

Phase I – BSF Feasibility Study & Market Validation in Ghana

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1. Purpose and Scope

Purpose of the Report

This report presents the findings of Phase I of the project, which focuses on the feasibility study and market validation for a Black Soldier Fly (BSF)-based biowaste management and animal feed business in Ghana. The purpose of this phase is to evaluate the technical, economic, and operational viability of the proposed business model, while also assessing market demand, customer segments, and competitive dynamics within the waste management and animal feed sectors. Through this analysis, the report aims to determine whether the BSF-based solution is a practical, sustainable, and scalable approach for converting organic waste into valuable protein products, thereby informing decision-making for potential investment and subsequent project development phases.

2. Scope of Work

This report covers Phase I of the project, focusing on feasibility study and market validation activities for a Black Soldier Fly (BSF)-based biowaste management and animal feed business in Ghana. The scope includes the following key components:

I. Biowaste Source Mapping

Assessment and identification of available biowaste streams suitable for BSF processing, including sources such as agro-industrial waste, market waste, and household organic waste. This component evaluates the quantity, consistency, and accessibility of feedstock required to sustain BSF production operations.

II. Market Demand Assessment

Evaluation of market demand for BSF-derived products, including dried larvae, BSF protein meal, BSF oil, and frass (organic fertiliser). The study targets key customer segments such as poultry farms, aquaculture (fish farms), pet food producers, animal feed manufacturers, and organic fertiliser buyers. It documents current feed and fertiliser prices, volumes purchased, customer willingness to trial BSF-based alternatives, and indicative purchase interest.

III. Pilot Customer Identification

Identification of 3–5 potential pilot customers willing to test BSF products. This includes engaging prospective clients and obtaining documented or written expressions of interest to support early-stage product validation and market entry.

IV. Stakeholder and Regulatory Overview

Review of the regulatory environment and identification of key stakeholders relevant to BSF operations in Ghana. This includes assessing permitting requirements and compliance considerations involving institutions such as the Environmental Protection Agency Ghana, Food

and Drugs Authority Ghana, Ghana Standards Authority, as well as municipal assemblies and free zones enclaves.

V. Pilot Site Identification

Identification and preliminary assessment of suitable locations for establishing a pilot BSF production facility, taking into account factors such as proximity to biowaste sources, access to target markets, infrastructure availability, and regulatory compliance requirements.

2.1 Biowaste Source Mapping

The target areas of sourcing biowaste for this project was either Tema or Accra, eventually we settled on the La Nkwatanang Madina Municipal Assembly in the Greater Accra region. The La Nkwatanang Madina Municipal Assembly generates approximately 125–126 tonnes of municipal waste per day, with markets and CBD areas contributing the majority, and Madina market standing out as one of the highest-density organic waste hubs, producing about 80.4 tonnes daily (of which only 60 tonnes are collected), with an estimated 61% organic composition, equating to roughly 48–50 tonnes of suitable BSF feedstock, meaning that even capturing 20–30% of this stream could yield 12–24 tonnes per day of viable input for larvae production.

Madina Market generates a diverse stream of waste dominated by organic materials such as vegetable residues (e.g., tomatoes, peppers, onions, buttery), fruit waste from overripe or unsold produce, and food scraps from cooked food vendors. This is often mixed with packaging materials like plastics and sacks, resulting in a largely biodegradable but poorly segregated waste stream. Sanitation observations indicate that waste accumulation intensifies during peak trading days, particularly Wednesdays and Saturdays. As a result, while the organic content is highly suitable for Black Soldier Fly (BSF) processing, it requires pre-sorting to remove contaminants before use.

Waste collection in the area is primarily managed by Zoomlion Ghana Limited under contract with the municipal assembly, using infrastructure such as 12m³ skip containers and haulage trucks for daily evacuation. However, operational inefficiencies such as delays caused by fuel shortages and contractor payment challenges often result in waste remaining on-site for extended periods. From a business perspective, this creates an opportunity for easier access and aggregation of feedstock. Notably, there is no standardized gate fee for waste at Madina Market; instead, assemblies typically pay contractors for waste collection, while traders contribute through sanitation fees and market tolls. This means that for a BSF enterprise, waste is generally accessible at no cost or even under paid service arrangements since it is treated as a liability rather than a commodity.

From an operational standpoint, the market offers clear advantages, including high daily waste volumes (exceeding 80 tonnes), a substantial organic fraction (approximately 60%), centralized

waste generation, and a consistent daily supply. However, these benefits are offset by challenges such as poor waste segregation, high contamination levels, irregular collection schedules, and broader sanitation and political considerations that must be managed carefully in project implementation.

Table 1.1 Madina Market Waste & BSF Feasibility – Summary Table

Section	Key Data	Simple Interpretation	Implication for BSF Project
Waste Volume (Market Area)	80.4 tonnes/day generated	High waste generation from market cluster	Strong and reliable feedstock source
	60 tonnes/day collected	20 tonnes/day remains uncollected	Opportunity to access unused waste
	20–30% capture = 12–24 tonnes/day	Even partial capture is significant	Enough for pilot to medium-scale BSF plant
Municipal Context	125–126 tonnes/day total waste	Market contributes major share	Madina is a key waste hotspot
Waste Composition	61% organic waste	Majority is biodegradable	Ideal for BSF larvae feeding
	48–50 tonnes/day organic fraction	Large usable portion	Supports large-scale production
Type of Waste	Vegetables, fruits, food scraps	High nutrient organic material	Good larval growth performance
	Plastics, sacks (mixed waste)	Contamination present	Requires sorting system
	Peak waste on Wed & Sat	Waste fluctuates during week	Plan collection around peak days
Collection System	Managed by Zoomlion Ghana Limited	Centralized waste handling	Potential partnership opportunity
	Skip containers + trucks	Existing logistics system	Can integrate into operations
	Delays (fuel, payments)	Waste stays longer at site	Easier access for collection
Cost / Gate Fee	No official gate fee	Waste not commercially priced	Likely free access
	Assembly pays contractors	Waste is a cost burden	Opportunity to be paid for removal
	Traders pay sanitation fees	Cost already embedded	No direct cost to BSF operator
	PPP / service models possible	Flexible entry options	Multiple business models available

Operational Strengths	≥80 tonnes/day volume	High availability	Scalable business potential
	60% organic	Good feed quality	High conversion efficiency
	Centralized market	Easy logistics	Lower transport cost
	Daily waste generation	Consistent supply	Stable operations
Operational Challenges	Poor segregation	Mixed waste	Requires preprocessing
	High contamination	Plastics, sand	Increases operational cost
	Irregular collection	Unpredictable timing	Needs coordination
	Political/sanitation issues	Sensitive environment	Requires stakeholder engagement
Strategic Opportunities	Partner with Assembly & Zoomlion Ghana Limited	Access to waste streams	Easier project setup
	Waste diversion model	Capture before landfill	Environmental & economic value
	Decentralized BSF plant	Near market location	Reduced logistics cost
	PPP model	Public-private collaboration	Scalable long-term solution
Feedstock Estimates	10–20 tonnes/day (conservative)	Small-scale start	Pilot phase
	20–40 tonnes/day (moderate)	Medium-scale plant	Commercial viability
	50+ tonnes/day (full scale)	Large-scale opportunity	Industrial production
Data Gaps	Organic vs inorganic split	Missing precision data	Needed for accurate design
	Seasonal variation	Unknown fluctuations	Affects supply planning
	Cost per tonne	Unknown real cost	Important for financial model
	Distance to landfill	Logistics factor	Impacts cost efficiency
Bottom Line	80 tonnes/day total, 50 organic	High-potential waste stream	Strong case for BSF project
	No gate fee	Waste is liability	Cost advantage for business

Link to spreadsheet

https://docs.google.com/spreadsheets/d/1Dr7W7SN8Gem97L8ifAnoSabKq75vXhjvytJ3paG2wI/edit?usp=drive_link

Table 1.2 Madina Market Assessment

Category	Sub-Category	Details	Implication for BSF Project
	Organic Waste	Plastics, sacks, packaging materials	Highly suitable for BSF larvae feed
	Inorganic Waste	Mixed and often contaminated	Requires removal before processing
	Waste Quality	Peaks on Wednesdays & Saturdays	Needs pre-sorting system
Collection System	Waste Pattern	Zoomlion Ghana Limited (under Assembly contract)	Plan collection around peak days
	Main Operator	12m ³ skip containers, haulage trucks	Potential partner for waste access
	Infrastructure	Daily (but inconsistent)	Existing system can be leveraged
	Collection Frequency	Fuel shortages, delayed payments	Opportunity to intercept waste
Cost / Gate Fee	Operational Gaps	No standardized fee	Waste remains longer easier access
	Gate Fee	Assembly pays contractors	Waste likely free or low-cost
	Payment Structure	Daily sanitation fees, market tolls	Waste seen as liability
	Trader Contributions	Free access / Paid collection / PPP	Indirect cost already covered
Operational Strengths	Business Model Options		Flexible entry strategies
	Waste Volume	≥80 tonnes/day	Large feedstock availability
	Organic Fraction	~60%	Strong BSF yield potential
	Waste Source	Centralized market cluster	Efficient logistics
Operational Challenges	Supply Consistency	Daily generation	Reliable operations
	Segregation	Poor waste separation	Requires sorting infrastructure
	Contamination	Plastics, sand, mixed waste	Increases processing cost
	Collection Issues	Irregular pickup cycles	Requires coordination
	External Factors	Sanitation & political sensitivity	Needs stakeholder engagement

Link to spread sheet

https://docs.google.com/spreadsheets/d/1E77z7-MXes756ScC5Km64S0IPnA0Vcy0WnR_bTsO6aM/edit?usp=drive_link

Figure 1.1 Photos from Madina Market







2.2 Market Demand Assessment

Market Engagement and Customer Identification

As part of the market validation process, direct engagements were conducted with key stakeholders within the animal feed value chain, including poultry farm owners and a feed milling company. These interactions were aimed at assessing awareness, interest, and potential demand for Black Soldier Fly (BSF)-derived products such as dried larvae, BSF protein meal, BSF oil, and frass (organic fertiliser).

The findings indicate that poultry farmers represent a primary target market, as they are actively seeking cost-effective and sustainable alternatives to conventional protein sources like fishmeal and soybean meal. Farmers expressed particular interest in dried larvae and BSF protein meal as feed ingredients, especially given rising feed costs. Similarly, engagement with the feed mill company revealed potential for incorporating BSF protein meal and oil into formulated feeds, provided that quality, consistency, and regulatory standards are met.

Beyond poultry and feed manufacturing, other identified target sectors include aquaculture (fish farms), pet food producers, and organic fertiliser users. While direct engagement was limited to poultry and feed milling in this phase, these sectors present strong potential demand for BSF products. Frass, as an organic fertiliser, is particularly relevant for crop farmers seeking sustainable soil improvement solutions.

Overall, the engagement confirms a growing market interest in BSF-based products, with poultry farms and feed manufacturers emerging as early adopters, while aquaculture and fertiliser markets offer additional expansion opportunities.

Table 1.3 Current Prices For Feed And Fertilizer

Feed	Prices	GHC
Soya local Production 50kg		820
Soya Foreign Produce 50kg		365
Fish Meal 50kg		405
Fertilizer		
Organic fertilizer 50kg		200

Figure 1.2 Photos From Feedmill (Aishmoo Enterprise Pantang Accra Ghana)





2.3 Pilot Customer Identification

As part of the feasibility study and market validation, several potential pilot customers were identified and engaged to assess their willingness to test Black Soldier Fly (BSF)-based products, including dried larvae and BSF protein meal.

The following poultry farms have been identified as potential pilot customers:

Table 1.3 Potential Pilot Customers

Customer Name	Location	Current Capacity	Maximum Capacity	Relevance For Pilot
Armi Farms Venture	Oyibi Accra	6,000 birds	25,000 birds	Medium-to-large scale farm with strong growth potential; suitable for structured feed trials
Boris B Farms	Kumasi	30,000 birds	30,000 birds	Large-scale operation; ideal for bulk testing and performance validation
Mr. & Mrs. Addo Farm	Tieman (near Madina, Accra)	1,000 birds	3, 000 birds	Small-to-medium scale; suitable for controlled pilot testing and early adoption

These farms represent a mix of small, medium, and large-scale poultry operations, providing a balanced base for pilot testing across different production levels. Initial discussions indicate a willingness to explore alternative feed options, particularly in response to rising feed costs.

Collectively, these potential pilot customers offer an opportunity to:

- Test product performance under real farm conditions
- Gather feedback on feed acceptance and animal growth performance

- Build early market validation and case studies for scaling

Further engagement will focus on securing formal expressions of interest and structuring pilot trials for BSF-based feed products.

Figure 1.3 Photos From Farms of Potential Pilot Customers

- Armis Fram Ventures



- Mr. & Mrs. Horlali Farms



Boris B Farms



2.4 Stakeholder and Regulatory Overview

1. Municipal Approval – La Nkwantanang Madina Municipal Assembly

Key Requirements:

- Business Operating Permit
 - Register business within the municipality
 - Pay annual operating fees
- Zoning & Land Use Approval
 - Confirm site is approved for waste processing/agro-industrial use
 - Obtain land use clearance
- Waste Handling Authorization
 - Approval to collect, transport, and process organic waste
 - Possible MoU with Assembly for waste sourcing
- Health & Sanitation Inspection
 - Site inspection by Environmental Health Department
 - Compliance with sanitation and public health standards

The outcome is Legal authorization to operate within the municipality.

Figure 1.4 Photo from Madina Municipality



2. Environmental Permit – Environmental Protection Agency Ghana

Key Requirements:

- Environmental Impact Assessment (EIA) or Environmental Permit
 - Submit project proposal (location, process, waste handling)
 - Conduct environmental assessment (may be preliminary or full EIA depending on scale)
- Environmental Management Plan (EMP)
 - Odour control
 - Wastewater management
 - Pest and vector control
- Permit Issuance
 - EPA reviews and approves before construction/operation

The outcome is approval to operate without causing environmental harm.

3. Feed/Product Safety Approval – Food and Drugs Authority Ghana

For BSF Larvae / Protein Meal (Animal Feed Use)

Product Registration

- Register BSF products as animal feed ingredients or additives

Facility Inspection

- FDA inspects production facility for hygiene and safety

Good Manufacturing Practices (GMP) Compliance

- Clean processing environment
- Traceability systems

Lab Testing

- Nutritional composition
- Microbial safety
- Absence of contaminants

The outcome is authorization to produce and sell BSF-derived feed products.



Figure 1.5 Photo from FDA

4. Standards Certification – Ghana Standards Authority

Key Requirements:

Product Standards Compliance

- BSF protein meal must meet feed quality standards
- Frass must meet organic fertiliser standards

Certification / Conformity Assessment

Testing for:

- Protein content
- Moisture levels
- Safety parameters

Labeling Approval

- Proper product labeling (composition, usage, safety)
- The outcome is to have Certified product quality and market acceptance.

Figure 2 Photo from GSA



5. Fertiliser Registration (Frass) – Food and Drugs Authority Ghana / (sometimes Ministry of Food & Agriculture involvement)

Key Requirements:

- Register frass as organic fertiliser
- Provide:
 - Nutrient analysis (NPK values)
 - Safety data
 - Field testing may be required

The outcome is to have approval to sell frass commercially as fertilizer.

6. Free Zones Approval (Optional) – Ghana Free Zones Authority

Applicable if export-focused

Key Requirements:

- Apply for Free Zones status
- Commit to:
 - Export $\geq 70\%$ of production
- Submit:
 - Business plan
 - Financial projections

Benefits:

- Tax incentives
- Duty exemptions
- Easier export processes

The outcome is to have Incentives for export-oriented BSF production

Table 1.4 (Summary Stakeholder regulatory overview Table)

Agency	Approval Required	Purpose
Municipal Assembly	Business permit, zoning, sanitation approval	Legal local operation
EPA Ghana	Environmental permit (EIA/EMP)	Environmental compliance
FDA Ghana	Product & facility registration	Feed and fertiliser safety
GSA Ghana	Standards certification	Product quality assurance
Free Zones Authority	Export license (optional)	Tax & export incentives

Key Practical Insight

The most critical approvals to start operations are:

1. Municipal permit
2. EPA environmental permit
3. FDA product approval
 - GSA certification strengthens market trust, but may follow initial setup
 - Free Zones is optional, depending on export strategy.

2.5 Pilot Site Identification

A confirmed pilot site has been identified at Oyibi, near Madina in Accra, through a proposal by the owner of Armi Farms Venture (Alhaji). In addition, discussions with the La Nkwantanang Madina Municipal Assembly indicate a willingness to support the project by facilitating access to an alternative site, subject to the submission and approval of a formal Public-Private Partnership (PPP) proposal. This presents an opportunity to secure both a privately initiated pilot location and a potential municipally backed site for scaling operations.

The following link shows the coordinates of Oyibi near Madina in the Greater Accra region .
<https://maps.app.goo.gl/JwnmtJpFNBvfd31V6>

3. Sales Potential Assessment

The sales potential for a Black Soldier Fly (BSF)-based business in Ghana is strong, driven by rising demand for alternative protein sources, increasing feed costs, and growing interest in sustainable agriculture. Market engagement conducted during Phase I confirms that poultry farmers and feed manufacturers are actively seeking cost-effective substitutes to conventional inputs such as fishmeal and soybean meal. Initial discussions with identified pilot customers including Armi Farms Venture, Boris B Farms, and Mr. & Mrs. Horlali Addo Farm indicates a clear willingness to trial BSF-derived products, particularly dried larvae and BSF protein meal.

The poultry sector represents the most immediate and scalable market opportunity. Farms with capacities ranging from 1,000 to 30,000 birds provide a diverse base for product testing and early adoption. Feed mill companies also present a significant sales channel, as they can incorporate BSF protein meal and oil into formulated feeds at scale, provided quality and regulatory standards are met. Beyond poultry, additional demand exists within aquaculture, pet food production, and organic fertiliser markets, where frass offers a sustainable alternative to chemical fertilisers.

From a supply perspective, Madina market and surrounding areas generate approximately 80 tonnes of waste daily, with an estimated 60% organic content. This provides a consistent and scalable feedstock base capable of supporting BSF production volumes aligned with market demand. Even conservative waste capture levels (10–20 tonnes/day) can sustain pilot-scale production, while moderate to large-scale operations (20–50+ tonnes/day) can meet growing commercial demand.

Importantly, the cost structure enhances sales potential. Organic waste is readily accessible with no standardized gate fee and may even attract payment for collection under service agreements. This significantly reduces input costs, allowing competitive pricing of BSF products while maintaining healthy margins.

Overall, the sales outlook is highly promising. Early adopter segments particularly poultry farms and feed manufacturers provide immediate entry points, while broader agricultural markets offer expansion opportunities. With proper product quality assurance, regulatory compliance, and strategic partnerships, the BSF business model demonstrates strong potential for revenue generation, scalability, and long-term market penetration in Ghana.

Table 1.5 Sales Potential Assessment – BSF Business in Ghana (Table Analysis)

Category	Key Data / Observation	Analysis	Sales Implication
Market Demand	Rising cost of fishmeal & soybean meal	Farmers seeking cheaper alternatives	Strong demand for BSF protein products
	Interest from poultry farmers	Direct engagement confirms willingness to try	Early adoption likely
	Engagement with feed mill company	Potential bulk buyer	Scalable sales channel
Target Customers	Poultry farms (1,000–30,000 birds)	Immediate and accessible market	Ideal for pilot and early sales
	Feed manufacturers	High-volume buyers	Long-term contracts possible
	Aquaculture & pet food sectors	Untapped but relevant markets	Expansion opportunities
	Organic fertiliser users	Demand for sustainable inputs	Market for frass
Pilot Customer Base	Armi Farms (6,000–25,000 capacity)	Medium-large scale	Suitable for structured trials

	Boris B Farms (30,000 birds)	Large-scale operation	High-volume demand potential
	Horlali Addo Farm (1,000–3,000 birds)	Small-medium scale	Controlled testing environment
Product Demand	Dried larvae & BSF protein meal	High demand for feed	Core revenue drivers
	BSF oil	Secondary product	Additional revenue stream
	Frass (fertiliser)	Growing interest	Diversified income
Supply Capacity	~80 tonnes/day waste available	High feedstock availability	Supports continuous production
	~60% organic (~50 tonnes/day)	Suitable for BSF processing	Enables scaling
	10–20 tonnes/day (pilot scale)	Feasible starting point	Immediate production possible
	20–50+ tonnes/day (scale-up)	Large production potential	Meets growing demand
Cost Advantage	No gate fee for waste	Low input cost	Competitive pricing advantage

	Waste seen as liability	Possible paid collection	Additional revenue opportunity
Revenue Potential	Multiple product streams	Feed + fertiliser markets	Diversified income base
	Large and growing poultry sector	Continuous demand	Stable revenue flow
Competitive Advantage	Local production of protein feed	Reduces import dependence	Market positioning advantage
	Sustainable waste recycling	Environmental benefit	Attracts institutional support
Risks / Constraints	Quality consistency required	Must meet standards	Investment in processing needed
	Regulatory approvals	Mandatory compliance	May affect time to market
	Market acceptance	New product awareness needed	Requires education and trials
Overall Sales Outlook	Strong demand + low-cost inputs	High viability	High sales growth potential

Link to spread sheet

https://docs.google.com/spreadsheets/d/1I87pgDQBbUeJ6j3CUEpZxoX0g-R23a1fow6qj-5fjW8/edit?usp=drive_link

Summary Outlook

- **Short-term:** Poultry farms and feed mills = immediate sales
- **Medium-term:** Scale through bulk buyers and partnerships
- **Long-term:** Expand into fertiliser and aquaculture markets

Table 2.0 Financial Projection (Pilot to Medium Scale)

Key Assumptions

Parameter	Value	Notes
Waste input	20 tonnes/day	Moderate pilot scale
Organic fraction	60%	From Madina waste data
Conversion rate (waste to larvae)	20%	Typical BSF efficiency
Operating days	300 days/year	Allowing downtime
Products	Larvae meal, dried larvae, oil, frass	Multi-revenue model

Link to spread sheet

https://docs.google.com/spreadsheets/d/1Odjs8U7INDukI9pHholiV65DK8jgg1GmEOc0GR4ARJw/edit?usp=drive_link

Table 2.1 Production Output (Annual Estimate)

Product	Yield Estimate	Annual Output
Fresh larvae	20% of input	4 tonnes/day
Dried larvae / protein meal	~30% of fresh larvae	1.2 tonnes/day (~360 tonnes/year)
BSF oil	~10% of larvae	120 tonnes/year
Frass (fertiliser)	~50% of waste	3,000 tonnes/year

Link to spreadsheet

https://docs.google.com/spreadsheets/d/1mknWVjOjxx8nbVYsBG81h42hTQ6kqCvQPmavdRl5MmQ/edit?usp=drive_link

Table Pricing Assumptions (Ghana Market)

Product	Estimated Price (USD/tonne)	Notes
BSF protein meal	\$800 – \$1,200	Competitive vs fishmeal
Dried larvae	\$900 – \$1,300	Premium niche market
BSF oil	\$700 – \$1,000	Feed additive
Frass fertiliser	\$50 – \$120	Bulk agricultural input

Link to spread sheet

https://docs.google.com/spreadsheets/d/187l0nSML6V9wOF8kh9L1x4o0ftgdosfXg38V3owC98U/edit?usp=drive_link

Table 2.2 Annual Revenue Projection

Product	Volume (Tonnes/Year)	Price (USD/tonne)	Revenue (USD)
BSF Protein Meal / Dried Larvae	360	\$900	\$324,000
BSF Oil	120	\$800	\$96,000
Frass Fertiliser	3,000	\$70	\$210,000
Total Revenue	—	—	\$630,000/year

Link to spreadsheet

https://docs.google.com/spreadsheets/d/10e6wyX72SSJ2NHnXr3j2gj5a3uaoHRp5mc4xjjtwGrU/edit?usp=drive_link

Table 2.3 Estimated Annual Costs

Cost Category	Estimated Cost (USD)	Notes
Labor	\$80,000	Staff, technicians
Waste collection/logistics	\$40,000	Transport, handling
Utilities (water, electricity)	\$30,000	Processing needs
Equipment maintenance	\$25,000	Repairs, upkeep
Packaging & distribution	\$35,000	Bags, transport
Regulatory & compliance	\$10,000	Permits, testing
Miscellaneous	\$30,000	Contingencies
Total Costs	\$250,000/year	

Link to spreadsheet

https://docs.google.com/spreadsheets/d/1kJEQBvfvR3eS6Gvs1TPeur5odcSjZhacYvVEKGM_tM8/edit?usp=drive_link

Table 2.4 Profitability Analysis

Metric	Value
Total Revenue	\$630,000
Total Costs	\$250,000
Net Profit	\$380,000/year
Profit Margin	~60%

Link to spreadsheet

https://docs.google.com/spreadsheets/d/1-ZTSv_zYskP1RWuG_Y42z1gReGQD2gxI2Lh0BMqGDm4/edit?usp=drive_link

Table 2.5 Scale Scenarios

Scale Level	Waste Input	Revenue Potential	Profit Potential
Pilot	10 tonnes/day	~\$300K/year	~\$150K/year
Medium	20 tonnes/day	~\$630K/year	~\$380K/year
Large	50 tonnes/day	\$1.5M+	\$800K+

Link to spread sheet

https://docs.google.com/spreadsheets/d/1ZyvnfXEMH2gJbyueUjX-uh1z1AtS2PKzVtqQyXV8rKE/edit?usp=drive_link

7. Key Financial Insights

Strong Profit indicators

- Free or low-cost waste input
- Multiple revenue streams (feed + fertiliser)
- High demand from poultry sector

Key Cost Risks Factors

- Logistics and waste handling efficiency
- Maintaining product quality standards
- Scaling operations too quickly

Investment View

- Break-even: Likely within 1–2 years
- Margins: High (50–60%) due to low input cost
- Scalability: Very strong with increased waste capture
- Market: Already validated (poultry farms + feed mills)

This BSF business model in Ghana shows high revenue potential, strong margins, and scalability, especially with secured waste supply from Madina and confirmed pilot customers

4.Contact List

CONTACT LIST

Organization / Entity	Contact Person	Role / Title	Phone Number
Boris B Farms	CEO	Chief Executive Officer	+233 24 437 0697
Armi Farms Ventures	Alhaji	Owner	+233 24 480 8089
Mr & Mrs Addo Farms	Mr. Addo	Co-owner	+2332470157 83
Aishmo Feedmill	Mr. Akwesi Asenso	Manager	+233 50 552 9975
La Nkwatanang Madina Municipality	Mr. Daniel Annan	Environmental Department	+233 24 831 6868
Food and Drugs Board	Mr. Benjamin	Customer Service	+233 55 111 2223
Environmental Protection Authority (Accra West)	Madam Peace Ayivor	Department Representative	+233 24 499 7987
Ghana Standards Authority	Customer Service	Customer Service Department	+233 20 133 8376

Link to spreadsheet

https://docs.google.com/spreadsheets/d/13i73U6oS18B9TqpPeLndcmOAwXflptbTIngwROqJ8sw/edit?usp=drive_link

5. Conclusions And Recommendations

The Phase I feasibility study and market validation confirm that establishing a Black Soldier Fly (BSF)-based biowaste management and animal feed business in Ghana is technically viable, economically attractive, and commercially promising.

From a feedstock perspective, Madina market and its surrounding areas within the La Nkwantanang Madina Municipal Assembly generate substantial volumes of waste (approximately 80 tonnes per day), with an estimated 60% being organic and suitable for BSF processing. This provides a reliable, low-cost, and scalable raw material base, with no standardized gate fee and potential for service-based revenue through waste management partnerships.

Market validation activities demonstrate clear demand for BSF-derived products, particularly within the poultry sector and among feed manufacturers. Engagements with pilot customers including Armi Farms Venture, Boris B Farms, and the Horlali Addo Farm indicate a willingness to test BSF-based feed products, especially as a response to rising costs of conventional protein sources. This positions poultry farms and feed mills as immediate entry points, with additional growth opportunities in aquaculture, pet food, and organic fertiliser markets.

Financial analysis further supports the business case, showing strong revenue potential and high profit margins (estimated 50–60%), driven by low input costs and multiple product streams (protein meal, oil, and frass). The model is also highly scalable, with production capacity directly linked to waste input volumes.

However, successful implementation depends on addressing key challenges, including waste segregation, product quality consistency, regulatory compliance, and stakeholder coordination. The regulatory pathway requiring approvals from agencies such as the Environmental Protection Agency Ghana, Food and Drugs Authority Ghana, and Ghana Standards Authority is manageable but requires careful planning and early engagement.

Overall, the project demonstrates strong potential to deliver economic, environmental, and social value, including waste reduction, local feed production, and job creation.

Recommendations

1. Proceed to Pilot Implementation

- Establish a pilot BSF facility at the confirmed Oyibi site
- Use pilot customers to conduct structured feeding trials
- Generate performance data (growth rates, feed conversion, cost savings)

2. Secure Waste Supply Agreements

- Formalize partnerships with the La Nkwantanang Madina Municipal Assembly
- Explore collaboration with Zoomlion Ghana Limited
- Ensure consistent access to 10–20 tonnes/day of organic waste for initial operations

3. Complete Regulatory Approvals Early

- Initiate environmental permitting with the Environmental Protection Agency Ghana
- Begin product registration with the Food and Drugs Authority Ghana
- Align products with standards from the Ghana Standards Authority

4. Develop a Strong Market Entry Strategy

- Focus initial sales on poultry farms and feed mill companies
- Offer pilot pricing or trial batches to encourage adoption
- Build case studies from pilot customers to support scaling

5. Invest in Waste Preprocessing Quality Control

- Install sorting systems to remove contaminants (plastics, sand)
- Implement Good Manufacturing Practices (GMP)
- Ensure consistent product quality to meet regulatory and market requirements

6. Explore Public-Private Partnership (PPP) Opportunities

- Submit a formal PPP proposal to the municipal assembly
- Leverage government support for land access and waste supply
- Position the project as a sustainable waste management solution

7. Plan for Scale-Up

- Design the pilot facility with scalability in mind
- Gradually increase waste input from 10 tonnes/day to 20–50+ tonnes/day
- Expand into additional markets such as aquaculture and fertiliser distribution

8. Strengthen Data and Monitoring Systems

- Collect operational data during pilot phase (waste input, output yields, costs)
- Track customer feedback and product performance
- Use data to refine financial projections and support investor engagement

Final Remark

The BSF business model in Ghana represents a high-impact opportunity at the intersection of waste management, agriculture, and circular economy development. With the right execution strategy anchored in strong partnerships, regulatory compliance, and market-driven production, the project is well-positioned for successful implementation and long-term growth.