean production, primarily to China, the European Union, and Mexico.
- Argentina:**
 - Argentina is another major player in the global soybean market, exporting approximately 7 million metric tons in 2022. The country's soybean industry is well-developed, and it is also a significant exporter of soybean meal and oil.



Fishmeal

Fishmeal exports are concentrated in a few key countries, primarily driven by their access to abundant marine resources:



1. Peru:

- Peru is the largest exporter of fishmeal globally. The country is renowned for its rich marine biodiversity, particularly anchovies, which are the primary raw material for fishmeal. Peru exported about 1.2 million metric tons of fishmeal in 2022, accounting for nearly 28% of global exports.

2. Chile:

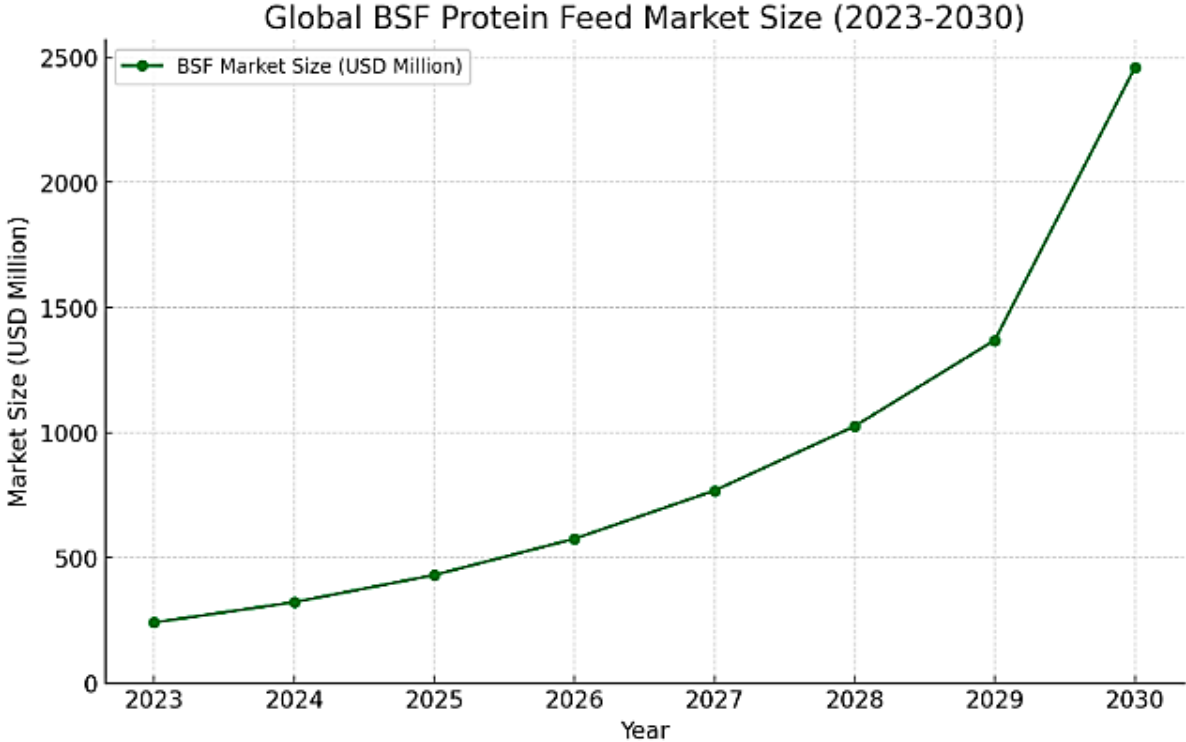
- Chile is the second-largest exporter of fishmeal, with exports of around 300,000 metric tons in 2022. The country's extensive coastline and robust fishing industry contribute to its significant role in the fishmeal market.
- China is not only a significant producer but also a major exporter of fishmeal. The country exported approximately 150,000 metric tons in 2022. China's

fishmeal industry is driven by both domestic aquaculture demand and export opportunities.

The rise and future of BSF

BSF market size and potential

In comparison, the Black Soldier Fly (BSF) protein feed market is much smaller but growing rapidly. The global BSF market was valued at \$242 million in 2023 and is projected to reach about \$2.46 billion by 2030, with a CAGR of 33.5% from 2024 to 2030.



This indicates that while BSF protein feed currently holds a small percentage of the market compared to soybean and fishmeal, its growth rate is significantly higher.

BSF Market and potential

The market share for BSF protein feed is still emerging but is expected to capture a larger portion of the market as demand for sustainable and alternative protein sources increases. In

terms of volume, the BSF market is expected to reach 8.23 million tons by 2033, driven by the rising demand in the animal feed industry, particularly in aquaculture and livestock sectors.

BSF Export and Import Trends:

- **Europe:** The European market for BSF feed is significant, with a valuation of USD 42.5 million in 2023 and projected to reach USD 290.4 million by 2030, growing at a CAGR of 37.75%



- **Asia-Pacific:** The Asia-Pacific region, particularly Southeast Asia, is also experiencing substantial growth. The market in Southeast Asia is expected to reach USD 137.8 million by 2033

BSF Market Drivers:

1. **Sustainability:** BSF larvae are increasingly used in feed production due to their ability to convert organic waste into high-quality protein, making them an eco-friendly alternative to traditional feed sources like soy and fishmeal.
2. **Rising Costs:** The high prices of traditional protein sources like fishmeal and soybean meal are pushing feed manufacturers to seek alternative sources such as BSF.
3. **Regulatory Support:** There is growing regulatory backing for the use of insect meal in animal feed, which further supports market growth (Vantage Market Research) (Meticulous Research).

Leading Players:

Key companies in the BSF feed market include Protix B.V., InnovaFeed, EnviroFlight LLC, and Nutrition Technologies Group, among others (Vantage Market Research) (24ChemicalResearch).

Overall, while BSF protein feed is still in its nascent stage compared to soybean and fishmeal, it holds significant potential due to its sustainability and high nutritional value. The market share is expected to increase as more industries adopt insect-based proteins for animal feed.

Competitive Advantage:

<i>Soybean Meal</i>	Black Soldier Fly (BSF) Larvae
Protein Content: Typically ranges from 44% to 48% (on a dry matter basis).	Protein Content: Ranges from 40% to 50% (on a dry matter basis).
Amino Acid Profile: Rich in essential amino acids such as lysine, which is particularly beneficial for livestock and poultry feed.	Amino Acid Profile: Contains all essential amino acids, but with a particular richness in methionine and lysine. The exact profile can vary depending on the larvae's diet.
Usage: Soybean meal is widely used as a primary protein source in animal feeds for poultry, swine, cattle, and aquaculture	Usage: BSF larvae are increasingly used as a protein source in animal feeds, especially in aquaculture, poultry, and pet food sectors. They are also valued for their high-fat content and the presence of beneficial lipids.

1. **Sustainability:** Black Soldier Fly Africa Ltd. addresses environmental concerns by recycling organic waste and reducing reliance on land and water-intensive protein sources.
2. **Cost Efficiency:** Our BSF protein feed is cost-competitive with traditional feed ingredients, providing economic benefits to our customers.
3. **Innovation:** We leverage advanced BSF cultivation techniques and waste management practices to offer high-quality products and services.
4. **Compliance:** In the long run climate change will push the globe towards sustainable products substitutions.

T echnology vs Productivity vs Innovation



A highly advanced BSF farm vs A general BSF Farm setting

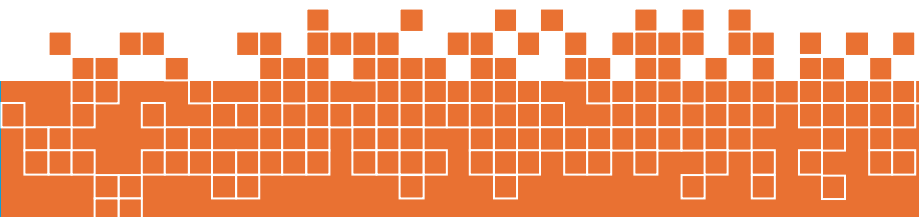
Estimated Cost of Producing 1 Metric Ton of BSF Protein in USA vs EU vs South Africa

1. USA

- **Estimated Cost:** \$1,200 to \$1,800 per metric ton.
- **Factors Influencing Cost:**
 - **Labor Costs:** Generally lower than in Europe, which can reduce production costs.
 - **Energy Prices:** Varies by region, but the USA typically has more competitive energy prices.
 - **Scale of Operations:** Larger facilities and more advanced technology can help lower costs through economies of scale.
 - **Regulatory Environment:** The USA has a developing regulatory framework for insect-based proteins, which may impose additional costs related to compliance and quality assurance.

2. Europe

- **Estimated Cost:** \$1,500 to \$2,200 per metric ton.
- **Factors Influencing Cost:**



- **Labor Costs:** Higher labour costs in Europe, particularly in countries like Germany, France, and the Netherlands.
- **Energy Prices:** Generally higher in Europe, which can increase production costs.
- **Regulatory Environment:** Europe has stricter regulations and standards for insect-based proteins, which can increase compliance and certification costs.
- **Sustainability Requirements:** European producers often face more stringent sustainability and environmental requirements, adding to operational costs.
- **Smaller Scale:** European BSF production may be smaller in scale compared to the USA, leading to higher per-unit costs.

Black Soldier Fly (BSF) protein production tends to be cheaper in African countries than in Europe due to several factors:

1. Labor Costs

- **Lower Wages:** Labor costs in many African countries are significantly lower than in Europe. BSF production can be labour-intensive, and lower wages reduce overall production costs.
- **Local Expertise:** In some regions of Africa, there is growing local expertise in insect farming, reducing the need for expensive expatriate or highly specialized labour.

2. Feedstock Availability

- **Abundant Organic Waste:** Many parts of South Africa have an abundance of organic waste that can be used as feedstock for BSF larvae. This waste is often cheaper if not for free to source compared to Europe, where waste disposal is more regulated and can be more expensive. Due to less competition for organic waste materials and lower transportation costs, the raw materials for feeding BSF larvae are often cheaper in Africa.

3. Climate and Environmental Conditions

- **Favourable Climate:** South Africa have a warm climate that is naturally suited to BSF farming, reducing the need for energy-intensive climate control systems (heating, cooling, and humidity control) that are often necessary in Europe.
- **Less Need for Infrastructure:** This in turn results in less need for advanced technological infrastructure.

4. Land and Facility Costs

- **Lower Land Costs:** The cost of land for setting up BSF production facilities is generally lower in South Africa due to the communal land system compared to Europe, especially in rural areas where land is abundant and affordable.
- **Cheaper Facility Setup:** The cost of building and maintaining production facilities, including rent, utilities, and construction, is also on the low in comparison.

5. Regulatory Environment

- **Less Stringent Regulations:** Some African countries have less stringent regulations regarding insect farming and feed production, which can reduce the costs associated with compliance, certification, and ongoing regulatory oversight in time of expanding the market for sales.
- **Faster Regulatory Approval:** In some cases, it may be quicker and less expensive to obtain the necessary approvals for BSF production in SA, which can reduce the costs of entry and operation.

6. Energy Cost

- **Lower Energy Costs:** though there is an energy crisis in South Africa the price of electricity is still less what our competitive counterpart are spending on electricity.

8. Logistics and Distribution

- **Reduced Logistics Costs:** For local markets, logistics costs are generally lower in SA and there is efficient public transport system to move the end product.
- **Proximity to Raw Materials:** Our BSF Farm will be located near sources of organic waste, minimizing transportation costs for feedstock.

In advanced markets and economies, BSF is still used for niche clients who can afford to purchase expensive but ecofriendly and sustainable markets. However, in our case we want to rear and produce the protein to be used by those who cannot afford the current feed protein prices for their livestock.

Rearing pilot plan

Estimation of BSF larvae production and waste reduction using pilot data gathered at Bunda - LUANAR BSF Farm Larval production estimates

Larval Production Estimates

- **Initial Inventory:**
 - **Number of Flies:** 50,000 flies
 - **Male/Female Ratio:** 2:3
 - **Female Egg-Laying Capacity:** 1 female lay approximately 450 eggs
- **Egg Production:**
 - **Number of Female Flies:** 30,000
 - **Total Eggs Laid:** 450 eggs x 30,000 females = 13,500,000 eggs
 - **Hatching Rate:** 75%
 - **Total Young Larvae:** 0.75 x 13,500,000 = 10,125,000 larvae
- **Colony Continuation:**
 - **Larvae Reserved for Breeding:** 1% of 5-day old larvae (DOL) = 101,250 larvae

- **Larvae for Harvest:** 99% of 5-DOL larvae = 10,023,750 larvae
- **Survival and Harvest:**
 - **Survival Rate to Harvest Stage (14-DOL):** 85%
 - **Total Larvae at Harvest:** $0.85 \times 10,023,750 = 8,520,187$ larvae
 - **Weight of Larvae at Harvest (14-DOL):** 200 larvae weigh approximately 80 grams
 - **Total Fresh Weight:** $(8,520,187 \text{ larvae} / 200) \times 0.08 \text{ kg} = 3,408$ kilograms
- **Final Dry Matter Content:**
 - **Moisture Loss Upon Drying:** 44%
 - **Total Dry Weight:** $3,408 \text{ kg} \times 0.56 = 1,908$ kg dry larvae

Waste Reduction Estimates

- **Substrate Reduction Index (SRI):**
 - **Dependence on Substrate Type:** High SRI for substrates with low fibre/cellulose content and low SRI for substrates with high fibre/cellulose content.
 - **Efficiency:** The efficiency of BSF larvae in reducing waste load is determined by the SRI. Higher SRI indicates better substrate efficiency.
- **Restaurant/Kitchen Waste:**
 - **SRI Range:** 2.8 - 3.4 (corresponding to a 74 - 83% reduction rate)
 - **Waste Processed:** 2,000 kg of kitchen waste
 - **Final Residue (BSF Frass):** Approximately 340 - 520 kg
 - **Use of Residue:** Can be further used as organic compost fertilizer for crop fields.

P

roject Implementation Strategy in the International Market:

GENERATE A Detail a comprehensive strategy for scaling the BSF farming project internationally, including market entry plans, partnerships, and distribution channels.

Distribution Plan for Black Soldier Fly Africa (BSF) Protein

Phase 1: South African Local Market

1. **Target Market Segments:**
 - **Poultry Farmers:** Poultry feed represents a significant portion of the animal feed market in South Africa. BSF protein can be marketed as a sustainable and high-protein alternative to traditional feeds.
 - **Aquaculture Industry:** The growing aquaculture sector in South Africa is a key market for BSF protein, especially for species like tilapia and catfish that thrive on high-protein diets.

- **Pet Food Manufacturers:** Target pet food manufacturers who are increasingly interested in sustainable and high-nutrition ingredients.
 - **Small-Scale Farmers:** Engage small-scale farmers who are looking for cost-effective and nutrient-rich feed options.
2. **Distribution Channels:**
- **Direct Sales:** Establish direct relationships with large poultry and aquaculture farms, offering bulk supply agreements.
 - **Retailers and Feed Stores:** Partner with agricultural supply stores and feed retailers to distribute BSF protein in smaller quantities.
 - **Online Sales:** Develop an e-commerce platform for direct sales to smaller farms and individual customers.
3. **Marketing Strategy:**
- **Education Campaigns:** Conduct workshops and seminars to educate farmers and feed manufacturers on the benefits of BSF protein.
 - **Partnerships:** Partner with agricultural cooperatives and industry associations to increase market penetration.

Phase 2: Expansion to SADC (Southern African Development Community)

1. **Target Countries:**
- **Namibia, Botswana, Zimbabwe, Zambia:** These countries have significant livestock and poultry farming sectors that could benefit from BSF protein.
 - **Mozambique, Angola:** Target the growing aquaculture sectors in these regions.
2. **Distribution Channels:**
- **Regional Distributors:** Partner with established agricultural distributors in SADC countries who can facilitate the import and distribution of BSF protein.
 - **Cross-Border Trade:** Leverage trade agreements within SADC to reduce tariffs and streamline cross-border distribution.

Phase 4: Global Expansion

1. **Target Regions:**
- **Asia (China, India, Southeast Asia):** These regions have large aquaculture industries and a growing demand for sustainable feed ingredients.
 - **Europe:** Target the high-end pet food market and organic farming sectors.
 - **North America:** Focus on the sustainable and organic farming markets, as well as pet food manufacturers.
 - **Latin America (Brazil, Mexico):** Large-scale poultry and aquaculture markets present significant opportunities.
2. **Distribution Channels:**
- **International Distributors:** Partner with global feed and ingredient distributors who have established networks in target regions.

R eturn on Investment

Using a scenario of one institutional partner. We can process its waste with a bare minimum of \$330,000. The bigger the investment opportunity the bigger the impact and processing unit.



The Joburg Market (next door to the Multiflora Market) is the largest fresh produce market in Africa — or the largest in the Southern Hemisphere, depending on who you talk to.

It discards an average of 5 metric tons of fresh produce to the landfill on a daily. We are currently negotiating with them to offtake all their waste.

To estimate the Return on Investment (ROI) for a Black Soldier Fly (BSF) farm processing 10 metric tons per day, we'll need to consider several factors:

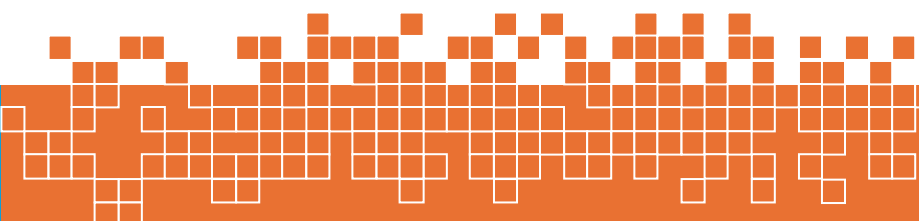
1. Initial Costs:

- **Initial Investment:** \$330,000
- **Capital Cost (Equipment, Truck, Building):** \$1,555,555
- **Total Initial Costs:** \$330,000 + \$1,555,555 = \$1,885,555

2. Operating Costs:

- These would include labour, utilities, raw materials (organic waste), maintenance, etc.
- Without specific details, we can estimate or use industry averages.

3. Revenue:



- **Revenue Sources:** Sale of BSF protein, frass (organic fertilizer), chitin, and potentially oils.
- **Price per Metric Ton of BSF Protein:** This varies, but let's assume an average of \$800-\$2,000 per ton based on current market rates.
- **Daily Revenue from BSF Protein:** For 10 metric tons per day, with a conservative estimate of \$1,000 per ton, the daily revenue is \$10,000.
- **Annual Revenue:** Assuming 300 operational days per year (accounting for maintenance and downtime), annual revenue would be \$10,000 * 300 = \$3,000,000.

4. ROI Calculation:

- **ROI Formula:**
$$\text{ROI} = \frac{\text{Net Profit}}{\text{Total Initial Investment}} \times 100$$
- **Net Profit:** Annual Revenue - (Operating Costs + Depreciation + Other Costs)
- **Assumptions for Other Costs:** Let's assume operating costs are 30% of revenue, depreciation over 10 years for capital costs, and no significant other costs.

Based on the assumptions made, the Return on Investment (ROI) for a Black Soldier Fly farm processing 10 metric tons per day is approximately above **60.12%** when deduct add all other unforeseen cost including loan repayment, packaging and distribution to the global market.

In the next 5 years and more BSF protein will gain so much popularity and acceptance across the globe globally and we wish to be part of that change.

As of 2024, the global soybean market is valued around \$150 billion annually. Capturing 2% of this market would be:

$$\text{Income} = 150 \text{ billion} \times 0.02 = 3 \text{ billion}$$

$$\text{Income} = 150 \text{ billion} \times 0.02 = 3 \text{ billion}$$

So, you would generate approximately \$3 billion in income.

Yours truly
 Founder and CEO of BSF Africa



Sebudisi Mafabatho
www.africanbsf.com

