

**PROFITABILITY ANALYSIS OF CASSAVA PRODUCTION IN
ORHIONMWON LOCAL GOVERNMENT AREA OF EDO STATE, NIGERIA**

BY

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DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

SERVICES

FACULTY OF AGRICULTURE

UNIVERSITY OF BENIN

BENIN CITY

NOVEMBER 2025

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**BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF
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OF AGRICULTURE, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL
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CERTIFICATION

This is to certify that this project research work on the profitability analysis of cassava production in Orhionmwon local government area, Edo State, Nigeria was carried out

by **Olaoluwa Freda ADIGUN** with Matriculation Number **AGR2000003** in the Department of Agricultural Economics and Extension Services, University of Benin, Benin City, Edo State, Nigeria under my supervision.

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DATE

DATE

DEDICATION

This work is dedicated to Almighty God who saw me through the B. Agric Programme successfully and to my wonderful parents, Mr. Cornelius Adigun and Mrs. Queen Adigun for their financial support, love, and encouragement and my lovely siblings, friends and family for their love and support always.

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ABSTRACT

This study analyzed the profitability of cassava production in Orhionmwon Local Government Area of Edo State, Nigeria. The research specifically examined the socio – economic characteristics of cassava farmers, estimated production costs and returns, identified factors influencing profitability, and documented constraints faced by producers. A two – stage sampling technique was employed to select 100 cassava farmers from five major farming communities in the local government area. Primary data were collected using structured questionnaires and analyzed using descriptive statistics, budgetary analysis, and multiple linear regression.

Findings revealed that cassava production in the area is dominated by small – scale farmers with a mean age of 42 years, average farm size of 1.3 hectares, and relatively high educational attainment. Budgetary analysis showed the enterprise to be profitable with a gross margin of ₦107,929.46 and net profit of ₦67,054.70 per farmer per production cycle, yielding a net profit margin of 25.4%. Regression results identified farm size, yield and fertilizer cost as significant positive determinants of profitability

at 5% significance level, while farming experience was significant at 10% level. Major production constraints included unstable market prices, poor access to credit, insufficient funds and high labor costs.

This study concludes that cassava production remains a profitable enterprise in the study area. Recommendations include enhancing farmers' access to formal credit facilities, improving market information systems to reduce price volatility, promoting adoption of improved cassava varieties, and encouraging cooperative farming to achieve economies of scale. These interventions would significantly improve the income generation potential of cassava production for smallholder farmers in the region.

CHAPTER ONE

INTRODUCTION

1.1 Background Study

Cassava (*Manihot esculenta*) is one of Nigeria's most important staple crops, providing food security and income for millions of small-holder farmers. It is a drought-resistant crop that thrives in Nigeria's tropical climate, making it a key agricultural commodity (Food and Agriculture, 2020). Nigeria is the world's largest producer of cassava accounting for about 20%-25% of global production. However, despite its high production levels, Nigeria has not fully maximized its potential in processing and export compared to countries like Thailand and Vietnam (International Institute of Tropical Agriculture, Cassava Bulletin, 2022). Cassava is a major source

of carbohydrates for over 180 million Nigerians, consumed as garri, fufu, tapioca and other derivatives. Over 6 million farmers are engaged in cassava cultivation, while millions more work in processing and trading (FAO, 2021).

Nigeria exports cassava chips, starch and flour to countries like China, the Netherlands and neighboring African countries (Nigerian Export Promotion Council, 2022). Despite being the top global producer, Nigeria accounts for less than 1% of global cassava export earnings due to post-harvest losses (30-40%) and limited processing into high-value products (FAO, 2021). Nigeria produces over 60 million metric tons annually, making it the world's largest cassava producer (FAO, 2023). Nigeria processes less than 10% of its cassava into high value products unlike Thailand (The largest processor) which processes over 50% and controls 60% of global cassava trade (FAO, 2022). Nigeria exports mainly cassava chips (for animal feed) and starch, but its global market share is small compared to Thailand (NEPC, 2021). Cassava is grown across Nigeria but the following states are the leading producers:

Top Cassava-Producing States (Southand Middle Belt and Northern Regions); 1. Oyo State- Largest Producer, 2. Delta State, 3. Edo State, 4. Ogun State, 5. Benue State, 6. Kogi State, 7. Cross River State, 8. Imo State, 9. Anambra State, other states according to their levels are: 10. Rivers State, 11. Akwa-Ibom State, 12. Ekiti State, 13. Ondo State, 14. Abia State, 15. Enugu State, 16. Kebbi State, 17. Nasarawa State, 18. Taraba State and Plateau State.

1.2 Statement of Problem

Cassava is a major staple crop in Nigeria, contributing significantly to food security and employment. Despite its importance, cassava farmers face numerous challenges, including low yields, high production costs, poor access to markets, and price fluctuations (Ojiako and Okechukwu, (2019). These factors often lead to low profitability, discouraging investment in cassava farming and limiting its potential to enhance rural livelihoods (World Bank, 2020). This study seeks to examine the profitability of cassava production in Orhionmwon local government area by analyzing key factors such as input costs, yield levels and market prices. The research aims to identify the major constraints affecting profitability and recommend strategies to improve income generation for cassava farmers. Findings from this study will provide valuable insights for policymakers, agribusiness stakeholders, and farmers to enhance the economic sustainability of cassava production in Nigeria. Against this backdrop, the researcher seeks to find answers to the following research questions viz;

1. What are the socio-economic profiles of cassava farmers in Orhionmwon local government area?
2. What are the cost structures, revenue and profitability levels of cassava production in Orhionmwon local government area?
3. What factors significantly influence the profitability of cassava farming and
4. What are the major constraints limiting cassava production and profitability in the study area?

1.3 Objectives of the Study

The main objective of the study is to analyze the profitability of cassava production in Nigeria. To achieve this objective, the specific objectives are to viz;

1. describe the socio-economic characteristics of cassava farmers in Orhionmwon local government area.
2. estimate cost and returns and profitability of cassava production in Orhionmwon local government area.
3. examine factors influencing the profitability of cassava production in Orhionmwon local government area.
4. identify the constraints for cassava production in Orhionmwon local government area.

1.4 Justification of the Study

Previous studies have examined cassava production systems (Okechukwu and Dixon, 2022) and value chain dynamics (Adebayo, 2020), but few have comprehensively analyzed the cost-benefit ratios and profitability determinants across different farming scales and regions. In Southeast Asia, cassava profitability is driven by industrial demand (e.g. starch, ethanol) while in Africa, reliance on subsistence markets keep profits low. Bridging this gap requires policy incentives for commercial processing (FAO, 2020), while a lot of research has been done on cassava profitability in Africa, to the researcher's knowledge there is limited research on profitability of cassava in Edo state. Edo state's cassava sector suffers from underinvestment in research and development compared to states like Ogun and Kogi (FAO, 2021).

This study is based on the premise that Edo State holds untapped potential for agricultural growth through cassava production (IITA, 2020) as recent shifts in global demand for cassava-based products (biofuels, gluten-free flour) necessitate updated profitability analysis (FAO, 2020). The aim of this study is to show the economic value of cassava production in establishing the socio-economic and policy strategies required to stimulate the enterprise. This research aims to fill that gap by evaluating the key factors influencing cassava profitability, including input costs, market access, and policy interventions, thereby providing actionable insights for farmers, agribusiness and policymakers.

This study would be significant and a source of reference to students who are interested in carrying out investigations and researchers based on related problems. Understanding profitability helps policymakers and farmers optimize cassava production strategies, as noted in International Food Policy Research Institute (2019). This study will equally be useful to policy makers, researchers and other relevant stakeholders who may wish to accumulate data on profitability of cassava production for investment decision making in the cassava sub-sector.

CHAPTER TWO

LITERATURE REVIEW

2.1 Origin of Cassava

Cassava (*Manihot esculenta*) also known as manioc, yuca or tapioca is a tropical root crop that serves as a staple food for over 800 million people worldwide (FAO, 2023). Its remarkable adaptability to poor soils and drought conditions has made it a critical crop for food security in Africa, Asia and Latin America. Cassava has its deepest roots in the neotropics of South America, with strong evidence pointing to west-central Brazil as its center of origin. Wild populations of *M. esculenta* subspecies *flabellifolia* identified as the progenitor of domesticated cassava are concentrated in this region. Archaeological and genetic studies suggest that cassava was first domesticated no more than 10,000 years ago by indigenous people in what is now known as Brazil and Paraguay (Olsen and Schaal, 1999). The earliest direct evidence of cassava cultivation comes from archaeological sites namely: The Gulf of Mexico lowlands (4600 BC) where cassava pollen appears at the San Andrés site, indicating early spread from its origin (Pope *et al.*, 2000).

By the time of European contact in 1492, cassava had become a staple food for native populations across northern South America, southern Mesoamerica, and the Caribbean islands. The Taino people in particular had developed sophisticated cultivation methods using a high-yielding form of shifting agriculture with which they made “**casabe**” which was also known as cassava bread (Rouse, 1992). Cassava belongs to

the Euphorbiaceae family, with the scientific name *Manihot esculenta* Crantz. It is a woody shrub that grows 1-3 meters tall with conspicuous, almost palmate leaves resembling those of the related castor – oil plant but more deeply parted into five to nine lobes. The plant stores starch in its long, tapered tuberous roots which have a rough brown rind and white or yellowish flesh.

The introduction of cassava to Africa marks one of the most significant chapters in the crop's global dispersion. Portuguese traders played a pivotal role in this transfer, bringing cassava from Brazil to Africa in the 16th century though some sources record it as 1558 (Jones, 1959). The crop's spread across the African continent occurred through multiple pathways namely: Missionary activities whereby Roman Catholic missionaries introduced cassava to inland areas like Burkina Faso in the late 19th century (National Institute of Environment and Agriculture, Burkina Faso 2016) and also African traders facilitated its spread from coastal areas like the gold coast (modern Ghana). In Burkina Faso, historical records show cassava was introduced between the second half of the 19th century and early 20th century through two main routes: White missionaries in Sanguie province and local traders from Ghana in Sissili (NIEA, 2016). The main initial variety introduced was 'Banfti' with improved varieties like V5 (94/0270) and Banké (V2) being developed later.

Cassava's adoption in Africa was accelerated by its resilience during food shortages. As noted in Burkina Faso "Cassava contributes greatly to household food security during food shortage period. It sustains families for weeks as food and is also

exchanged with other foods or sold to buy food or meet household needs” (NIEA, 2016). This pattern repeated across sub – Saharan Africa, where cassava became the third – largest source of carbohydrates after rice and maize. It was also introduced into the Asia continent by multiple colonial powers, the crop reached Asia around the 17th century. Among the Asia countries Thailand cassava’s industry deserves a special mention, from humble beginnings as a crop planted in between rubber tree row in Songkhla Province, it grew to make Thailand the world’s largest exporter of tapioca flour (FAO, 2023). The country now plants cassava in approximately seven million rais (about 1.12 million hectares) across 48 provinces, producing over 20 million tons of roots annually (FAO, 2023). Today, cassava has become a global crop with diverse applications. More than 500 million people depend on it as a food source, with Africa accounting for approximately half of world production (FAO, 2023). Nigeria stands as the world’s largest producer while Thailand stands as the world’s largest exporter of cassava starch.

2.2 Theoretical Framework

Understanding profitability requires a foundation in economic theory. Profit is the financial surplus when total revenue exceeds total cost, and it is essential for business sustainability and growth (Hubbard,2018). Several theories explain the existence and persistence of profit:

1. Risk – bearing theory (Knight, 1921): This theory posits that profit is the reward entrepreneurs earn for bearing uninsurable risks and uncertainties in the market.

2. Innovation Theory (Schumpeter, 1934): Schumpeter argued that profit arises from successful innovations, which grant firms a temporary monopoly, allowing them to earn supernormal profits until competitors imitate the innovation.
3. Market Power Theory (Robinson, 1933): This theory suggests that firms can earn sustained profits through market dominance, patents, or other barriers to entry that allow them to set prices above competitive levels.
4. Theory of Competitive Advantage (Porter, 1985): Profit is derived from a firm's ability to create a sustainable competitive advantage, either through cost leadership (being the lowest – cost producer) or differentiation (offering a unique product or service).

From a microeconomic perspective, a profit-maximizing firm will operate at the point where marginal revenue equals marginal cost. These theories provide a lens through which to analyze the profitability of cassava farming, where farmers act as entrepreneurs bearing risks (climate, market), potentially adopting innovations (improved varieties) and operating within specific market structures.

2.2.1 Factors that Affect Profitability

Profitability is influenced by a combination of internal operational efficiencies and external market forces. These factors can be categorized as follows:

1. Internal factors (Controllable by management)
 - A. Revenue Generation

- i. Pricing strategy: Competitive pricing vs premium pricing affects margins. In agriculture, farmers can choose to sell their raw produce at the prevailing farm – gate price or add value through processing (e.g., turning cassava into garri, starch or flour) to command a premium price.
- ii. Product mix: Selling high – margin products boost overall profitability. Diversifying crops or livestock can stabilize revenue. A farmer growing only cassava is vulnerable to price crashes or disease. Introducing high – value crops like vegetables or legumes can improve overall farm profitability. (Knight, 1921), (FAO, 2023).

B. Cost Management

- i. Operational efficiency: Lean processes reduce waste and lower production costs. This is central to agricultural profitability, inefficient use of inputs like seeds, fertilizer, and water directly increases the cost of production, (Federal Ministry of Agriculture and Rural Development ,2023).
- ii. Supply chain optimization: Bulk purchasing and efficient logistics reduce expenses. For smallholder farmers, collective action can reduce costs. Forming cooperatives to bulk inputs for purchase or outputs for transport can lead to significant savings (African Development Bank, 2022).

C. Financial Structure

- i. Debt management: High – interest loans reduce net profit but access to credit is crucial for purchasing inputs. (Central Bank of Nigeria, 2023).
- ii. Working capital management: Efficient management of inventory (e.g., stored grain, harvested roots) and receivables (money owed by buyers) is vital. Post – harvest losses represent a direct loss of working capital. (Nigerian Stored Product Research Institute 2022).

2. External Factors (Market and Environmental Influences)

A. Market Conditions:

- i. Competition: Intense competition can force price reductions, squeezing margins. The presence of many small – scale farmers selling a homogenous product (like cassava roots) often leads to intense price competition, especially during the peak harvest season. (National Bureau of Statistics, 2023).
- ii. Consumer demand: Shifts in preferences (e.g., digital over physical products) impact sales, create new markets or depress existing ones (FMARD, 2021)

B. Regulatory and Political Factors:

- i. Government policies: Taxes, tariffs, and subsidies directly impact the cost structure and market access for farmers.
- ii. Trade regulations: Export/import restrictions can limit market access (FAO, 2023)

C. Technological and Industry Trends

- i. Automation: Mechanization of planting and harvesting can drastically reduce labor costs, which are often the largest variable cost in agriculture (FMARD, 2023).
- ii. Innovation: The adoption of improved technologies is a major driver of profitability. This aligns directly with Schumpeter's innovation theory (1934).

3. Strategic Decisions Impacting Profitability

A. Competitive Advantage

- i. Cost – leadership (Porter, 1985): A farm can achieve profitability by being the lowest – cost producer in its region.
- ii. Differentiation (Porter, 1985): A farm can command a premium price by offering a unique product.

B. Risk Management:

- i. Diversification: This is a core risk management strategy in agriculture to cope with climate and market volatility.

2.2.2 Common Methods of Profitability Analysis

The most widely used methods of profitability analysis are listed below:

1. Ratio analysis: Profitability ratio measure financial performance relative to revenue, assets or equity.

Key ratios:

- A. Gross profit margin: Measures production efficiency before overhead costs.

$$\text{Gross profit margin} = \frac{\text{Revenue} - \text{Cost of Goods Sold}}{\text{Revenue}} \times 100$$

- B. Net profit margin: Evaluates overall profitability after all expenses.

$$\text{Net profit margin} = \frac{\text{Net Income}}{\text{Revenue}} \times 100$$

- C. Return on Assets (ROA): Assesses how efficiently assets generate profit.

$$\text{ROA} = \frac{\text{Net income}}{\text{Total assets}} \times 100$$

- D. Return on Equity (ROE): Measures return to investors

$$\text{ROE} = \frac{\text{Net income}}{\text{Shareholder's Equity}} \times 100$$

2. DuPont Analysis: Breaks down ROE into three components to identify profitability drivers:

$$\text{ROE} = \text{Net profit margin} \times \text{Asset turnover} \times \text{Equity multiplier}$$

Net profit margin: profitability per sale

Asset turnover: efficiency in using assets.

Equity multiplier: Financial leverage

Use case: Reveals whether high ROE stems from margins, efficiency or debt (Palepu and Healy, 2023).

3. Break – even analysis: determines the sales volume needed to cover costs, it also identifies minimum sales required to avoid losses; it is used in pricing and cost – control strategies (Horngern *et al.*, 2023).

Break – Even Point (Units) = Fixed costs ÷ Price per unit – Variable cost per unit.

4. Cost – Volume – Profit (CVP) Analysis: Examines how changes in costs and volume affect profit; helps in making decisions for pricing, product mix, and scaling.

$$\text{Profit} = (\text{price} \times \text{quantity}) - (\text{Fixed costs} + \text{variable costs} \times \text{quantity}).$$

5. Trend Analysis: Compares profitability metrics over time to identify patterns:
 - Horizontal Analysis: Year – over – year comparison of financial statements.
 - Vertical Analysis: Expenses as a percentage of revenue
 - Use case: Detects declining margins or improving efficiency (Fridson and Alvarez, 2022).

2.3 Conceptual Framework

This study is conceptualized on the premise that the profitability of cassava production is a function of multiple interconnected variables. The conceptual framework can be visualized as a system where inputs and factors of production (land, labor, capital, management) are transformed through the production process into outputs (cassava roots), which are then sold in markets to generate revenue. Profitability is the outcome of this process, determined by the efficiency of conversion and the relationship between revenue and costs

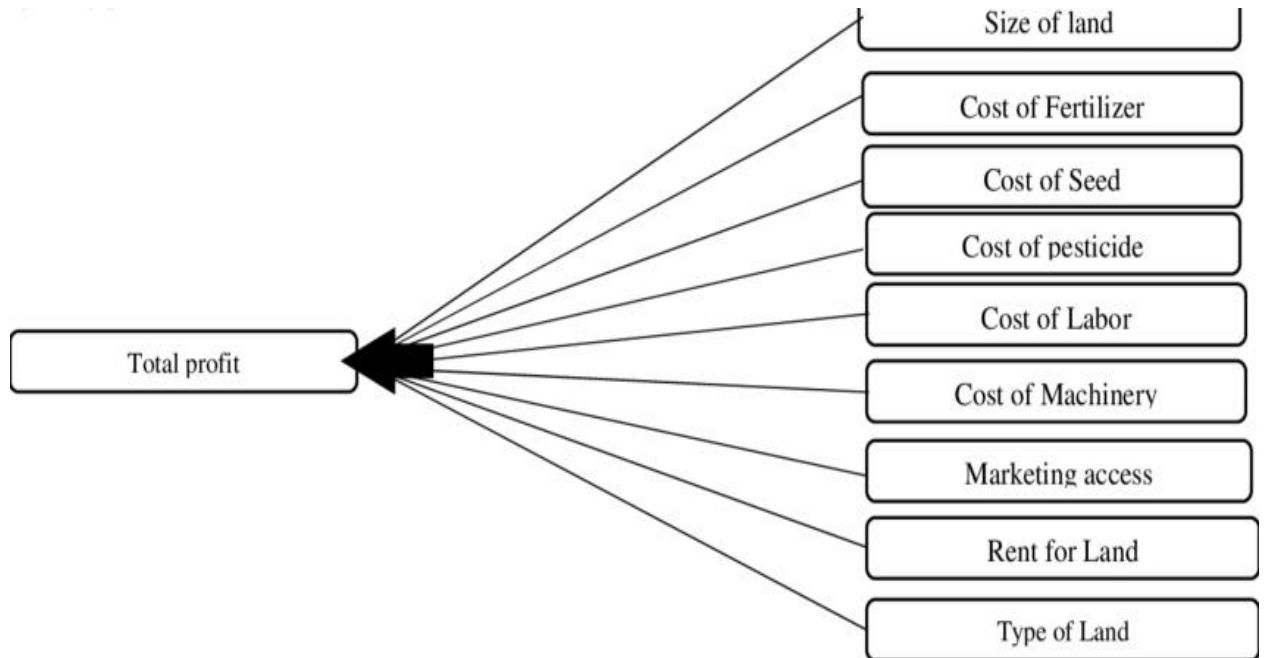


Figure 2.1: Conceptual framework for cassava profitability
Source: Google.com 2025

Profit is the financial gain a firm earns when total revenue exceeds total costs. It is essential for business sustainability, investor returns and economic growth (Hubbard, 2018). There are various theories of profit some of them include: The risk and uncertainty theory which rewards entrepreneurs for bearing unpredictable risks (Knight (1921). Innovation and temporary monopoly profits where firms earn supernormal profits by innovating (Schumpeter, (1934). Market power and monopoly profits where dominant firms earn profits via pricing power, patents or network effects (Robinson, 1933). Cost efficiency and competitive advantage where firms profit by lowering costs or differentiating (Porter, 1985). Firms maximize profit where: $\text{Marginal revenue} = \text{Marginal Cost}$.

2.4 Cassava Production

Cassava plays a crucial role in Nigeria's agricultural economy, supporting millions of livelihoods and contributing to GDP growth. Despite its high production volume, Nigeria's average yield (8 – 12 tons/hectare) lags behind Thailand (20+ tons/hectare) due to:

1. Traditional farming methods - 85% of farmers use manual tools (FMARD, 2023).
2. Limited adoption of improved varieties – Only 40% use high – yield breeds like TME 419 (IITA, 2022).
3. Poor rural infrastructure – 60% of farms lack access to processing facilities (World Bank, 2021).

Government interventions include:

1. 10% cassava flour inclusion policy in bread since 2012 (FMARD, 2021)
2. Anchor Borrower's Programme which disbursed ₦50B to cassava farmers since 2015 (CBN, 2023).

Major challenges include:

1. Post – harvest losses: 40% spoilage due to poor storage (Nigerian stored products research institute, 2022).
2. Disease threats: Cassava mosaic virus reduces yields by 50% in infected fields (IITA, 2023).

3. Market instability: Farm gate or producer prices fluctuate by 300% seasonally (NBS, 2023).

The key interventions include:

1. Cassava Transformation Action Plan (2011 – 2025): Aimed to establish 200 processing plants but only 53 were operational by 2023 (FMARD, 2023).
2. Partnerships with Nestlé: Sourced 25,000 tons of cassava annually for cereal production (Nestlé Nigeria, 2022).

2.4.1 Factors affecting Cassava Production

These include the following:

1. Rainfall Patterns: Cassava requires 1000 – 1,500mm annual rainfall (IITA, 2022). Drought stress reduces yields by 60% in Northern Nigeria (Aina *et al.*, 2023).
2. Soil – fertility: 65% of cassava farms experience nutrient depletion (FMARD, 2023). Low phosphorus availability limits root development (Obigba, 2022).
3. Pests and Diseases: Cassava mosaic disease (CMD) causes 24 – 90% yield loss (IITA, 2023). Mealybug infestations reduce yields by 50 – 80% (Nweke, 2022).
4. Varietal limitations: Only 38% of farmers use improved varieties (NBS, 2023). Local varieties have 50% lower yield potential (IITA, 2022).
5. Farm inputs: 72% of farmers lack access to quality stems (FMARD, 2023). Fertilizer use is <20% among cassava growers (World bank, 2022).

6. Labor constraints: 68% of processing is manual (NBS, 2023). Youth migration reduces farm labor by 15% annually (AfDB, 2022).
7. Production methods: 85% use traditional planting methods (IITA, 2022). Only 12% adopt mechanized harvesting (FMARD, 2023).
8. 40 – 50% losses occur due to poor processing (NSPRI, 2022). <10% of farmers use modern storage (World Bank, 2023).
9. Policy implementation: Only 30% of cassava policy targets are achieved (FMARD, 2023). Credit access is limited to 15% of farmers (CBN, 2022).
10. Market access: 60% of farmers sell to middlemen at low prices (NBS, 2023). Poor rural roads increase transport costs by 40% (AfDB, 2022).

2.5 Analytical Framework

Profitability

Profitability analysis evaluates whether an enterprise generates sufficient returns to justify investments. For cassava farmers, it determines:

1. Economic viability of production systems
2. Optimal pricing strategies
3. Investment decisions (e.g. processing vs. raw sales)
4. Key metric:

$$\text{Net profit} = \frac{\text{Total revenue} - \text{Total Costs}}{\text{Total revenue}} \times 100 \dots \dots \dots \text{eqn.1}$$

(FAO, 2022; IFAD, 2023)

2.5.1 Concept of Profitability

Profitability refers to an organization's ability to generate earnings (profit) relative to its expenses and other costs incurred during a specific period. It measures financial performance by comparing revenues against costs. Key profitability metrics include:

1. $\text{Gross margin} = \frac{\text{Revenue} - \text{Cost of goods sold}}{\text{Revenue}}$ eqn. 2
2. $\frac{\text{Net profit} = \text{Net Income}}{\text{Revenue}}$eqn. 3
3. $\frac{\text{Return on Investment (ROI)} = \text{Net profit} \times 100}{\text{Cost of Investment}}$ eqn 4

Profitability has different dimensions namely: Short – term profitability which includes quarterly and annual profit measurements, Long – term profitability which includes sustained profit generation over the years, Accounting profit which uses explicit costs and Economic profit considers opportunity costs (Hirschey, 2023; Mankiw, 2023).

2.5.2 Profit and Profitability

Profit represents the financial surplus remaining after deducting all expenses from total revenue (Brigham and Ehrhardt, 2022). In agricultural enterprises, profit serves as a critical indicator of sustainability, enabling reinvestment and expansion (FAO, 2023). Three primary tiers of profit are recognized:

1. **Gross Profit:** Revenue minus direct production costs (e.g., seeds, labor). This reflects production efficiency (Horngern *et al.*, 2023).

2. Operating Profit: Gross profit minus indirect expenses (e.g., logistics, administration). It measures operational effectiveness (Mankiw,2023).
3. Net Profit: The final earnings after taxes and interest, representing the “bottom line” (Porter, 2022).

Profitability assesses the efficiency of profit generation relative to resources employed (World Bank, 2023). Unlike absolute profit, profitability is expressed as ratios, enabling cross – scale comparisons (IFAD, 2023). Key metrics include:

1. Gross profit margin: $\text{Gross profit} \div \text{Revenue} \times 100$
2. Net profit margin: $\text{Net profit} \div \text{Revenue} \times 100$
3. Return on investment (ROI): $\text{Net profit} \div \text{Total investment} \times 100$.

CHAPTER THREE

MATERIALS AND METHOD

3.1. Study Area

Edo State is located in southern Nigeria, part of the South-South geopolitical zone with its capital in Benin City. Its geographical coordinates are approximately between latitudes 5°44'N to 7°33'N and longitude 5°40'N to 6°45'E (Nigeria Meteorological Agency, 2006). It was formed on August 27, 1991 from the old Bendel State. It has a total area of 17,802 squared kilometers (6,873 square per mile) with 60% of it being forests including the Okomu National Park, 30% of it is used for agricultural purposes and 10% of it being urban areas like Benin City. It shares direct land boundaries with Ondo State on the west, Kogi State on the north and Delta state on the south. Its eastern border is defined by the Niger River, which separates it from Anambra State on the east and a northeastern portion of Kogi State (National Boundary Commission, 2006).

It was ranked the 20th most populous state in Nigeria as of 2024, the estimated state population is around 5 million with a male population of about 2.55 million (51%) and a female population of about 2.45 million (49%) with a population density of 300-400 people per kilometer squared which also varies by Local Government Area, it has an annual growth rate of 2.7% (aligned with Nigeria's national average), (World Population Review, 2024). It has 18 Local Government Areas; the dominant ethnic groups are; Edo (Bini), Esan, Afemai (Etsako/Owan) and Akoko-Edo (Yoruba

influenced border communities), (Ethnologue Report, 2022). The people of Edo-State engage in various economic activities such as Agriculture, Art and Craft, Civil Service and Education, Mining (Edo State Government, 2019). Edo State has a tropical monsoon climate (Köppen: Am) with distinct wet and dry seasons (Kottek, 2006). It falls within Nigeria's south-south rainforest zone, characterized by high humidity and significant rainfall (NiMet, 2020). It has an annual average temperature of 26°C - 30°C (78°F – 86°F) with the hottest months being February – March (-32°C daytime) and the coolest months being July – August (-22°C at night due to rainfall) (Edo state Agricultural Development Programme, 2018). It has an annual rainfall of 1,500mm – 2,500mm with its rainy season in April – October which peaks in June – September, the dry season starts from November – March which includes the Harmattan winds which occasionally bring dust haze in December – January (Adejuwon, 2004).

This research was conducted in Orhionmwon local government area in Edo State which has its capital in Abudu (administrative headquarters), it was created in 1996 from the old Orhionmwon Ohunmwonde during Nigeria's LGA reforms under the military regime of General Sani Abacha (Edo State Ministry of Local Government Affairs, 2021). It has a land area of 2380 km squared and it is one of Edo state's largest LGAs. It is dominated by rainforests and the Orhionmwon River and has fertile soils that support agriculture (Oil palm, Cassava, Yam). (Edo State Ministry of Local Government Affairs, 2021). It has a lot of major towns and villages namely: 1. Abudu

(Capital) 2. Ugo 3. Evbobanosa 4. Igbanke (Borders Delta State) 5. Ogan. (National Population Commission, 2006).

3.2 Measurement of Variable

To understand how different factors, influence cassava production, this study examines key variables, categorizing them into dependent (outcome) and independent (predictor) variables. Below variable will be explained and measured, ensuring clarity for analysis:

- Dependent Variable:
 1. Cassava Yield (Output): Total harvest per hectare (Kg/Ha).
 2. Profitability: Revenue minus Costs (₦/Ha)
 3. Income: Gross Revenue (₦)
- Independent Variables:
 1. Sex: Male (1) Female (0)
 2. Age: Was measured in number of years
 3. Household size: Was measured in number of people
 4. Education: Will be measured in years
 5. Primary Occupation: Cassava Farming (1) Others (0)
 6. Land size: Farm Area (Hectares)
 7. Labor Input: Cost per man day
 8. Farming Experience: Years in cassava cultivation.
 9. Seed Variety: Was measured in cuttings/Ha

10. Fertilizer Use: Was measured in Kg per Hectares, Inorganic (1) Organic (0)
11. Pesticides/Herbicide: Was measured in Liters
12. Market Access: Distance to the market; 0 – 5km (1 – easy access) 6 – 10km (2 – Moderate access) ≥ 10 km (3 – poor access)
13. Transportation Cost: Cost per bag (₦)
14. Market type: Local village market (1) Urban Market (2) Processor/bulk buyer (3)
15. Rainfall: < 1000 mm (1 – low) 1000 – 1500mm (2 – moderate) ≥ 1500 mm (3 – High)
16. Subsidy Access: Did the farmer receive Government subsidies: No (0) Yes (1)
17. Credit Access: No formal loans (0) Receive Government/ Co-operative loans (1)
18. Co-operative Association: No (0) Yes (1)

3.3 Sampling Procedure

A Two – stage sampling procedure was used; First stage was a purposive sampling of five communities (Abudu, Ugo, Igbanke, Evbobanosa, Ogan) this was based on its agricultural activities particularly the intensive cultivation of tuber crops like yam and cassava. Finally, a simple random sampling of 20 farmers within the selected communities, thus making a sample size of 100 farmers.

3.4 Method of Data Collection

Primary data was collected through a structured questionnaire survey administered to cassava farmers in Orhionmwon lga and a survey was also conducted through face – to – face interviews to ensure clarity and high response rates. Secondary data was obtained from textbooks, journals, articles and the internet etc.

3.5 Data Analysis

1. Objective 1 was achieved using descriptive statistics: such as mean, frequency and percentage was used.
2. Objective 2 was achieved using Budgetary Analysis:

$$G.M = TR - TVC \dots\dots\dots 1$$

Where:

TR = Total revenue

TVC = Total variable cost

GM = Gross margin

$$\text{Net Profit } (\pi) = TR - TC \dots\dots\dots 2$$

Where:

TR = Total Revenue

TC = Total Costs

$$\text{Return on Investment (ROI)} = \frac{\text{Net Profit}}{\text{Total Cost}} \times 100 \dots\dots\dots 3$$

3. Objective 3 was achieved using the regression model:

Using multiple linear regressions (if dependent variable “profit” is continuous):

Model: Multiple Linear Regression Model

$$\text{Profit} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \beta_{17} X_{17} + e$$

Where:

β_0 is the intercept (the baseline where all variables are zero)

X_1 is farm size in hectares

X_2 is labor cost in Naira

X_3 is credit access in Naira

X_4 is yield in Kg

X_5 is market price in Naira

X_6 is cuttings in bundles

X_7 is land rent/lease in Naira

X_8 is cost of fertilizer in Naira

X_9 is cost of pesticides in Naira

X_{10} is cost of depreciation of tools and equipment in Naira

X_{11} is cost of transportation in Naira

X_{12} is activities of middlemen

X_{13} is level of education (In years)

X_{14} is membership of co – operative /union

X_{15} is amount of rainfall

X_{16} is soil fertility

X_{17} is amount of farming experience in years

e is the error term

4. Objective 4 was achieved using the 4 – point Likert scale, where the scale is measured as such:

1..... Not severe constraint

2..... Mildly severe constraint

3..... Severe constraint

4..... Very severe constraint

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

Analysis is done in subsections including socio-economic status of respondents, cost and return structure, regression estimates of factors affecting cassava production and constraints facing respondents in the production of cassava.

4.2 Socio-economic Characteristics of Cassava Farmers in Orhionmwon Local Government Area

4.2.1 Sex of respondents

The results of the study in Table 4.1 reveals a near – equal distribution between male (51%) and female (49%) farmers. This indicates that cassava production in Orhionmwon LGA is not gender – specific and plays a crucial role in the livelihoods of both men and women. This finding aligns with the National Bureau of Statistics (NBS, 2022) report which highlighted the significant involvement of women in Nigeria’s agricultural sector, particularly in root and tuber crop production. It also underscores the pivotal role of women in the agricultural landscape of Nigeria, particularly in food crop production. Historically, women’s contributions have been underestimated, but studies like those by Doss (2018) emphasize that women provide a substantial proportion of the agricultural labor force in the Sub – Saharan Africa and are actively involved in staple crop cultivation. This parity indicates that cassava production in Orhionmwon is not gender – specific and that policies and interventions

must be deliberately inclusive to enhance productivity for all farmers, recognizing the distinct roles and challenges faced by both men and women.

4.2.2 Marital status of respondents

The results of Table 4.1 show that majority of the farmers (61%) were married. This high percentage suggests that cassava farming is predominantly a family – oriented enterprise. Married farmers often have a more stable access to family labor, which is crucial for the labor – intensive stages of cassava production such as weeding, planting and harvesting. As found by Uduji and Okolo (2018) in their study on rural households, marital status often correlates with a higher propensity for long – term investment in agricultural assets, as married individuals tend to have greater household responsibilities and a longer – term outlook on farm sustainability.

4.2.3 Age of respondents

The results of Table 4.1, show that the mean age of the farmers was 42 years, with the largest cohort (28%) falling within the 31 – 40 age brackets. While this indicates a currently active working – age population, the relatively low proportion of farmers below 30 years (21%) is a cause for concern. This aligns with a broader national trend of an aging farming population and reluctance among youth to pursue agriculture, often perceived as less lucrative and more laborious than other sectors. The African Development Bank (2019) has identified this “aging farmer” phenomenon as a significant threat to future food security in Africa, highlighting the urgent need for

policies that make agriculture more attractive and profitable for the younger generation.

4.2.4 Educational status of the respondents

The results of Table 4.1 further reveal that, a highly significant finding was the educational level of respondents, with 91% having some formal education and 39% possessing tertiary education. This is a considerable asset for the agricultural sector. Education enhances cognitive skills, improves the capacity to process technical information, and facilitates the adoption of improved agricultural technologies. As demonstrated by Asante *et al.* (2021), farmers with higher educational attainment were significantly more likely to adopt improved cassava varieties and better soil management practices in Ghana. This high literacy rate in Orhionmwon presents a fertile ground for effective extension services and the dissemination of innovative farming techniques.

4.2.5 Household size of respondents

The results of Table 4.1 indicate the average household size was 5 people. This is consistent with the national average for rural households in Nigeria. A larger household can be a source of readily available family labor, which helps to mitigate the high cost of hired labor, a major component of production costs. However, it also implies higher domestic consumption needs, which can limit the marketable surplus and reduce the income available for reinvestment in the farm enterprise (Olagunju *et al.*, 2021).

4.2.6 Farming experience

The results of Table 4.1 showed that the average farming experience was 10 years, yet a substantial 67% had 10 years or less of experience. This indicates a significant number of relatively new entrants into cassava farming. While this could reflect a growing interest in the crop's economic potential, it also suggests a potential deficit in the depth of experiential knowledge. Experienced farmers typically possess invaluable indigenous knowledge related to local soil conditions, micro – climates and pest management strategies. The prevalence of lower experience levels may be a subtle factor contributing to sub – optimal yields and inefficiencies in resource use (Ojiako *et al.*, 2022).

4.2.7 Farm size of respondents

The results of the Table 4.1 shows that the average farm size was 1.3 hectares. This firmly classifies cassava production in the area as small – scale. Smallholder dominance is a defining feature of Nigerian Agriculture, but it poses significant challenges for achieving economies of scale. As noted by Manyong *et al.* (2021), small and fragmented land holdings limit the potential for mechanization, increase per – unit cost of inputs, and reduce the bargaining power of farmers in the marketplace, often trapping them in a cycle of subsistence production.

4.2.8 Farming status of respondents

The results from the Table 4.1, indicated that the sample was evenly split between part – time (49%) and full – time (51%) farmers. This indicates that for a significant

portion, cassava farming is not the sole source of income. Part – time farmers may engage in other economic activities to diversify their income streams and reduce risk. However, as studied by Olagunju *et al.* (2021), part – time farmers often allocate less time and capital to their farms, which can result in lower productivity and a slower adoption rate for new technologies compared to their full – time counterparts.

Table 4.1: Socio-economic characteristics of respondents

Characteristics	Categories	Freq.	%	Mean
Sex	Female	49	49.00	
	Male	51	51.00	
	Total	100	100.00	
Marital status	Married	61	61.00	
	Single	23	23.00	
	Divorced	3	3.00	
	Widower	10	10.00	
	Separated	3	3.00	
	Total	100	100.00	
Age range (years)	<= 30	21	21.00	
	31 - 40	28	28.00	
	41 - 50	26	26.00	
	51+	25	25.00	
	Total	100	100.00	42
Education	None	9	9.00	
	Primary	17	17.00	
	Secondary	35	35.00	
	Tertiary	39	39.00	
	Total	100	100.00	
Household size range	<= 4	45	45.00	
	5 – 8	51	51.00	
	9+	4	4.00	
	Total	100	100.00	5
Farming experience range (years)	<= 10	67	67.00	
	11 - 20	21	21.00	
	21+	12	12.00	
	Total	100	100.00	10
Farm size range (ha)	<= .5	19	19.00	

	.6 - 1.0	30	30.00	
	1.1 - 1.5	24	24.00	
	1.6+	27	27.00	
	Total	100	100.00	1.3
Farming status	Part-time	49	49.00	
	Full-time	51	51.00	
	Total	100	100.00	

Source; field survey, 2025

4.3 Cost, Returns and Profitability of Cassava Production

4.3.1 Total variable cost (TVC)

Results from Table 4.2 shows that at ₦156,524.14 per farmer, the TVC constitutes the bulk of the total cost. The most striking finding is that labor cost (₦ 121,341.22) accounts for over 61% of the TVC. This overwhelmingly highlights the labor – intensive nature of cassava production. Activities like harvesting (₦24,489.35) and weeding (₦22,289.89) are particularly demanding. This aligns with the work of Ojiako and Asumugha (2022), which identified labor as the single largest cost item in smallholder cassava production systems in Southern Nigeria. The TFC was ₦40,874.76, with land rent (₦31,925.93) being the most significant component. The relatively lower TFC is typical of small – scale agriculture that relies on simple tools like cutlasses and hoes, with minimal mechanization. The TC of production was ₦197,398.90 per farmer per production cycle.

With an average yield of 26.34 bags per farmer sold at ₦10,040 per bag, the TR was ₦264,453.60. The GM of ₦107,929.46 indicates that farmers can cover all their variable costs and have a significant surplus left to contribute to fixed costs and profit. The Net Profit of ₦67,054.70 provides definitive evidence that cassava production in Orhionmwon LGA is a profitable enterprise. This positive return is a strong incentive for continued production and potential investment. The Net Profit Margin of 25.4% is a robust indicator of financial health. It means that for every Naira earned in revenue, the Cassava farmer retains approximately 25.4 Kobo as net profit

after accounting for all production costs. This level of profitability is consistent with findings from other studies in the region, such as Ogunfiditimi and Oke (2021), who have reported similar profit margins for cassava farmers in Southwestern Nigeria.

Table 4.2: Cost, returns and profitability of cassava production

	PER FARMER		PER HA	
	Mean	SD	Mean	SD
1. Variable Cost Items				
Cost - Cassava stem	6,961.00	2,709.24	5,354.62	2,084.03
Cost – Fertilizer	3,580.00	15,546.72	2,753.85	11,959.02
Cost – Herbicide	10,722.50	5,572.16	8,248.08	4,286.28
Cost - Pesticide	4,804.50	4,689.85	3,695.77	3,607.57
Cost - Irrigation			0.00	0.00
Cost - Transportation	5,830.92	2,109.57	4,485.32	1,622.74
Cost - Others	3,284.00	5,573.11	2,526.15	4,287.01
2. Labour Cost Items				
			0.00	0.00
Land clearing cost	16,716.67	7,974.32	12,858.98	6,134.09
Cost - fertilizer application	14,364.29	6,588.29	11,049.45	5,067.91
Cost - Land tillage	17,966.86	7,889.54	13,820.66	6,068.87
Cost – Planting	14,039.44	6,431.69	10,799.57	4,947.45
Harvesting cost	24,489.35	9,421.77	18,837.96	7,247.51
Herbicide application cost	6,378.80	3,972.51	4,906.77	3,055.78
Pesticide application cost	5,095.92	2,606.61	3,919.94	2,005.09
Weeding cost	22,289.89	10,858.41	17,146.07	8,352.62
Cost - Labour (Total)	121,341.22	47,462.33	93,339.40	36,509.49
TVC	156,524.14	55,820.86	120,403.18	42,939.13
2. Fixed Cost Items				
1. depreciated Items				
Cutlass	1,461.27	856.56	1,124.05	658.89
Hoe	1,137.70	603.11	875.15	463.93
Knapsack sprayer	6,349.86	2,205.69	4,884.51	1,696.69
Machinery			0.00	0.00
Depreciated cost	8,948.83	4,359.50	6,883.72	3,353.46
2. Land rent				
	31,925.93	11,384.63	24,558.41	8,757.40
TFC	40,874.76	15,928.56	31,442.12	12,252.74
TC	197,398.90	62,390.11	151,845.31	47,992.39
3. Revenue				
Qty harvest (bags)	26.34	6.48	20.26	4.98
Price per bag	10,040.00	2,259.97	7,723.08	1,738.44
TR	264,453.60	111,224.56	203,425.85	85,557.36
GM	107,929.46	89,266.51	83,022.66	68,666.54
Profit	67,054.70	29,196.59	51,580.54	22,458.92

Computed from field survey, 2025

4.4 Factors Influencing the Profitability of Cassava Production

A multiple regression analysis was conducted to identify the factors that significantly affect profitability. The model was statistically significant (F-value=2.35; $p < 0.01$) and explained approximately 82.7% (Adjusted R-squared =0.827) of the variation in profit, indicating a very good fit.

4.4.1 Farm size (p=0.034)

The results of the study in Table 4.3 reveals that the positive and significant coefficient (₦44,389.20) confirms the presence of economies of scale. Larger farms can spread their fixed costs (like land rent and tools) over a larger output, reducing the cost per unit. This finding, supported by Manyong *et al.* (2021), suggests that policies encouraging land consolidation or cooperative farming could significantly enhance profitability.

4.4.2 Yield (p=0.027)

The results of Table 4.3 shows that the positive coefficient (₦28.27) is both intuitive and critical. It establishes a direct, quantitative link between productivity and profit. Every intervention that increases yield – be it through improved varieties, better agronomy, or pest control – has a direct and measurable payoff. This reinforces the mandate for research and extension systems to focus on yield – enhancing technologies, as championed by IITA (2023).

4.4.3 Cost of fertilizer (p=0.009)

The results of Table 4.3 show that the positive and significant coefficient (₦1.93) is a vital finding. It indicates that money spent on fertilizer is a profitable investment, not just a cost. The resulting yield increases more than compensates for the expense. This debunks any reluctance to invest in soil fertility and provides a strong argument for

credit schemes specifically for input purchase, a point emphasized by the World Bank (2022).

Table 4.3: Regression estimates of factors affecting cassava production

	Coefficient (B)	Std. Error	T value	Prob. level
(Constant)	64174.16	96047.98	0.67	0.507
Farm size (ha)*	44389.20	20456.23	2.17	0.034
Cost - Labor (Total)	0.37	0.29	1.26	0.213
Credit access	18571.82	27659.75	0.67	0.504
Yield*	28.27	12.46	2.27	0.027
Cost - Cassava stem	4.65	4.21	1.10	0.274
Cost - Fertilizer*	1.93	0.72	2.68	0.009
Cost – Herbicide	0.30	2.10	0.14	0.887
Cost – Pesticide	-2.86	2.83	1.01	0.317
Cost - Transportation	3.78	5.49	0.69	0.494
Age (years)	-1963.12	1449.83	1.35	0.181
Education	-23000.40	15390.77	1.49	0.140
Household size (no)	-5755.95	6151.50	0.94	0.353
Farming experience*	3325.25	1736.19	1.92	0.060

F value = 2.35; p<0.01

Adjusted R square = 0.827

Computed from field survey, 2025

4.5 Constraints Facing Cassava Production

Table 4.4 ranks the production constraints faced by farmers based on their perceived severity (using a mean score, where > 2.00 is “serious”). Results from Table 4.4 show that unstable market prices with a mean of 2.80 was the most severe constraint. Price volatility creates uncertainty, discourages investment, and makes it difficult for farmers to plan. This is often a result of gluts during the harvest season and a lack of storage facilities (FMARD, 2023). Results from Table 4.4 revealed that poor access to credit with a mean of 2.74 which is also directly linked to the socio – economic data, this constraint prevents farmers from making the necessary investments to scale up and improve productivity, trapping them in a cycle of low input – low output farming (World Bank, 2022). Results from Table 4.4 reveals that Insufficient funds with a mean of 2.48 is a manifestation of the credit access problem and low profit retention, limiting the farmers’ ability to be self – financing.

4.5.4 High labor cost (Mean= 2.32)

Results from Table 4.4 shows that high labor cost with a mean of 2.32 directly mirrors the budgetary analysis, where labor was the largest cost component. As rural wages rise and youth migrate to urban areas, this constraint is likely to intensify (Nweke *et al.*, 2022). Results from Table 4.4 shows that high cost of

fertilizers/pesticides validates the low usage of these inputs and highlights the need for policies that make them more affordable and accessible to smallholders.

Table 4.4: Constraints facing respondents in the production of cassava

	Mean*	SD
Unstable Market Prices	2.80	.91
Poor Access to Credit	2.74	.96
Insufficient Funds	2.48	.93
High Labor Cost	2.32	.95
High Cost of Fertilizers/Pesticides	2.31	.97
Transportation Constraints	2.19	.88
Pest and Disease Attacks	1.99	.91
Insufficient Land	1.97	.89
Inadequate tools and equipment	1.92	.83
Poor Soil Fertility	1.80	.82
Flooding	1.79	.97
Theft	1.75	.84
Lack of Improved Cassava varieties	1.64	.87
Insecurity on farmlands e.g. herdsmen	1.49	.77
Drought	1.24	.53

**Serious (mean > 2.0)*

Source: Computed from field survey, 2025

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary of the study, the key findings drawn from the analysis, the conclusions reached, and the actionable recommendations for farmers, policymakers and future researchers. The study was centered on the profitability analysis of cassava production in Orhionmwon Local Government Area of Edo State, Nigeria.

5.1 Summary of Findings

The study was guided by four specific objectives. The main findings for each objective are summarized as follows; From the socio-economic characteristics, the average cassava farmer in Orhionmwon LGA is 42 years old, with a near equal gender distribution. Most are married and have an average household of 5 persons. A significant majority has at least a secondary education, and the average farmer has at least 10 years of experience, though have 10 or fewer years, suggesting recent entry into the sector. The average farm size is 1.3 hectares, confirming small – scale, family – based operations, with of farmers using a mix of family and hired labor.

On the cost, returns and profitability of cassava production; the analysis revealed a Total Cost (TC) of production of ₦197,398.90 per farmer cycle. Labor cost was the

most significant expense, constituting over of the Total Variable Cost (TVC) at ₦121,341.22. With an average yield of 26.34 bags sold at ₦10,040 per bag, the Total Revenue (TR) was ₦264,453.60. This resulted in a Gross Margin of ₦107,929.46 and a Net Profit of ₦67,054.70, giving a Net profit margin of 25.4%. This confirms that cassava production in the area is a profitable enterprise.

On the factors influencing the profitability of cassava production; the regression model (Adjusted $R^2 = 0.827$) identified four significant factors namely; Farm size which had a positive and significant effect ($p = 0.034$), indicating that larger farms benefit from economies of scale. Yield had a positive and significant effect ($p = 0.027$), showing that increasing the number of bags harvested directly boosts profit. Cost of fertilizer had a positive and significant effect ($p=0.009$), implying that investment in fertilizer increases yield and profit sufficiently to offset its cost.

On the constraints to cassava production; the most severe constraints (constraints with mean scores > 2.00) were; Unstable market prices with a mean score of 2.80, Poor Access to Credit with a mean score of 2.74, Insufficient funds with a mean score of 2.48, High labor cost with a mean score of 2.32, High Cost of Fertilizers/Pesticides with a mean score of 2.31

5.2 Conclusion

Based on the findings of this study, the following conclusions are drawn:

1. Cassava production in Orhionmwon LGA is a profitable and economically viable enterprise for smallholder farmers, providing a reasonable return on

investment. This underscores the crop's potential as a tool for poverty alleviation and rural development in the region, a point emphasized in Nigeria's Agricultural Promotion Policy (FMARD, 2021).

2. The profitability of cassava farming is not automatic; it is highly dependent on achieving scale and efficiency. The significant influence of farm size and yield on profit highlights that policies and interventions must move beyond mere production to focus on productivity enhancement and operational scale (World Bank, 2022).
3. The dominance of socio-economic and institutional constraints – such as unstable prices, lack of credit, and high input costs – over purely agronomic problems like pests, indicates that the primary barriers to maximizing profitability are related to the market environment and financial systems, not just on – farm practices. This aligns with the African Development Bank's (AfDB, 2023) assessment of the structural challenges in African agriculture.
4. The low adoption of improved varieties and reliance on organic fertilizers reveal a significant technology adoption gap. This gap is a key reason why Nigeria's average yield remains far below its potential, as consistently reported by the International Institute of Tropical Agriculture (IITA, 2023).
5. The heavy reliance of middlemen as the primary buyer places farmers in a weak market position, limiting their ability to capture a fair share of the value

chain's profits, a phenomenon well – documented in Nigerian agricultural markets (Nweke, 2022).

5.3 Recommendations

To enhance the profitability and sustainability of cassava production in Orhionmwon LGA and similar contexts, the following recommendations are proposed;

1. For farmer's and Farmer Cooperatives:
 1. Cluster Farming for Economies of Scale: Farmers should form cooperatives to pool resources, consolidate land, and engage in collective bargaining for inputs and sales. This can help them achieve the economies of scale that the study found to be so profitable (Ojiako and Asumugha, 2022).
 2. Adopt Improved Technologies: Farmers should be encouraged to adopt high – yielding, disease – resistant cassava varieties (e.g., TME 419) and practice integrated soil fertility management, combining organic and inorganic fertilizers for better yields.
 3. Explore Direct Market Linkages: Cooperatives should seek to bypass middlemen by establishing direct supply contracts with processors or accessing urban markets to secure better prices.
2. For Policy Makers (State and Federal Government):
 1. Strengthen Market Information Systems: The government, through the Ministry of Agriculture, should establish a real – time market information

system via mobile phones to reduce price volatility and empower farmers in price negotiations (FMARD, 2023).

2. Facilitate Access to Affordable Credit: Design and implement targeted credit schemes, such as the Anchor Borrower's Programme, with simplified disbursement processes specifically for cassava farmers to invest in inputs and mechanization (CBN, 2023).
 3. Promote Local Input Manufacturing: Provide incentives for the local production of fertilizers and simple processing equipment to reduce costs and improve accessibility for farmers (Okechukwu and Akinbola, 2023).
 4. Invest in Rural Infrastructure: Prioritize the rehabilitation of rural roads in cassava – producing areas like Orhionmwon to reduce transportation costs and post – harvest losses.
3. For Future Researchers:
1. Value Chain Analysis: A detailed study on the cassava value chain in Edo State is recommended to identify specific profit margins at different stages (Farm gate, processing and retail) and pinpoint the most lucrative investment opportunities.
 2. In – depth Study on Credit Constraints: Further research should investigate the specific reasons for the low credit access despite its non – significance in the regression, exploring the roles of collateral, interest rates and financial literacy.

3. Impact Assessment of Government Programs: A study should be conducted to evaluate the direct impact of programs like the Cassava Transformation Action Plan on the productivity and income smallholder farmers in the study area.

In conclusion, while cassava production is currently profitable in Orhionmwon LGA, its full potential is constrained by a combination of limited scale, low technology adoption, and an unfavorable market structure. Addressing these challenges through coordinated efforts from farmers, cooperatives, and the government is essential for transforming cassava from a subsistence staple into a catalyst for sustainable economic growth in the region.

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APPENDIX

DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION SERVICES

FACULTY OF AGRICULTURE, UNIVERSITY OF BENIN, BENIN CITY, NIGERIA

Sir/Madam,

This questionnaire is designed to elicit information on: **Profitability Analysis of Cassava Production in Orhionmwon Local Government Area, Edo State, Nigeria.**

The information you provide will be handled with strict confidentiality and the findings will be used solely for academic purposes. Your responses will be highly appreciated.

ADIGUN Olaoluwa Freda

A. Socioeconomic characteristics

1. Sex: Male [] Female []
2. Marital Status: Married [] Single [] Divorced [] Widow/ Widower [] Separated []
3. Age:
4. Level of Education: No formal education [] Primary [] Secondary [] Tertiary []
5. Household size: Husband [] Wife [] Children [] Others []
6. Years of Experience in Cassava Farming:
7. Farm Size: No. of portions [] No. of acres [] No. of hectares []
8. Nature of Farming: Full time [] Part time []
9. Source of labor: Family [] Hired [] Both []

B. Budgetary/Cost and Returns

Production Costs (Per Hectare)

Variable input	Quantity Used	Cost per unit	Total Cost
Cassava Stems (Meters)	Bundles		
Fertilizer (Kg)	Bags		
Herbicide (Liters)	Liters		
Pesticide (Liters)	Liters		
Others			

Cost of labor for each farm operation

Operations	Amount Paid	No. of portions/cuttings planted	No. of hours/days worked	No. of workers
Land clearing/portion				
Land tillage				
Planting/stem cuttings				
Fertilizer application/portion				
Weeding/portion				
Herbicide application/portion				
Pesticide application/portion				
Harvesting/portion				
Others				
Total				

Fixed Costs for the production period

Fixed inputs Equipment	Number of tools used in the farm	Cost for each tool	Useful life	Depreciated value
Cutlass				
Hoe				
Knapsack Sprayer				
Machinery (If used)				
Total				

Quantity of Cassava harvested/cost

Area	Quantity (25 Kg bags)	Quantity (50 Kg bags)	Cost/bag	Total Cost
Portion				
Acre				
Hectare				

C. Factors Influencing Profitability of Cassava Production

1. Cassava variety planted: Improved Local variety
2. Average yield (Kg/Ha) Last season:
3. Fertilizer Type: NPK Urea Organic
. Cost per hectare: ₦.....
4. Pest/Disease Incidence: None Mild Severe
5. Selling Price per Kg: ₦.....
6. Primary Buyer: Local Market Middlemen Processor/Factory
7. Transportation Cost to Market (₦/Kg):
8. Access to credit: Yes No
9. Rainfall Adequacy: Too Low Adequate Excessive
10. Farming Experience (Years):
11. Use of Irrigation: Yes (Cost: ₦...../Ha) No
12. Soil Fertility Management: Crop Rotation Fertilizer Only None
13. Land Cost: Owned Rented (Cost: ₦...../ Ha)

D. Production Constraints Faced by Cassava Farmers

For each of the following constraints, indicate the level of severity:

Constraints	Not severe	Mildly Severe	Severe	Very Severe
Insufficient Funds				
Insufficient Land				
Inadequate tools and equipment				
Insecurity on farmlands e.g. herdsmen				
Transportation Constraints				
Theft				
High Labor Cost				
Flooding				
High Cost of Fertilizers/Pesticides				
Poor Access to Credit				
Unstable Market Prices				
Pest and Disease Attacks				
Poor Soil Fertility				
Lack of Improved Cassava varieties				
Drought				
Flood				

Other major challenges not listed above? (Specify)

Additional Comments/Suggestions: