



EXECUTIVE SUMMARY: PALM OIL PROFITABILITY STUDY

INTRODUCTION

This report outlines the initial phase of the Palm Oil Yield and Production Data Project, focused on gathering and documenting key datasets for analyzing palm oil performance, costs, and regional yield drivers in Nigeria. The goal of this stage was to establish reliable, well-sourced baseline data that will later inform productivity modeling, cost benchmarking, and strategic recommendations for improving sector efficiency.

Data was collected from reputable sources including FAOSTAT, NIFOR, Okomu PLC, Presco PLC, USDA, and NIMET, alongside spatial and market data from Nigerian property and commerce portals. Each dataset was cleaned and saved as structured CSV files, ensuring compatibility with analytical tools like Python, Power BI, and GIS platforms.

This foundational dataset will support later stages focused on data cleaning, exploratory analysis, and performance modeling.

Data & Methodology

This analysis integrates **state-level yield, cost, and pricing datasets** sourced from:

- **FAOSTAT** agricultural output data (Nigeria, 2010–2024)
- **State agronomic and cost records** (tableau_cost_breakdown.csv, raw_state_data.csv)
- **Company benchmark data** (industry leaders' yield, cost, and extraction efficiency)
- **Market price time series** (# / tonne of CPO, 2015–2025)

The model assumes:

- **Yield data represents FFB**, converted to **CPO at 22% extraction efficiency**.
- **Average CPO price**: # 250,000 / tonne (state-adjusted from market data).
- **Operating cost per hectare**: # 1.4 – # 2.1 million (aggregated from input breakdown).
- **Establishment CAPEX**: # 4 million per hectare (industry mean).

Profitability Model

For each state:

- CPO Yield (t/ha) = FFB Yield (t/ha). $\times 0.22$
- Revenue/ha = CPO Yield (t/ha) \times Price per tonne
- Profit/ha = Revenue/ha - Operating Cost/ha
- Break-even scale to reach ₦1 billion = ₦1,000,000,000 \div Profit / ha
- ROI and payback period are calculated from total CAPEX + OPEX investment to achieve target scale.

Key Insights and Findings

- Top-performing states combine high FFB yields, good rainfall distribution, and lower logistics cost.
- Average profit per hectare ranges ₦300,000 – ₦1,200,000, depending on cost structure.
- To achieve ₦1 billion annual profit, plantations require 1,000 – 3,500 ha in optimal states.
- ROI averages 22 – 35%, with payback periods between 3.5 – 5.2 years under stable price scenarios.

Top 3 Recommendations

Rank	State	Average profit/ha (N)	Hectares for 1,000,000,000 (N)	payback (years)
1	Edo	1,200,000	833	3.5
2	Ondo	950,000	1,050	4.1
3	Cross River	780,000	1,282	4.8

Business recommendations

- Start with a 1,000–2,000 ha pilot estate in Edo or Ondo, using hybrid tenera seedlings and modern mill contracts.
- Integrate value chain, on-site milling and direct CPO export to enhance margin stability.
- Leverage federal/state incentives for agri-investment (CBN Palm Revival Program).
- Prioritize data verification: field rainfall, soil fertility, and logistics cost validation for each shortlisted state.
- Scale to 3,000 – 5,000 ha within 5 years for sustained ₦ 1 billion + annual profit.

Assumptions and limitations

- Data represents national and industry averages , actual yields and costs vary by estate management, climate, and palm variety.
- Price volatility and FX fluctuations were not fully modeled.
- Spatial and climatic data (rainfall, soil type, distance-to-mill) should be validated in feasibility stage.

Conclusion

- Nigeria's palm oil sector remains highly profitable at scale, with ₦ 1 billion annual profit attainable through efficient mid-sized estates ($\geq 1,000$ ha) in southern rainforest zones.
- Strategic investments in Edo, Ondo, and Cross River States offer the most favorable combination of yield potential, cost efficiency, and return on investment.

Data source Documentation

PRIMARY DATA SOURCES:

1. FAOSTAT (Food and Agriculture Organization)

- URL: <https://www.fao.org/faostat/en/#data/QCL>
- Data: Palm oil production, area harvested, yield (2010-2022)
- Use: National level benchmarks and trends

2. Okomu Oil PLC Annual Reports (2020-2023)

- URL: <https://okomugroup.com/>
- Data: Yield benchmarks, cost structures, pricing
- Use: Commercial plantation performance benchmarks

3. Presco PLC Annual Reports (2020-2023)

- URL: <https://presco-plc.com/>
- Data: Operational metrics, financial performance
- Use: Industry cost and revenue benchmarks

4. FAO Analysis of Incentives and Disincentives

- URL: <https://openknowledge.fao.org/>
- Data: Cost structures, profit margins, policy impacts
- Use: Cost modeling and margin analysis

5 All costs in 2023 NGN values

```
with open('data_sources_documentation.txt', 'w') as f:  
    f.write(sources_doc)
```

6. World Bank Climate Data Portal

- URL: <https://climateknowledgeportal.worldbank.org/>
- Data: Rainfall patterns, climate conditions
- Use: Yield correlation analysis

7. PropertyPro.ng

- URL: <https://www.propertypro.ng/>
- Data: Land price proxies across states
- Use: Land acquisition cost estimates

8. Jiji.ng

- URL: <https://jiji.ng/>
- Data: Agricultural equipment prices
- Use: Capital expenditure estimates

PROXY DATA AND ASSUMPTIONS:

- Labor costs: Based on agricultural wage data from national statistics
- Input costs: Fertilizer, pesticides from market surveys
- Processing costs: Industry benchmarks from company reports
- Yield adjustments: Based on soil quality and climate conditions

DATA QUALITY NOTES:

- Company data represents best-case commercial operations
- Smallholder yields typically 30-50% lower than commercial
- Land costs vary significantly within states

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