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ANALYSIS OF COSTS AND RETURN IN CASSAVA PROCESSING; EVIDENCE OF *GARRI* PRODUCTION IN EKITI LOCAL GOVERNMENT, KWARA STATE, NIGERIA.

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ABSTRACT

This study examines the socio-economic characteristics and financial viability of *Garri* processing in Ekiti Local Government Area, Kwara State, Nigeria. The industry is predominantly female dominated (97.9%), with a significant proportion of married (77.08%) and youthful (29-38 years, 33.33%) processors. However, 65.63% lack access to credit, and 82.29% receive credits of ≤₦100,000/annum. The cost-benefit analysis reveals a lucrative venture, with an average weekly production of 25.5 baskets of cassava roots translating to 1270kg (12.7bags) of *garri*, a gross margin of 28%, and a Return on Investment (ROI) of 38.9%. The total revenue per week (₦646,610.52) surpasses the total cost by ₦181,227.82. The study concludes that *Garri* processing contributes significantly to income generation, employment opportunity and rural development. To enhance its viability, targeted credit facilities, training on technological adoption and financial management, and investment promotion are recommended. These findings inform policymakers, investors, and development practitioners on the industry's potential for economic growth.

Keywords: *Garri* processing, Budgetary analysis, Profitability, Women processor, Ekiti LG

INTRODUCTION

Cassava (*Manihot spp*), a perennial root crop, but often grown and harvested as an annual crop is extensively cultivated in Kwara State, Nigeria, driven by its high demand across Africa and beyond (Anikwe & Ikenganyia, 2018). Renowned for its superior carbohydrate content of 40% compared to 25% in rice and maize, cassava sustains over 300 million Africans. Originating from tropical America and introduced to Africa by the Portuguese in 1558, it has become a cornerstone of food security and income generation, with 80% of Nigerians consuming cassava-based meals daily (Otekunrin & Sawicka, 2019). Despite being the world's largest cassava producer, with an estimated 53 million metric tonnes annually, Nigeria paradoxically spends around $600m yearly on importing cassava derivatives. Moreover, the country's yield per hectare remains relatively low at 8 tonnes, significantly trailing behind other major producers like Brazil and China, which achieve yields of up to 35 tonnes per hectare (CBN, 2024). This disparity highlights the sector's numerous challenges, including poor weed control, high input costs, inadequate storage systems, and exploitative middlemen, which contribute to marketing inefficiencies and stifle growth (Isitor *et al.,* 2016). Also, limited technical expertise in modern *garri* processing, conservative practices among small-scale processors, and restricted access to credit, high costs of mechanization and policy inconsistency further exacerbate these issues (Agbaeze *et al.,* 2020)

Garri, a staple product derived from cassava, remains central to rural livelihoods but is labour intensive and time-consuming to produce, predominantly by women in rural areas (Rufus & Odo, 2018). An inadequacy of detailed socio-economic data on *garri* processors, including their input and output management, impedes the design of effective support programs. Without this important understanding, efforts to optimize resource allocation and enhance the welfare of rural women and farmers are significantly constrained.

This study aims to address these gaps by investigating the socio-economic profiles of *garri* processors, analyzing the costs and profits of *garri* production and also determining the factors that influence the profitability of *garri* processing in the region. The findings will inform practical strategies to improve the efficiency and profitability of cassava processing in Nigeria.

Empirical Literature review

Many studies have looked at the profitability, and challenges with *garri* processing in various areas, therefore offering a spectrum of information. With a gross margin of ₦74,820 per tonne but restricted loan accessibility owing to high interest rates and collateral requirements, Abasilim *et al*. (2019) investigated profitability and credit availability among *garri* processors in Epe, Lagos State. In Ondo State, Aturamu *et al.* (2021) underlined a gross margin of ₦58,300 each processing cycle and underlined market access as a crucial profitability element, therefore advising cooperatives to cut dependency on middlemen. Ibrahim (2022) investigated the Cassava value chain in Ekiti State and found that although high production costs

and restricted technological access hindered efficiency, *garri* processing accounted for 45% of value addition, with women forming 70% of the workforce, Olugbenga *et al.* (2020) observed in Nasarawa State a 60% gain in efficiency with better processing technology but acknowledged financial and infrastructure challenges to their acceptance. Advocating mechanization to increase profitability, Nabay *et al.* (2018) evaluated *garri* processing systems in Sierra Leone and found a profitability ratio of 1.45 with labour costs making half of production expenditures. Measuring technical efficiency in Lagos State, Aminu *et al.* (2017) found a score of 0.72, with inefficiencies linked to out-of-date equipment and uneven power supply, hence advising investments in new facilities. With a gross margin of 82,000 per cycle, Nwahia *et al.* (2024) concluded that *garri* processing in Rivers State is rather profitable and underlined the impact of education and experience on profitability, therefore implying vocational training to raise output. Taken together, these studies highlight the necessity of more technology, greater market access, and better finance facilities to fully realize the *garri* processing industry. Consequently, this present study seeks to analyze costs and returns in cassava processing in Ekiti Local Government Area of Kwara state where cassava is extensively grown.

MATERIALS AND METHODS

Study Area

The research was conducted in Ekiti Local Government Area (LGA) of Kwara State, Nigeria. This LGA, which was created in 1991, covers an area of 480 square kilometers, with its administrative center located in the town of Araromi-Opin. The area is divided into ten wards and includes notable towns such as Osi, Obbo-Ile, Eruku, and Araromi-Opin. The projected population of Ekiti LGA was recorded at 81,700 (Brinkhoff, 2022), with Yoruba as the primary language spoken by its inhabitants. Ekiti LGA's economy is primarily agricultural, engaging 75% of the population, supplemented by trading, artisanship, and civil service. The area's humid tropical climate, characterized by bimodal rainfall (1200-1500mm annually) and mean temperatures (21-32°C), supports extensive cassava cultivation, underpinning its renowned *garri* production industry. Other crops cultivated include yam, kolanut, lettuce, and orange. Geographically, the Local Government lies within latitude 7°46.715'N – 7°05.822'N and longitude 5°08.410'E – 5°01.416'E (KWG, 2020).

Data Collection and Sampling Procedure

This study utilized primary data collected through a well-structured questionnaire to gather information on various aspects of *garri* processing. The questionnaire sought to capture the socio-economic characteristics of respondents, costs of inputs for *garri* processing, quantities of *garri* processed and sold, costs and returns from processing, problems associated with *garri* processing, and factors affecting profitability. A multistage sampling technique was employed to select *garri* processors from the Local Government Area. There are 2 districts and ten wards in the Local Government Area. The sampling process involved three stages. In the first stage, six wards were randomly selected from the ten wards. In the second stage, two villages were randomly selected from each of the six selected wards, resulting in twelve villages all together. Finally, in the third stage, eight *garri* processors were randomly selected from each of the twelve villages, yielding a total of 96 respondents for the study.

Analytical Techniques

Budgetary Analysis (Analysis of Costs and Returns)

Budgetary analysis estimates the financial outcome or profitability of a particular business. This was used to determine the costs and returns to factors of production involved in cassava processing. Ratio will be used to measure the profitability.

GM = TR – (TVC + TFC) .....…….(1)

TR = P × Q ……. (2)

where, GM=Gross Margin

TR = Total Revenue accruable from the sales of cassava products

TVC = Total variable cost incurred in processing e.g. labour, firewood, water, cassava

P = price per unit of processed cassava products.

Q = quantity of processed cassava products.

Rate of return on investment (ROI) = TR/TVC……. (3)

Regression Analysis

Multiple linear regression analysis was used in determining factors influencing the profitability of *garri* processed by the processors in the study area.

The explicit form is stated as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \mu \quad .....(4)$$

Where, Y = Profitability (GM)

X_1 = Cost of Cassava roots (₦/kg)

X_2 = Educational level of processor (years)

X_3 = Age of processor (years)

X_4 = Processing technique (modern 1, otherwise 0)

X_5 = Other processing costs (firewood, transportation, frying pot, knives) (₦)

X_6= Household size (number)

X_7= Experience (years)

β_0= constant term

β_1 ----- β_7 = parameters to be estimated

μ = random error

RESULTS AND DISCUSSION

Socioeconomic Characteristics of *Garri* Processors

Table 1 presents the socio-economic characteristics of *garri* processors, revealing a female-dominated industry with 97.9% of respondents identifying as female and 2.1% as male, consistent with previous findings (Nwahia *et al.*

2024; Aminu *et al.,* 2017). This gender distribution has significant social implications, indicating empowerment of women and economic autonomy, as well as potential challenges in balancing domestic and processing responsibilities. The marital distribution shows 77.08% married, 6.3% single, 3.2% divorced, and 13.7% widowed, highlighting the availability of family labor and social support. Married processors can leverage household members for labor, enhancing production efficiency, and spousal support may alleviate financial and emotional stress. Cassava processing as the primary occupation for 80.21% of respondents underscores its economic significance, contributing substantially to household income. Specialization allows processors to develop expertise, improving productivity. However, 65.63% lack access to credit, indicating financial constraints that hinder investment, expansion, and technological adoption.

The age distribution peaks at 29-38 years (33.33%), suggesting a youthful workforce that brings energy and innovation, potentially increasing productivity. This age group also highlights the importance of succession planning, as older processors can mentor younger ones, ensuring knowledge transfer. Primary education levels (42.7%) may limit technology adoption and constrain business growth, as basic education may hinder understanding of complex processing technologies and impede record-keeping and financial management.

The mean household size of 6 persons (SD=2.1) and 59.38% of households with 5-8 members indicate labor availability and social support. Large households provide additional labor, enhancing production capacity, and household members share responsibilities, alleviating processor burden. The mean years of experience (10.4 years, SD=6.2) and 39.6% with 2-10 years of experience highlight expertise development and knowledge sharing. Processors refine skills through experience, improving quality and efficiency, and experienced processors can train newcomers, promoting industry growth. Financial constraints persist, with 82.29% receiving ≤N100,000/annum and a mean credit amount of N32,419 (SD=23,101), underscoring limited financial resources and economic vulnerability. Processors rely on small-scale credit or personal savings, exposing them to market fluctuations. These findings align with previous studies on the socio-economic characteristics of cassava processors (Adebayo, 2009; Obayelu, 2018), emphasizing the need for targeted interventions to address financial and technological constraints.

Table 1: Socioeconomic Characteristics of Garri Processing Women

Demographic Characteristics	Frequency	Percentage	Mean	S.D
Age (years)				
18-28	9	9.37	42	2.397
29-38	32	33.33		
39-49	21	21.8		
49-58	21	21.8		
59 and above	13	13.9		
Household Size				
2-4	24	25	6	2.609
5-8	57	59.4		
9 and above	15	15.9		
Years of Experience				
2-10	38	39.6	16.03	9.847
11-20	31	32.2		
12-30	22	22.9		
31 and above	5	5.2		
Education Qualification				
0-5	41	42.7	5.92	4.959
6-10	32	33.33		
11-15	23	24.0		
Gender				
Male	3	3.12		
Female	93	96.88		
Marital Status				
Married	75	78.13		
Otherwise	25	21.87		
Processing Technique				
Traditional	89	93.7		
Modern	6	6.3		

Source of credit				
No access	63	65.63		
Others	37	34.37		
Primary occupation				
Cassava processor	77	80.21		
Others	19	19.79		
Credit amount/annum				
0-100,000	89	82.29	32,052.63	71,071.94
110,000-200,000	7			
200,000 and above	4			

Cost and

Returns in *Garri* Processing

Table 2 presents the cost and return analysis of processing cassava into *garri*, revealing a lucrative venture with significant economic and social implications. The weekly production averages 25.5 baskets of cassava roots, translating to 12.7 bags per week, which not only generates substantial revenue but also creates employment opportunities for rural dwellers. The average price of cassava roots stands at ₦260,789.47, while rent and other variable costs (sieving, bagging, transportation, milling, frying, etc.) amount to ₦8,598.25 and ₦192,931.36, respectively.

The total variable cost averages ₦462,382.70, with a depreciated fixed cost of ₦3,063.61, culminating in a total cost of ₦465,382.70. the fixed cost is relatively small as fixed costs are not directly related to production or sales of *garri* but are still relevant to the overall business. Conversely, the average total revenue generated is ₦646,610.52, surpassing the total cost by ₦181,227.82. This substantial revenue gap indicates that *garri* processing is a profitable business, capable of enhancing the livelihoods of processors and contributing to rural development (Adebayo, 2009). Further analysis reveals a gross margin of 28% and a remarkable return on investment (ROI) of 38.9%, underscoring the viability of this venture.

The profitability of *garri* processing has far-reaching implications, including improved food security through increased availability of *garri*, a staple food. Additionally, the industry's potential to generate jobs and income enhances the overall well-being of rural communities. The significant ROI also attracts investors, further stimulating economic growth. These findings align with previous studies on the economic potential of cassava processing (Obayelu, 2018).

Table 2: Cost and Returns in *Garri* Processing

Variable	Amount ₦	Percentage %
Variable costs		
Rent	8,598,25	1.85
Cassava root	260,789.47	56.04
Other variable cost (sieving, bagging, transportation, frying, milling etc)	192,931.36	41.46
Total Variable Cost	462,319.08	99.34
Total fixed cost		
Depreciated costs (fryer, sieve, jack, miller etc)	3063.61	0.66
Total cost	465,382.70	100
Total revenue (PQ *garri* sold)	646,610.52	
Profit (TR-TC)	181,228.52	
Average profit/bag/week	25.5 basket	
Average cassava root processed per week.	12.7bags (1270kg)	
Average bags of *garri* produced per week.		
Profit/basket processed.	₦ 7,107.00	
Profit/bag of *garri*	₦ 14,269.96	
GM=Net profit/TR	0.280	28.0
ROI= Net profit/TC	0.389	38.9

Factors Affecting the Profitability of *Garri* Processing.

The regression analysis results in Table 3 reveal the factors influencing *garri* profitability. The coefficients show that cost of cassava root and other processing costs are significant predictors. Notably, the cost of cassava root has a positive coefficient, suggesting that an increase in its cost leads to an increase in *garri* profitability. This counterintuitive finding may be attributed to factors such as premium pricing of high-quality *garri*, inelastic demand, and favorable market conditions, consistent with studies by Ganiyu and Oyebamiji (2025) and Vihi *et al.,* (2022). In contrast, other processing costs have a negative and significant relationship with profitability (*p=<0.001*), implying that an increase in these costs would lead to a decrease in profitability. This finding aligns with Nwahia et al.'s (2024) study. Other variables, including education, age, processing techniques, household size, and years of experience in processing, have insignificant relationships with profitability.

The model's R^2 value of 0.968 indicates that approximately 96.8% of the variation in profitability can be explained by the predictor variables, demonstrating a strong fit.

Table 3: Factors affecting Profitability of *garri* processing.

Variables	B	S.E	t	Sig
(Constant)	0.379	0.028	13.541	<0.001
Cost of cassava root	1.157E-6	0.000	40.958	<0.001
Education	0-.001	0.001	-0.838	0.405
Age	0.000	0.001	0.690	0.492
Pro. techniques	0.018	0.017	1.051	0.296
Other processing cost	-1.578E-5	0.000	-48.719	<0.001
Household size	-0.002	0.002	-0.902	0.370
Experience	0.000	0.001	0.184	0.855
R^2 =0.968				

CONCLUSION AND RECOMMENDATION

The study concludes that *garri* processing is a viable and profitable business in Ekiti LGA, with significant social and economic implications. The industry is characterized by a female-dominated workforce, youthful processors, and limited access to credit. Despite financial constraints, the cost-benefit analysis reveals substantial revenue generation and employment opportunities. The study further concludes that the cost of cassava root and other processing costs are significant predictors of profitability, while education level, age, processing techniques, household size, and years of experience are not significant factors in determining *garri* profits.

RECOMMENDATIONS

1. The *garri* processors should optimize cassava sourcing by building relationships with local farmers for better prices.

2. They could also negotiate bulk purchases or contracts with suppliers of cassava roots.

3. Monitoring of market trends by keeping eyes on market demand and prices to adjust production and pricing strategies accordingly.

4. Investors should consider the *garri* processing industry as a viable investment opportunity.

REFERENCES

Abasilim, C. F., Balogun, O. L., & Adeyemi, A. A. (2019). Analysis of the profitability and credit accessibility among Garri processors in Epe, Lagos State, Nigeria. Global *Journal of Agricultural Sciences*, 18(1), 57-71. https://www.ajol.info/index.php/gjass/article/download/188601/177855

Adebayo, K. (2009). Dynamics of technology adoption in rural-based cassava processing enterprises in South-West Nigeria. *International Journal of Agricultural Economics and Rural Development*, 2(1):15-25

Agbaeze, E. K., Ohunyeye, F. O., Obamen, J., & Ibe, G. I. (2020). Management of food crop for national development: Problems and challenges of cassava processing in Nigeria. *Sage Journals*, 10(2). https://doi.org/10.1177/2158244020919778

Aminu, F. O., Rosulu, H. O., Toku, A. S. O., Dinyo, O. B., & Akhigbe, E. C. (2017). Technical Efficiency in Value Addition to Cassava: A Case of Cassava-Gari Processing in Lagos State, Nigeria. *Journal of Agriculture and Sustainability*, 10(1), 97-115. https://www.infinitypress.info/index.php/jas/article/download/1515/633

Anikwe, M. A., & Ikenganyia, E. E. (2018). Ecophysiology and production principles of cassava (Manihot species) in Southeastern Nigeria.

Cassava. https://www.intechopen.com/chapters/57031

Aturamu, O. A., Akinbola, A. E., Omosehin, O. O., & Oguntuase, D. T. (2021). Analysis of Profitability and Market Outlets of Smallholder Garri Producers in Ondo State, Nigeria. *Asian Journal of Economics, Business and Accounting*, 21(6), 82-91.

Brinkhoff, T (2022). Kwara (State,-Nigeria)- population statistics, charts. City population. https://www.citypopulation.de

Central bank of Nigeria (CBN)(2024). Central bank of Nigeria, CDI: Cassava. https://www.cbngov.ng

Ganiyu, M. O., & Oyebamiji, I. T. (2025). Analysis of resource utilization for cassava flakes (garri) processing in Ogbomoso ADP Zone, Oyo State Nigeria. *Research Journal of Botany*, 20(1), 7-13. https://doi.org/10.3923/rjb.2025.07.13

Ibrahim, A. T. (2022). Socioeconomic Analysis of Cassava Value Chain in Ekiti State, Nigeria. *International Journal of Advanced Economics*, 4(1), 1-18. https://www.fepbl.com/index.php/ijae/article/view/291/429

Isitor, S.U., Otunaiya, A.O & Iyanda, J.O. (2016). Efficiency of Vegetable Marketing in Peri-Urban Areas of Ogun State, Nigeria. *Journal of Agric. Sci*. 8(3), 109-120

Kwara State Government (KSG)(2020). Local Government Areas. Kwara State Government. https://kwarastate.gov.ng

Nabay, O., Conteh, A., Samura, A., Gboku, M., Koroma, M., Kassoh, F., & Massaquoi, F. (2018). Economic analysis of gari processing systems in Sierra Leone. *Asian Journal of Agricultural Extension, Economics & Sociology*, 26(3), 1-10.

Nwahia, O. C., Elemasho, M. K., Nwebor, E., Aneke, C. C., Ogodo, C. O., Eke, S. I., & Iordekighir, A. C. (2024). Economics Assessment of Garri Processing in Rivers State, Nigeria. *SVU-International Journal of Agricultural Sciences*, 6(3), 80-89. https://svuijas.journals.ekb.eg/article3811266671b0970a0f54cd4330a74a1acd7495.pdf

Obayelu, A.E., Olaleke, P.A., Oke, F.O., & Oladeji, S.A (2018). Economic analysis of cassava processing in Yewa South Local Government Area of Ogun State, Nigeria. *Ife Journal of Agriculture.* Vol.30 (20).

Olugbenga, O. A., Omotayo, A. O., & Ibrahim, M. (2020). Cassava Products Value Chain Analysis among Actors' processors under Traditional and Improved Technologies in Nasarawa State, Nigeria. *Russian Journal of Agricultural and Socio-Economic Sciences,* 104(8), 63-74. https://cyberleninka.ru/article/n/cassava-products-value-chain-analysis-among-actors-processors-under-traditional-and-improved-technologies-in-nasarawa-state-nigeria

Otekunrin, O. A., & Sawicka, B. (2019). Cassava, a 21st century staple crop: How can Nigeria harness its enormous trade potentials. Acta Scientific Agriculture, 3(8), 194-202.https://www.academia.edu/download/60124539/otekunrinandSawickaCassavaarticle2019ASAG-03-058620190726-52773-jl199x.pdf

Rufus Ogbuka, C., & Odo, F. O. (2018). Analysis of Garri Frying Machine Manufacturing in Nigeria: Design Innovation Advances in Science. *Technology and Engineering Systems Journal*, 3(6), 403-411.

Vihi, S. K., Chomini, E. A., Tor, I. G., Jesse, B., Dalla, A. A., Bassey, E. A., & Owu, G. T. (2022). Factors influencing adoption of improved cassava-garri processing technology among rural women in Vandeikya LGA of Benue State, Nigeria. FUDMA *Journal of Agriculture and Agricultural Technology*, 8, 177-188.