Project Budget and Cost Breakdown (Laboratory-Based R&D) for Biopesticides and Bioherbicides Development

Project Duration: 18 months
Total Estimated Cost: ₦82.5 million

Budget Summary by Major Components

Budget Category Description of Key Activities Estimated Cost (₦ Million)

A. Laboratory Equipment & Apparatus Procurement or modification of bench-scale pyrolysis reactor (≤10 L/hr), condensers, condensate tanks, GC-MS/FTIR access fees, distillation units, and chemical-resistant fittings.
B. Feedstock Procurement & Preparation Collection and preparation (drying, shredding, sieving) of agricultural residues (rice husk, maize stalk, sawdust) and waste plastics for co-pyrolysis.
C. Chemicals, Reagents & Consumables Solvents, analytical reagents, sample bottles, filter media, PPEs, and laboratory consumables.
D. Characterisation & Analytical Testing Laboratory analysis (proximate, elemental, GC-MS, FTIR, HPLC), compound identification, and bioassays for pesticidal/herbicidal activity.
E. Research Personnel & Technical Staff Principal Investigator (1), Co-Investigators (2), Lab Technicians (2), Graduate Research Assistants (2) — stipends and honoraria.
F. Equipment Maintenance & Utilities Energy, laboratory maintenance, calibration, gas/fuel for reactor, water, ventilation, waste disposal.
G. Data Collection, Analysis & Documentation Data processing, statistical analysis, report preparation, and documentation.
H. Safety, Compliance & Waste Management Safety audits, chemical storage, PPE replacement, fume extraction system servicing.
I. Capacity Building & Internal Dissemination Seminar/workshop for 15–20 researchers, student training sessions on bio-based agrochemical development.
J. Project Management & Administrative Support Coordination, meetings, communications, progress reports, contingency for logistics
K. Contingency (≈ 5%) To account for inflation and unforeseen costs.
L. Total Estimated Cost ₦82.5 million.

Budget Justification

1. Laboratory Equipment (₦18m): Core apparatus needed for pyrolysis, oil collection, and compound characterisation.
2. Analytical Testing (₦10m): Covers chemical composition, bioassays, and evaluation of pesticidal/herbicidal efficacy.
3. Personnel (₦16m): Multidisciplinary expertise across chemical engineering, chemistry, and biology.

4. Feedstock & Consumables (₦11.5m): Supports continuous experimental runs for various waste types.
5. Utilities & Maintenance (₦5m): Critical for sustained operation of pyrolysis and analytical systems.
6. Safety & Waste Management (₦3m): Required for compliance with institutional and environmental standards.
7. Training & Dissemination (₦4.5m): Builds capacity among early-career researchers and aligns outcomes with NASENI's local innovation agenda.
8. Contingency (₦6m): Provides flexibility for cost escalation or minor equipment upgrades.

Cost Distribution by Year

Project Year Key Activities Estimated Cost (₦ Million)

Year 1 (Months 1–12) Reactor installation, feedstock collection, pyrolysis and oil **characterisation, initial bioassays ₦58.0 million**

Year 2 (Months 13–18) Process optimisation, repeat experiments, toxicity validation, report and dissemination ₦24.5 million

Total (18 months) ₦82.5 million

Potential Cost-Sharing (Optional)

Source Contribution (%) Value (₦ Million) Mode

NASENI: Core research funding

Research Institution: Laboratory space, manpower, utilities

Industry Partner: Testing chemicals, data sharing, field validation support

Total: ₦82.5 million