ESTIMATED BUDGET AND BUDGET JUSTIFICATION

Estimated Budget

The project budget is categorized into key cost components, which include project planning and design, materials procurement, fabrication and assembly, testing and evaluation, and overhead and contingency costs, to ensure transparency and effective allocation of resources:

Table 1. Project Planning and Design

Item	Description	Estimated Cost (₦)
Literature review and feasibility study	Review of existing palm kernel machines, data collection, and performance benchmarks	200,000
Design and simulation	CAD modeling, stress analysis, and performance simulations	250,000
Technical documentation	Preparation of drawings, specifications, and manuals	150,000
Subtotal		**600,000**

Table 2. Materials Procurement

Component	Material Used	Estimated Cost (₦)
Hopper, entry regulator, body frame, separator barrel	Mild steel (due to strength and availability)	350,000
Shafts and keys	Mild steel (high strength, machinability)	230,000
Gears	Cast iron (durability and wear resistance)	200,000
Hammer mill and blades	Mild steel (removable and replaceable)	250,000
Bearings, bolts, nuts and fasteners	Standard mechanical fittings	150,000
Prime mover (5 hp electric motor or engine)	To power cracking and separating units	450,000
Miscellaneous (paint, lubricants, welding and rods,)	Consumables for fabrication	170,000
Subtotal		**1,800,000**

Table 3. Fabrication and Assembly

Activity	Description	Estimated Cost (₦)
Cutting and machining	Lathe, milling, and drilling of components	200,000
Welding and joining	Frame, hopper, and assembly welding	150,000
Heat treatment	For shafts and hammer mill durability	80,000
Assembly and fitting	Putting together cracking and separating units	150,000
Subtotal		**580,000**

Table 4. Testing and Evaluation

Item	Description	Estimated Cost (₦)
Test samples	Palm kernels (various sizes, ~12,000 nuts)	130,000
Performance testing	Efficiency, throughput, and durability tests	200,000
Data analysis and optimization	Adjustment, tuning, and recalibration	200,000
Subtotal		**530,000**

Table 5. Overheads and Contingency

Item	Description	Estimated Cost (₦)
Transportation and logistics	Movement of materials and machine	300,000
Utilities (Electricity, water, etc.)	Workshop utilities during fabrication	250,000
Contingency (10%)	Unexpected costs	560,000
Subtotal		**1,110,000**

Table 6. Total Project Cost

Category	Subtotal (₦)
Project planning and design	600,000
Materials procurement	1,800,000
Fabrication and assembly	580,000
Testing and evaluation	530,000
Overheads and contingency	1,110,000
Total Estimated Budget	**₦4,620,000**

Budget Justification:

The budget allocation ensures cost-effectiveness and sustainability by prioritizing the use of locally available materials to reduce procurement costs while promoting local manufacturing. Investment in fabrication and testing is emphasized to guarantee durability, efficiency, and adaptability of the machine to various scales of operation. The inclusion of overhead and contingency ensures the project remains resilient to price fluctuations and unexpected challenges. This structured allocation maximizes value for money while supporting long-term scalability and commercialization.