



Cassava value chain as instrument for economic growth and profitability in Kwara State Nigeria

BELEWU Kafayat Yemisi^{1,*}, IBRAHIM Hussein Kobe¹, OLANIYAN Abimbola Rokibat¹,
OLUWADARE Olusegun Akinola¹, BELLO Kamoru Atanda², and MUHAMMED Sherifat Mojisola¹

¹ Department of Agricultural Economics and Farm Management, University of Ilorin, Ilorin, Nigeria, PMB 1515

² Al-Hikmah University, Ilorin Kwara State Nigeria

*Corresponding Author; email: belyem9@gmail.com/belewu.ky@unilorin.edu.ng

Phone: (+2348033901883) <https://orcid.org/0000-0002-8474-5274>

Abstract

Cassava is a staple crop widely consumed across African households, with the majority of tubers produced used locally in traditional meals. This study examines the value chain of cassava in Kwara state, focusing on producers, processors, and marketers. Using a multistage sampling technique, data were collected from these key actors and analyzed through descriptive statistics, mean rating analysis, and gross margin calculations. Findings reveal that 75% of cassava farmers are males, while 95% of both processors and marketers are females. Most respondents possess formal education, predominantly at the secondary level. Among producers, mechanization is limited primarily to tractor use, with minimal adoption of other technologies such as planters and harvesters. Processors commonly use traditional tools like graters, pressers, cutters, and pounders, but few have integrated modern equipment like fryers and peelers. Marketers lag further behind in technology adoption; only a small fraction utilize the internet for information access and advertising, and most do not employ packaging logos or improved transportation methods. Economic analysis indicates gross margins of ₦1,020,000 for producers, ₦60,000 for processors, and ₦20,000 for marketers, highlighting cassava farming as the most profitable segment within the value chain. However, respondents face significant challenges including limited access to credit, high labor, input costs, and inadequate extension services. Cassava farming is profitable, processors and marketers require enhanced financial and technical support to increase their profitability. Targeted education on adopting improved technologies, improved access to credit facilities, and strengthened government extension services to provide technical assistance is therefore recommended.

Keywords: Cassava, Economic growth, Profitability, Value chain

1. Background of the study

A value chain encompasses all activities involved in creating a product or service, from initial idea and production through distribution to consumers, and ultimately to its use, disposal, or recycling. This process involves a series of consecutive steps, combining physical transformation and

producer services, that lead to a finished product reaching the customer's door (Roko and Opusunju, 2016). According to Williams *et al.*, (2019), the value chain covers the full lifecycle of a product or process, including material sourcing, production, consumption, and disposal or recycling. It is an integral part of strategic planning for many businesses, involving all processes required to make a product acceptable to consumers (Rushton *et al.*, 2022).

***Corresponding author:** Belewu, Kafayat Yemisi,
Email: belyem9@gmail.com/belewu.ky@unilorin.edu.ng
Received: 21 November, 2025; Accepted: 10 February, 2026; Published online : 28 March, 2026.

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Cassava (*Manihot* spp.), belonging to the family Euphorbiaceae, is the most important root crop cultivated in the Tropics. It is widely grown due to its ease of cultivation and processing, its year-round availability, and its role as a buffer against crop failure (Brown *et al.*, 2026). Cassava requires minimal inputs while yielding relatively well with modest labor. As a warmth-loving crop of the humid tropics, it thrives best at temperatures between 25 and 29°C but performs poorly below 10°C (Omotayo and Oladejo, 2016). The crop needs adequate moisture, ideally an annual rainfall of 1000–2000 mm, although it can tolerate moderate droughts with rainfall as low as 500–750 mm. However, cassava is sensitive to drought immediately after planting. Optimal growth occurs in well-drained, light-textured, deep, and fertile soils, with light sandy loamy soil being ideal. Excessive soil fertility tends to favor shoot growth over root development (Anikwe *et al.*, 2018).

Nutritionally, cassava is a starchy root vegetable rich in carbohydrates but low in protein and other nutrients. It serves as a staple food in areas where other crops struggle to grow, providing dietary fiber, vitamin C, and minerals. However, cassava contains naturally occurring cyanide compounds that can be toxic if not properly processed and cooked (Bayata, 2019; Mombo *et al.*, 2017).

Globally, cassava is a staple for millions, particularly in Africa, Asia, and South America. Africa leads in production, with Nigeria as the largest producer, accounting for 35% of Africa's production and 19% globally. Other major producers include Thailand, Democratic Republic of Congo, Indonesia, Brazil, Ghana, Angola, Tanzania, Cambodia, and Mozambique, collectively producing about 75% of the world's cassava (Aso *et al.*, 2018). In sub-Saharan Africa, it is the second most important calorie source after maize, vital to food security and livelihoods of millions of small-scale farmers (Aso *et al.*, 2018).

In Nigeria, cassava is a major staple food especially in southern and central regions, with annual production exceeding 50 million tonnes (Nanbol and Namo, 2019). Planting typically

aligns with the rainy season to ensure sufficient soil moisture; February to August in southern Nigeria and May to October in northern Nigeria (Obidiegwu and Akpabio, 2017). Two main cassava varieties are cultivated: sweet (non-toxic) and bitter. Sweet cassava, preferred for household consumption, is used to make foods like garri and fufu, while bitter cassava, high in cyanide, requires proper processing and is often used industrially for ethanol production. Maturation spans 10-12 months for sweet varieties and 12-18 months for bitter ones (Ifeabunike *et al.*, 2017; Kaur and Ahluwalia, 2017).

Ideal planting temperatures in Nigeria range from 25°C to 35°C, with cassava capable of growing year-round given adequate water and sunlight. Temperatures outside this range, especially below 20°C or above 40°C, can impair growth and reduce yield and tuber quality (De Souza *et al.*, 2017; Brown *et al.*, 2016).

Kwara State, in Nigeria's North Central region, is a key cassava-growing area due to its warm climate (28 to 32°C), bimodal rainfall (1,200 mm annually), and tropical humidity conditions favorable for cassava cultivation. The state's rainfall pattern and soil conditions support optimal cassava growth (Olayinka *et al.*, 2016).

The cassava value chain typically starts with small-scale farmers who cultivate cassava, followed by harvesting and transport to processing facilities where roots are cleaned, peeled, and grated. Processors then convert grated cassava into products like flour, starch, and chips, which are distributed by marketers to wholesalers, retailers, and ultimately to end-users such as food manufacturers, households, and animal feed producers (Amelework *et al.*, 2021). Value chain analysis for cassava enhances understanding of marketing operations from production through to consumption, helping farmers select efficient marketing channels and distribution networks to maximize profitability. It examines the flow of cassava produce from production points through distribution to final consumers (Darko-Koomson *et al.*, 2020). The cassava value chain in Kwara State is constrained

by subsistence production, low-yield varieties, high post-harvest losses, rudimentary processing, limited finance, poor infrastructure, weak market linkages, price volatility, and gender-specific barriers, despite cassava's importance as a staple and industrial crop.

The cassava value chain in Kwara State, Nigeria, is constrained by subsistence production, low-yield varieties, high post-harvest losses, rudimentary processing, limited finance, poor infrastructure, weak market coordination, and gender-specific barriers, resulting in low productivity, low incomes, high consumer prices, and limited industrial value addition. A key issue is the short shelf-life of fresh cassava produce, causing significant losses for farmers, processors, and marketers. Another major challenge is limited access to technologies that could boost productivity throughout the cassava value chain. Addressing these challenges requires a comprehensive analysis of the cassava value chain to identify obstacles and opportunities, involving collaboration among stakeholders including farmers, processors, traders, legislators, and development organizations to enhance efficiency, effectiveness, and the resilience of cassava-dependent livelihoods. This context sets the stage for research questions aimed at closing the gaps in cassava value chain performance. The study is therefore set to determine the level of traditional and improved technologies utilized by farmers, processors, and marketers in the value chain of cassava, analyze the costs and returns on activities involving farming, processing, and marketing in the value chain of cassava and describe the constraints faced by respondents along the value chain of cassava in the study area.

2. Materials and Methods

2.1. Study Area

The study was conducted in Kwara State, located in Western Nigeria. It shares borders with Kogi State to the east, Niger State to the north, Ekiti, Osun, and Oyo states to the south, and its western boundary forms part of the international border with Benin Republic. The state's capital city is

Ilorin, and it is divided into 16 local government areas.

Kwara State experiences a tropical wet and dry climate, with annual rainfall ranging from approximately 990.3 mm to 1318 mm. Temperatures in the state fluctuate between 33°C and 37°C, with March being the hottest month of the year. Between 1978 and 2017, both minimum and maximum temperatures, as well as relative humidity in Ilorin, have shown an upward trend. The region is influenced by both South-East and North-East continental winds. Geographically, Kwara lies between latitudes 8° and 16° North and longitudes 3° and 6° East.

The geology of Kwara is primarily composed of pre-Cambrian basement complex rock. The soil, especially around Ilorin, is well-suited for growing cereal crops and vegetables. The vegetation is typical of derived savanna and includes grasses like spear grass, elephant grass, and goat weeds, alongside trees such as acacia, shea butter, and locust beans (Ajadi and Adeniyi, 2017).

Agriculture dominates the livelihoods of the population, with most residents engaged in farming. Major food crops grown in the area for local consumption include maize, rice, sorghum, millet, beans, yam, cassava, guinea corn, and various vegetables (Ajadi and Adeniyi, 2017).

2.2. Sampling Techniques and Method of Data Collection

A multi-stage sampling technique was used for collecting the data. In the first stage, there is a random selection of three (3) local government areas from Zone C in Kwara State. The second stage also involves the random selection of four (4) villages each from the three local government areas, while the third stage is the random selection of farmers, processors, and marketers of cassava in all the villages. A total number of one hundred and twenty (120) actors were randomly selected. This includes 40 cassava farmers, 40 cassava processors (*lafun*, *fufu*, *garri*), and 40 cassava and cassava produce marketers.

2.3. Method of Data Analysis

Based on the objectives stated many econometric approaches were used to examine the collected data. Descriptive statistics, gross margin analysis, and mean rating analysis (Likert-type scale) are among the analytical techniques employed.

2.4. Model Specification

Mean rating analysis

The mean rating analysis will be employed and to determine the most used technology (traditional/improved) by respondents. It will be used also to find out how farmers and processors felt about the problems and constraints they encountered. The response options and values to be assigned are as follows: highly agree = 1, agree = 2, uncertain = 3, disagree = 4, and strongly disagree = 5. The mean score for the study would be calculated using:

$$MS = \frac{\sum(RP \times O)}{\sum F}$$

Where MS = Mean Score (units), RP = Rating Point (units), O = Observations (units), $\sum F$ = Total Number of Sampled Respondents (units).

This will be used to achieve part of objectives two (2) and four (4).

Gross margin analysis

This is the difference between the observed gross farm income (GFI) and total variable cost (TVC). It will be used to determine the profitability of cassava production and processing. The tools will be used to achieve objective three (3).

The gross margin model (GM) is given as:

$$GM = TR - TVC$$

Where GM = Gross Margin (#), TR = Total Value of Output or Total Revenue (#), and TVC = Total Variable Cost (#).

3. Results and Discussions

3.1. Socio Economics Profile of Respondents

Table 1 reveals that the majority of farmers (75%) were male, while females accounted for only 25%, highlighting a significant gender disparity

with men predominantly managing farms as heads of farming households. This aligns with Akerele *et al.*, (2019), who noted that gender influences the ability to perform certain physical tasks. The lower involvement of women in cassava farming may be due to perceptions of the work being more physically demanding. Conversely, cassava processing is overwhelmingly dominated by women, who make up 95% of processors, with males representing just 5%. This finding is consistent with Falola *et al.* (2022), which identifies females as the primary actors in cassava processing. Similarly, women also lead in cassava product marketing, comprising 95% of marketers compared to 5% males. This reflects the significant role of women in the value addition and marketing stages of the cassava value chain and corroborates Agada *et al.* (2018), who reported greater female participation in marketing activities.

The predominance of male farmers in cultivation is likely linked to traditional gender roles favoring men in agricultural leadership, while female dominance in processing and marketing corresponds with the nature of these activities being more aligned with women's roles in value addition.

Age distribution shows that 75% of farmers are aged 41 and above, indicating that cassava farming is mainly undertaken by individuals in their active, productive years. This supports Onubuogu *et al.* (2014), who found that farmers aged 40-50 are more receptive to innovation and better able to handle the physical demands of farming, contributing to improved efficiency and resilience in cassava production. Younger farmers aged 26-30 and 21-25 constitute 20% and 5% respectively, signaling limited youth engagement in farming.

Among processors, the largest group (57.5%) falls within the 26-30 age range, showing that cassava processing is common among economically active individuals, which Elegbede *et al.* (2019) also observed. Additionally, 30% of processors are aged 31-40, while only 2.5%

belong to the 21-25 age group, indicating very few young people are involved in processing.

Similarly, cassava marketing is dominated by those aged 26-30 (55%), followed by 31-40-year-olds (30%), while just 7.5% of marketers are in the 21-25 age bracket. The lower participation of the youngest group may be because many do not yet own businesses and often depend on family enterprises for their involvement in marketing.

All the farmers surveyed were married, indicating that cassava farming in the study area is predominantly a family-based activity involving married individuals supporting their households (Akerle *et al.*, 2019). Similarly, most processors (92.5%) and marketers (90%) are married, though a small percentage of processors and a slightly higher proportion of marketers are single, suggesting that marketing roles may attract more unmarried individuals due to greater flexibility.

Household sizes vary among the groups: 75% of farmers have medium-sized households (6-10 members), 62.5% of processors have smaller households (≤ 5 members), and 70% of marketers also have smaller households. Larger households among farmers and processors may provide more labor for farming activities, while smaller households among marketers might focus more on value addition and marketing strategies (Akerle *et al.*, 2019).

Educational backgrounds differ across the value chain. A large portion of farmers have non-formal (42.5%) or secondary education (42.5%), with 12.5% attaining tertiary education. Among processors, most have primary (40%) or secondary education (22.5%), with none having tertiary education, which may limit their adoption of advanced processing technologies (Falola *et al.*, 2022). Marketers predominantly have secondary education (52.5%), with smaller percentages having non-formal, primary, or

tertiary education. This diversity in education impacts their approaches to farming, processing, and marketing (Ajayi and Olutumise, 2018).

All farmers, processors, and marketers surveyed are primarily engaged in their respective cassava activities, with sample sizes of 40 individuals each. Among farmers, 35% belong to associations providing farm inputs, whereas 92.5% of processors belong to associations mainly for credit access, and 72.5% of marketers are members of associations, demonstrating varied levels of collective organization.

Regarding profitability, 52.5% of farmers report sufficient returns, while 47.5% are dissatisfied, often challenged by costs like transportation and market access (Martey *et al.*, 2012; Donkor *et al.*, 2018). Processors enjoy higher satisfaction, with 95% reporting adequate returns, reflecting better value addition and market positioning (Omotayo and Oladejo, 2016). Marketers show mixed results, with 67.5% satisfied and 32.5% unsatisfied, highlighting challenges in marketing efficiency and competition.

Capital sources vary by role: savings are common for 50% of farmers, 12.5% of processors, and 30% of marketers. Processors primarily use bank loans (75%) due to higher capital needs, while smaller proportions of farmers and marketers rely on loans. Cooperatives and friends also provide funding, reflecting diverse financing strategies along the value chain (Okoruwa *et al.*, 2020).

Experience levels indicate that most actors have moderate experience: 52.5% of farmers, 65% of processors, and 60% of marketers have 4-6 years in their activities, with smaller proportions being either new (< 3 years) or experienced (> 6 years). Experience correlates with better management and decision-making capabilities in cassava value chain activities (Akerle *et al.*, 2019).

Variables	FARMERS		PROCESSORS		MARKETERS	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Gender						
Male	30	75	2	5	2	5
Female	10	25	38	95	38	95
Total	40	100	40	100	40	100
Age						
21-25 years	0	0	1	2.50	3	7.50
26-30 years	2	5.00	23	57.50	22	55.00
31-40 years	8	20.00	12	30.00	12	30.00
41 and above years	30	75.00	4	10.00	3	7.50
Total	40	100.00	40	100.00	40	100.00
Mean	45		30		30	
Marital status						
Single	0	0	3	7.50	4	10.00
Married	40	100	37	92.50	36	90.00
Total	40	100	40	100	40	100.00
Household size						
≤ 5	10	25	25	62.50	28	70
6-10	30	75	15	37.50	12	30
Total	40	100	40	100.00	40	100
Mean	7.5		4.3		4.5	
Level of education						
Non- formal	17	42.50	15	37.50	7	17.50
Primary	1	2.50	16	40.00	7	17.50
Secondary	17	42.50	9	22.50	21	52.50
Tertiary	5	12.50	0	0	5	12.50
Total	40	100.00	40	100.00	40	100.00
Primary occupation						
Farming	40	100	0	0	0	0
Processing	0	0	40	100	0	0
Marketing	0	0	0	0	40	100
Total	40	100	40	100	40	100
Association membership						
Yes	14	35	37	92.5	29	72.50
No	26	65	3	7.50	11	27.50
Total	40	100	40	100.00	40	100.00
Enough returns from sales						
Yes	21	52.50	38	95.00	27	67.50
No	19	47.50	2	5.00	13	32.50
Total	40	100.00	40	100.00	40	100.00
Source of capital						
Cooperatives and savings	1	2.50	0	0	0	0
Savings	20	50.00	5	12.50	12	30.00
Cooperatives	10	25.00	3	7.50	10	25.00
Bank loan	3	7.50	30	75.00	13	5.00
Friends	3	7.50	2	5.00	2	32.50
Friends and savings	3	7.50	0	0	3	7.50
Total	40	100.00	40	100	40	100.00
Years of experience						
≤3	7	17.50	3	7.50	5	12.50
4-6	21	52.50	26	65.00	24	60.00
Above 6	12	30.00	11	27.50	11	27.50
Total	40	100.00	40	100.00	40	100.00
Mean	4.5		5.0		4.7	

Table 1. Socio-economic Characteristics of the Respondents

	FARMERS		PROCESSORS		MARKETERS	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Traditional	29	72.50	27	67.50	30	75.00
Improved	11	27.50	13	32.50	10	25.00

Source: Authors survey 2023

Table 2. Level of traditional or improved technologies adopted by respondents

Source: Authors survey 2023

3.2. Level of traditional or improved technologies adopted by respondents

From Table 2 and Figure 1, it is evident that the majority of farmers (72.5%) rely on traditional technologies in their cassava farming, while only 27.5% have adopted improved practices.

Similarly, the table reflects that most processors (67.5%) also use traditional processing methods, with 32.5% adopting improved technologies. In the marketing sector, traditional technology use is most prevalent, with 75% of marketers relying on conventional methods. Only 25% have adopted improved technologies, predominantly internet use.

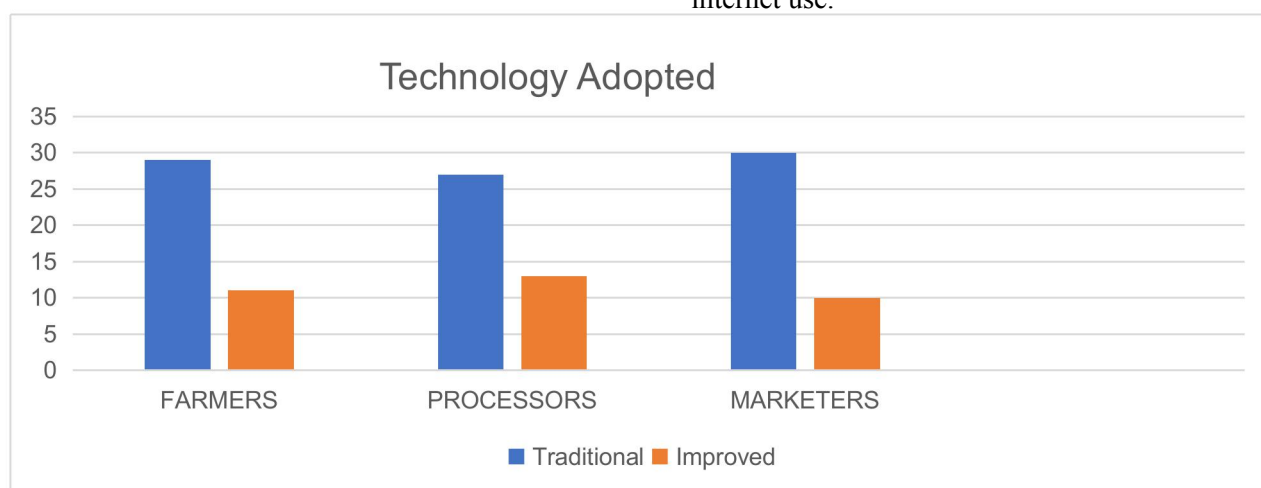


Figure 1. Graphical Representation of Technology Adopted

Source: Authors survey 2023

3.3. Number of technologies adopted

Table 3 shows that among cassava farmers, 11 have adopted the tractor as an agricultural technology, while no farmers have adopted the planter and harvester technologies. This indicates that tractor use is somewhat prevalent, likely due to its utility in land preparation and possibly the availability or affordability of tractors compared to planters and harvesters. The absence of planter and harvester adoption may be due to factors such as cost, accessibility, lack of awareness, or unsuitability of these technologies for local farming practices. The number of technologies adopted by cassava processors varies, with some technologies being more popular than others.

About 13 cassava processors adopted the Grater technology, 13 processors adopted the Presser technology. The Cutter technology was adopted by 7 processors, while 12 processors adopted the Pounder technology. Notably, no processors adopted the Fryer and Peeler technologies. Among cassava marketers, the adoption of technologies shows a clear preference pattern.

10 marketers have adopted the use of the Internet as a technology for their marketing activities. In contrast, only 2 marketers have adopted transportation means technology to aid in their marketing efforts. Notably, no marketers have adopted the use of package logos technology.

FARMERS	
Variables	Adoption
Tractor	11
Planter	0
Harvester	0
PROCESSORS	
Variables	Adoption
Peeler	0
Grater	13
Presser	13
Fryer	0
Cutter	7
Pounder	12
MARKETERS	
Variables	Adoption
Use of Internet	10
Package logo	0
Transportation means	2

Table 3. Number of Technologies Adopted

Source: Authors survey 2023

Figure 2 further show that the primary improved technology adopted by farmers is the use of tractors. Although many farmers are aware of other technologies such as planters and harvesters, adoption remains low due to factors like lack of knowledge and high costs. This indicates that most farmers continue to use conventional methods, with only a smaller group embracing modern techniques, largely hindered by expenses, unavailability, and lack of awareness (Ngozi *et al.*, 2022). Commonly used improved equipment among processors includes graters, pressers, cutters, and pounders, while peelers and fryers are yet to be widely adopted, largely because manual labor remains inexpensive for these tasks.

The limited uptake of certain technologies is attributed to high equipment costs, inadequate technical knowledge, lack of availability, and insufficient extension service support. These findings align with Ehinmowo and Fatuase (2016), who reported that although cassava processors are aware of modern technologies, full adoption remains limited. Marketers have largely not embraced innovations like branded packaging or advanced transportation methods that could prolong cassava's shelf life and enhance profitability, possibly due to limited awareness or access. This reflects marketers' intermediary role, where they may have less influence over production and processing technologies.

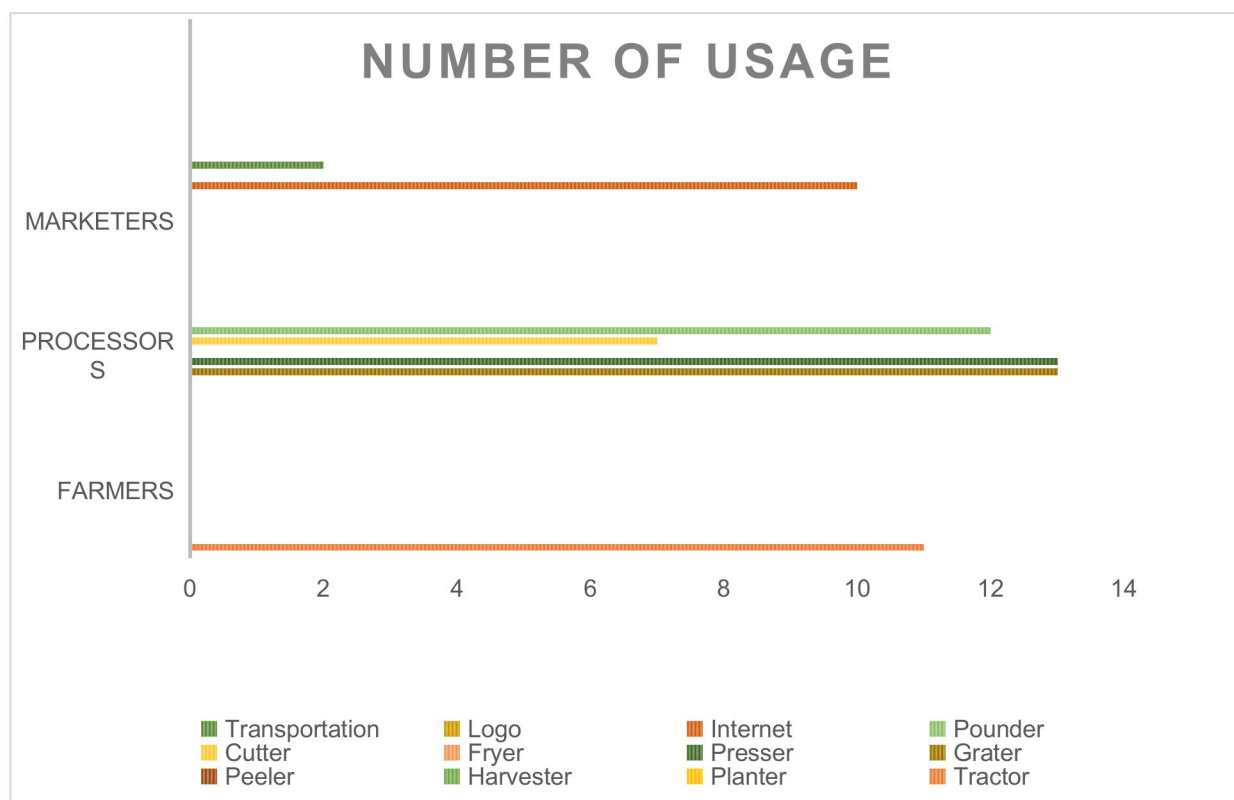


Figure 2. Number of Technologies Adopted.

Source: Authors survey 2023

3.4. Costs and returns of respondents

Table 4 presents the gross margin of respondents across the cassava value chain in the study area, detailing their total variable costs and revenue per production season.

Farmers earn an average total revenue of ₦1,320,000 per production season, with average variable costs of ₦300,000. This results in a gross margin of ₦1,020,000, indicating that the revenue from production sufficiently covers the variable costs. However, this does not account for fixed costs. The positive gross margin suggests that cassava farming is profitable in the study area. This is supporting the research of Donovan *et al.* 2015, where they confirm that cassava production is profitable in their study area.

For processors (garri, lafun, and fufu), the average total variable cost per production period

is ₦90,000, with an average total revenue of ₦150,000, yielding a gross margin of ₦60,000. This shows that processors are also profitable but earn less compared to farmers.

Marketers have an average total revenue of ₦90,000 and incur variable costs of ₦70,000, resulting in a gross margin of ₦20,000. This is relatively low compared to both farmers and processors.

Overall, farmers earn the highest profit, followed by processors, with marketers earning the least. This contrasts with Donkor *et al.* (2022), where processors and marketers made the highest profits, leaving farmers with the least. The difference may be due to the scale of operations; in this study, processors and marketers are mostly small-scale and lack the economies of scale that medium and large-scale operators benefit from. Additionally, manual production methods limit output and profitability for these groups.

FARMERS		PROCESSORS		MARKETERS	
Variables	Amount(₦/ha)	Variables	Amount (₦)	Variables	Amount (₦)
Total revenue	1,320,000	Total revenue	150,000	Total revenue	90,000
Variable costs		Variable costs		Variable costs	
Cost of cassava cuttings	50,000	Cost of cassava	60,000	Cost of produce	41,500
Fertilizer	65,000	Cost of jacking/pressing	10,000	Cost of transportation	16,500
Herbicide	40,000	Cost of labour	15,000	Cost of packaging	5,000
Equipment	50,000	Transportation	5,000	Cost of labour	7,000
Transportation	45,000				
Cost of labour	50,000				
Total variable costs	300,000	Total variable costs	90,000	Total variable costs	70,000
Gross margin (GM) = TR – TVC					
GM =1,020,000		GM =60,000		GM =20,000	

Table 4. Costs and Returns of Respondents

Source: Authors survey 2023

3.5. Constraints faced by respondents along the value chain of cassava

The constraints in the cassava value chain were assessed using a five-point Likert scale, revealing distinct challenges faced by farmers, processors, and marketers.

Farmers identify the unavailability of land or high rent cost as their most serious constraint, followed by the high cost of inputs, pest incidence and lack of quality planting materials. Other notable issues include poor storage facilities, limited access to credit, pests and diseases, low product prices, and the high cost of labor. Some constraints like theft and inadequate buyers are less serious for farmers. This supports the findings of Darko-Koomson *et al.* 2020 where producers cost of inputs, limited access to credits among other were the major problem in their study area.

Processors experience major challenges with high input costs, labor expenses, poor storage facilities, and limited access to credit. Land

availability, and theft are generally not major concerns for them, while extension services and water supply show moderate impact. This is inline with report of Brown *et al.* 2016 with processors have the problems like poor storage facilities and lack of modern processing technologies.

Marketers face the most significant constraint in inadequate access to credit, followed by high input costs, labor costs, and poor marketing facilities. Issues such as land rent, buyers, pests, theft, and quality planting materials are generally less problematic for marketers. This is conformity with findings of Donkor *et al.* 2028 in which major marketers' problems include poor marketing facilities and price fluctuation.

Overall, farmers primarily struggle with land access, planting materials, and credit; processors with credit, input, and labor costs; and marketers with credit, input costs, labor, and marketing infrastructure. While some constraints are shared, each group also faces unique challenges related to their specific roles in the cassava value chain.

Table 5. Constraints faced by respondents along the cassava value chain

Constraints	FARMERS					Mean	Rank
	Very serious	Serious	Moderately serious	Less serious	Not serious at all		
High cost of input	14(35.00)	8(20.00)	8(20.00)	6(15.00)	4(10.00)	3.55	2 nd
High cost of hiring labor	10(25.00)	6(15.00)	3(7.50)	4(10.00)	17(42.50)	2.70	8 th
Poor storage facilities	9(22.50)	9(22.50)	12(30.00)	5(12.50)	5(12.50)	3.30	4 th
Inadequate access to credit facilities	5(12.50)	17(42.50)	8(20.00)	4(10.00)	6(15.00)	3.28	5 th
Unavailability of land/high cost of rent	10(25.00)	22(55.00)	3(7.50)	2(5.00)	3(7.50)	3.85	1 st
Inadequate buyers	0(00.00)	7(17.50)	11(27.50)	10(25.00)	12(30.00)	2.33	10 th
Incidence of pests/diseases	2(5.00)	13(32.00)	17(42.00)	3(7.50)	5(12.50)	3.10	6 th
Lack of quality planting materials	3(7.50)	26(65.00)	4(10.00)	3(7.50)	4(10.00)	3.53	3 rd
Incidence of theft	0(00.00)	1(2.50)	8(20.00)	8(20.00)	23(57.50)	1.68	13 th
Poor extension services	0(00.00)	6(15.00)	12(30.00)	9(22.50)	13(32.50)	2.28	11 th
Insufficient water supply	2(5.00)	2(5.00)	12(30.00)	17(42.50)	7(17.50)	2.38	9 th
Poor marketing facilities	1(2.50)	4(10.00)	7(17.50)	18(45.00)	10(25.00)	2.13	12 th
Low cost of produce	1(2.50)	14(35.00)	15(37.50)	3(7.50)	7(17.50)	2.93	7 th

Source: Authors survey 2023

Constraints	PROCESSORS					Mean	Rank
	Very serious	Serious	Moderately serious	Less serious	Not serious at all		
High cost of input	6(15.00)	20(50.00)	10(25.00)	2(5.00)	2(5.00)	3.65	2 nd
High cost of hiring labor	7(17.50)	13(32.50)	2(5.00)	3(7.50)	15(37.50)	2.85	3 rd
Poor storage facilities	4(10.00)	11(27.50)	7(17.50)	4(10.00)	14(35.00)	2.68	5 th
Inadequate access to credit facilities	14(35.00)	19(47.50)	1(2.50)	1(2.50)	5(12.50)	3.95	1 st
Unavailability of land/high cost of rent	0(00.00)	4(10.00)	6(15.00)	6(15.00)	24(60.00)	1.75	10 th
Inadequate buyers	0(00.00)	0(00.00)	15(37.50)	6(15.00)	19(47.50)	1.90	8 th
Incidence of pests/diseases	0(00.00)	1(2.50)	2(5.00)	6(15.00)	31(77.50)	1.33	11 th
Lack of quality planting materials	0(00.00)	0(00.00)	0(00.00)	6(15.00)	34(85.00)	1.15	13 th
Incidence of theft	0(00.00)	0(00.00)	3(7.50)	4(10.00)	33(82.50)	1.25	12 th
Poor extension services	0(00.00)	1(2.50)	17(42.50)	1(2.50)	21(52.50)	1.95	7 th
Insufficient water supply	1(2.50)	15(37.50)	6(15.00)	8(20.00)	10(25.00)	2.73	4 th
Poor marketing facilities	0(00.00)	1(2.50)	8(20.00)	14(35.00)	17(42.50)	1.83	9 th
Low cost of produce	0(00.00)	6(15.00)	17(42.50)	12(30.00)	5(12.50)	2.60	6 th

Source: Authors survey 2023**continued**

Table 5: continued

Constraints	MARKETERS					Mean	Rank
	Very serious	Serious	Moderately serious	Less serious	Not serious at all		
High cost of input	12(30.00)	11(27.50)	10(25.00)	4(10.00)	3(7.50)	3.63	2 nd
High cost of hiring labor	7(17.50)	3(7.50)	3(7.50)	8(20.00)	19(47.50)	2.28	6 th
Poor storage facilities	8(20.51)	4(10.26)	4(10.26)	7(17.95)	16(41.03)	2.51	5 th
Inadequate access to credit facilities	17(42.50)	10(25.00)	5(12.50)	1(2.50)	7(17.50)	3.70	1 st
Unavailability of land/high cost of rent	3(7.50)	3(7.50)	2(5.00)	3(7.50)	29(72.50)	1.70	9 th
Inadequate buyers	1(2.50)	3(7.50)	12(30.00)	8(20.00)	16(40.00)	2.13	7 th
Incidence of pests/diseases	1(2.50)	3(7.50)	1(2.50)	6(15.00)	29(72.50)	1.53	10 th
Lack of quality planting materials	0(00.00)	1(2.50)	1(2.50)	5(12.50)	23(82.50)	1.30	13 th
Incidence of theft	0(00.00)	1(2.50)	3(7.50)	6(15.00)	30(75.00)	1.38	12 th
Poor extension services	1(2.50)	1(2.50)	15(37.50)	4(10.00)	19(47.50)	2.03	8 th
Insufficient water supply	0(00.00)	3(7.50)	3(7.50)	4(10.00)	30(75.00)	1.48	11 th
Poor marketing facilities	1(2.50)	3(7.50)	22(55.00)	7(17.50)	7(17.50)	2.60	4 th
Low cost of produce	1(2.50)	9(22.50)	21(52.50)	1(2.50)	8(20.00)	2.85	3 rd

Source: Field Survey, 2023.

*Numbers inside the parenthesis are percentages.

4. Conclusion

The value chain analysis of cassava in the study area offers important insights into the production, processing, and marketing stages. It highlights the roles, challenges, and opportunities faced by farmers, processors, and marketers. The results show that cassava farming is currently more profitable, despite limited adoption of improved technologies. While processors earn more than marketers, their returns remain low compared to farmers. Encouraging farmers to adopt improved technologies could significantly increase their profitability, and similarly, increased technology adoption among processors and marketers is needed to enhance their returns and gross margins.

Based on the study's findings, it is crucial to enhance technology adoption among all actors in the cassava value chain within the study area. This can be facilitated by offering credit facilities at lower interest rates, enabling respondents to purchase essential machinery for production. Additionally, agricultural extension services should be utilized to provide technical support, training, and current information on modern farming, processing, and marketing techniques.

Farmers, in particular, should be educated on the importance of adopting improved technologies through government-led educational programs. Processors should have access to processing inputs at reduced costs. Marketers need to be made aware of the benefits of advertising, using packaging logos, and leveraging the internet to connect with buyers and sellers globally.

Finally, government intervention is needed in improving infrastructure such as road development and water supply in critical areas, as well as enacting policies that support cassava farmers, processors, and marketers.

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