Business Plan for the Design, Construction and Commercialization of Rice Threshing Machine

By

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Submitted

To

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1. Executive Summary

This business plan outlines the design, production, and commercialization of a high-performance rice threshing machine tailored for small and medium-scale farmers in Nigeria. The innovation bridges the gap between imported high-cost threshers and inefficient manual processing, offering a locally produced, durable, and efficient solution. The machine demonstrates a threshing efficiency of 93% and can process up to 4.4 tons of rice daily. Constructed from locally sourced materials, the production cost stands at ₦964,829.60 per unit, with a competitive selling price of ₦1,061,312.50. The venture promotes agricultural productivity, job creation, and national food security, with a projected ROI of 35% within 18 months.

2. Company Overview

The proposed business will operate as a local agricultural technology and engineering enterprise focusing on the production of cost-effective mechanized farm tools. The company's mission is to empower smallholder farmers by providing accessible technologies that enhance efficiency and minimize post-harvest losses. Strategic partnerships with local governments, cooperatives, and agricultural development agencies will ensure rapid adoption and scalability.

3. Product Description

The rice threshing machine separates rice grains from stalks efficiently using a rotary threshing chamber, blower, and sieving mechanism. It is powered by a 4.0 kW diesel engine, built from mild steel materials, and designed to be robust, portable, and easy to maintain. The product is engineered for rural environments, providing consistent operation and high throughput under diverse field conditions.

4. Market Analysis

Nigeria is among Africa's leading rice producers, with annual consumption exceeding 7 million metric tons. However, the nation's post-harvest losses remain high due to manual threshing methods and limited access to affordable mechanization. Imported threshers are expensive and difficult to maintain, creating a large demand for locally fabricated alternatives. With over 12 million smallholder rice farmers and expanding mechanization initiatives by the Federal Government, the market potential for local threshing machines is valued above ₦60 billion annually.

Key Competitors for Rice threshing machine manufacturing

Factors	Competitor 1	Competitor 2	Competitor 3	This project
Name of Competing Product	Rice thresher	Rice thresher	Rice thresher	Rice thresher
Name of Competitor Organization	Hanchuan Machine Tool Group Co., Ltd.	Zhengzhou Hanchuang Machinery Co., Ltd.	Olatech metal fab services ltd	This project
Price of the individual's/ company's product/ service(₦)	$750	**$800**	₦2,950,000	₦1,061,312.50
Region of Competitor Operations	China	China	Kwara	Taraba

5.0 Marketing and Sales Strategy

Marketing efforts will focus on agricultural cooperatives, NGOs, and government programs promoting rural mechanization. Field demonstrations and workshops will be conducted to showcase machine performance. Sales will be managed through authorized dealers, direct contracts with state agricultural development programs, and digital campaigns targeting agro-entrepreneurs. A customer support structure will be established for maintenance, spare parts supply, and user training.

5.1 Sales Strategy:

Direct sales and marketing by the project student

Product and Services Envisaged from the Project

Product name	Production quantity (units)	Selling quantity	Wholesale price of product (₦)	Annual sales (₦)
1ST Year Rice thresher production and sales	200	150	1,061,312.50	159,196,875
2ND Year thresher production and sales	300	200		212,262,500
3RD Year thresher production and sales	400	250		265,328,125
4TH Year thresher production and sales	500	360		382,072,500
TOATAL				**647,772,084.375**

6. Operational Plan

The production process involves design, fabrication, assembly, testing, and quality control. Manufacturing will take place in a medium-scale workshop with welding, machining, and assembly equipment. All components including shafts, blades, and mild steel sheets will be sourced locally to reduce costs. Initial monthly production capacity is projected at 10 units, with plans to scale to 100 units per six within two years. The company will employ 2 technical staff and 1 administrative personnel in its first phase of operations.

7. Management and Technical Team

The management team will include professionals in mechanical engineering, business administration, and agricultural economics. Technical oversight will be provided by COREN-registered engineers, ensuring compliance with industrial standards. Consultations with the Advanced Manufacturing Technology Development Institute (AMTDI) and agricultural experts will guide continuous product improvement.

8. Financial Plan

The cost and pricing structure for one unit of the rice threshing machine is summarized below:

Item	Description	Amount (₦)	Remarks
Material Cost (MC)	Locally sourced steel, bearings,excluding (diesel engine)	570,500.00	Base cost
Contingency (15%)	Fabrication variation allowance	85,575.00	Safety margin
Direct Labour Cost (30%)	Fabrication and assembly	171,150.00	Skilled labour
Intellectual Input (6%)	Engineering design and supervision	34,230.00	Technical input
Production Cost (PC)	Subtotal before overhead	861,455.00	Subtotal
Actual Production Cost (APC)	Including 12.5% overhead	964,829.60	Factory cost
Taxes (VAT + WHT)	Statutory deductions (5% + 5%)	96,482.90	Government levy
Selling Price	Final market price per unit	**1,061,312.50**	Retail value

The projected profit per unit is ₦96,483, representing a gross profit margin of 9.1%. Assuming annual production of 200 units, total revenue will reach ₦212.2 million, with net profits exceeding ₦19 million annually.

9. Funding Requirements and Returns Projection

To achieve full-scale production, an initial investment of ₦71.75 million is required. This capital will cover machinery acquisition, raw material procurement, and marketing expansion. The projected return on investment (ROI) is 35% within 18 months, with a break-even point anticipated

after the first production year. Long-term profitability will be sustained through economies of scale, recurring demand, and product diversification.

10. Risk Analysis and Mitigation

Potential risks include raw material price fluctuations, market entry of foreign competitors, and supply chain disruptions. Mitigation strategies involve establishing long-term supplier contracts, continuous innovation, and leveraging local partnerships for steady material supply. Comprehensive maintenance support and user training will ensure customer retention and reduce post-sale risks.

.**Market Forces**

SWOT Analysis

Strength	**Weaknesses**
Service will be cheaper	Lack of Capital
Quality goods to provide demand	funding
Opportunities Job opportunities	**Threats** Insecurity
Highly profitable	Natural Disaster

Budget

1. **Thresher cost**

Cost and pricing structure for one unit of the rice threshing machine

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	Locally sourced steel, bearings, excluding (diesel engine)	**570,500.00**

Therefore, Material Cost (MC) is (₦) 570,500.00 for one unit.

For ten units the total cost is **₦5,705,000.00**

2. **Equipment Required for this Project and subsequent production for sustainability**

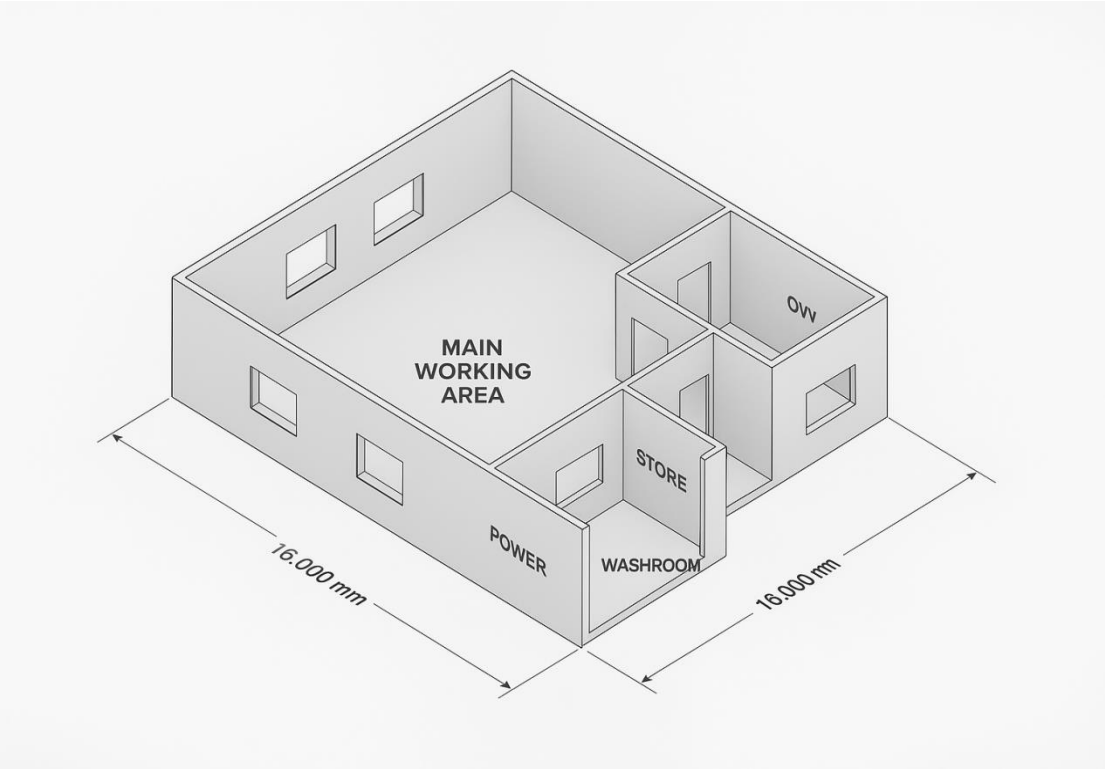
Item	Description	QTY	Unit price (₦)	Amount (₦)	Remarks
Welding machine	Maxmech INVERTER WELDING MACHINE MMA 400 3 Phase	1	450,000.00	450,000.00	Locally procured
Lathe machine (1M)	4 Axis CNC Lathe for 3D Turning,	1	6,000,000.00	6,000,000.00	Locally procured

	Milling, Broaching				
Standing drilling machine	Fervi T032da - 400v 0,85/1,1kw Floor Drill Press With Drive Belt	1	6,000.000.00	6,000.000.00	IMPORT procured
Hand drilling machine	Bosch Electric Drill Machine.	1	100,000.00	70,000.00	Locally procured
Angle drilling machine	Industrial-grade High-precision Bench drill 220V/380V 750W Drilling and milling	1	200,000.00	200,000.00	Locally procured
Milling machine standing	WARCO VMC VERTICAL MILLING MACHINE WITH STAND AND TOOLING - STOCK CODE 11357	1	5,000,000.00	5,000,000.00	Locally procured
Rolling machine (MINI)	Mild Steel 4" Rollers Mini Rolling Mill Machine	1	3,000,000.00	3,000,000.00	Locally procured

Plate bending machine	WC67K 30T1600 Sheet Metal Bending Machine NC Hydraulic Small Press Brake Machine	1	5,000,000.00	5,000,000.00	Locally procured
30KVA Generator Set	CUMMINS C38D5 1PH 30 kVA Single Phase Silent Diesel Generator	1	7,000,000.00	7,000,000.00	Import
Compressor for painting	Aegean 3.0HP 60L SILENCED AIR COMPRESSOR	1	1,500,000.00	1,500,000.00	Locally procured
Gas Welding Machine Set	110V/220V 6 in 1 Gas Mig/Gasless Flux Core/Stick/Lift Tig/Spool Gun/Syn Mig Wel	1	1,100,000.00	1,100,000.00	Locally procured
Hydraulic Press Set	Automatic 50 Ton H-Frame Hydraulic Punching Press	1	2,000,000.00	2,000,000.00	IMPORT
TOTAL				**37,000,000.00**	

3. Cost Estimate for structure (Using 9-inch Blocks)

Item	Quantity	Unit Cost (₦)	Total Cost (₦)
9-inch Blocks	2,062 pcs	₦350	₦721,700.00
Cement (for mortar)	150 bags	₦10,000	₦1,500,000.00
Sand (sharp)	30 tons	₦12,000/ton	₦360,000.00
Labor (floor)	265 m²	₦1,800/m²	₦477,000.00
Labour (blocks)	2,062pcs	₦150/biock	₦309,300.00
Other labour cost			₦560,000.00
Miscellaneous	—	₦500,000.00	₦500,000.00
Total Estimate	—	—	**₦4,428,000.00**

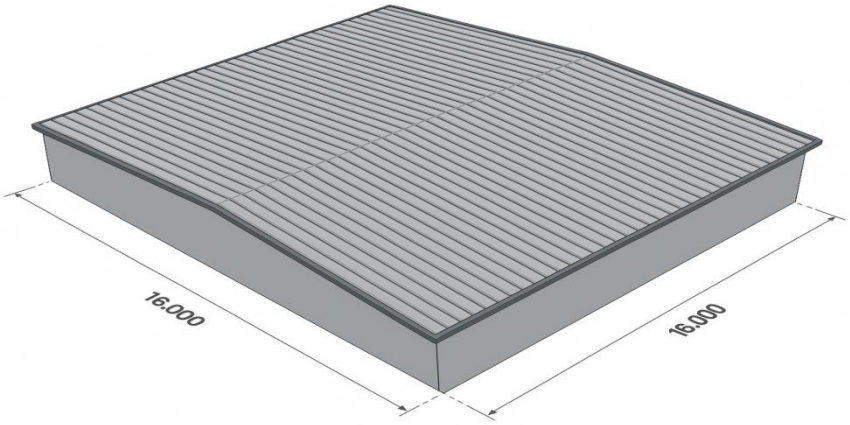


Main Workshop Plan

4 Roofing plan cost (dimensions & costing details)

Item	Qty (m or units)	Unit price (₦)	Cost (₦)
Roofing sheets (aluminium long-span)	282.68 m²	7,800 / m²	2,204,870.20
Purlins (Z/C) — total length	240 m	5,500 / m	1,320,000.00
Screws & flashings (estimated 10% of sheet cost)	—	—	220,487.02

Gutters & downpipes (PVC/Alu)	16 m + 2 downpipes	4,000 / m + 10,000 per dp	84,000.00
Labour for installation	282.68 m²	2,500 / m²	706,689.17
Transport & small contingency (approx)	—	—	50,000.00
Subtotal — Basic roofing (no heavy insulation)	—	—	4,586,046.38
Total with Installation ~~₦~~6,847,452.			**~~₦~~6,847,452**.



Roofing plan (dimensions & build details)

Conclusion and Recommendations

The Rice Threshing Machine business presents a sustainable and profitable opportunity in Nigeria's agricultural mechanization industry. It combines technical feasibility, economic viability, and strong social impact. The proposed model ensures affordability, job creation, and enhanced productivity for rice farmers. Investor participation will accelerate national agricultural modernization and contribute to long-term economic growth.