JHER Vol. 32 (2) December 2025, pp. 172 – 182

Cassava (*Manihot esculenta*) Processing Skills Required by Unemployed Youths for Gainful Self-employment in Abia State, Nigeria

[1]Onwumere Michael; [2]Modebelu Melody N.; [1]Okara Catherine M.; [1]Ojemuyide Chidiebere C.; [5]Otozi Edwin I.; [1]Ezeoke Ngele C.; [1]Onwusi Clara A.
[1]Department of Vocational and Technical Education; [2]Faculty of Science Education; Bindura University of Science Education, Zimbabwe.
[5]Department of Educational Management & Foundational Studies, Alex Ekwueme Federal University, Ndufu-Alike Ikwo, Ebonyi State, Nigeria,
Corresponding Author: Onwumeremichael@gmail.com

Abstract

This study focused on cassava (*Manihot esculenta*) processing skills required by unemployed youths for gainful self-employment in Abia State, Nigeria. Specifically, it determined skills needed for raw cassava preparation; flour and starch processing. Three null hypotheses were tested at 0.05 level of significance. Descriptive survey design was adopted. Population comprised 491 stakeholders—43 lecturers, 32 agricultural extension officers, and 416 registered cassava processors. Questionnaire was used for data collection. Data were analyzed using mean, standard deviation, and ANOVA to test null hypotheses at a 0.05 significance level. Findings include, 11 skills for preparing cassava raw material, including ability to: select matured cassava roots ($\overline{X}$= 2.79), and others. Other findings are 14 skills for processing cassava into flour, including ability to: slice peeled and washed cassava roots into small pieces at x 2.8 cm ($\overline{X}$= 3.05) and so on. Further findings are 19 skills for processing cassava into starch, including ability to: grate cassava roots in a hammer mill ($\overline{X}$= 3.04), collect the mash with clean containers ($\overline{X}$= 3.17). findings also show no significance differences among the mean responses of the three groups of stakeholders on all the cassava processing skills at 0.05 level of significance. Five recommendations were made, including identified cassava processing skills should be integrated into vocational and agricultural training curricula for youths and others.

Keywords: Cassava, Processing, Starch, Flour, Skills, Unemployed, Youths, Self-Employment, Entrepreneurship.

Introduction

Cassava (*Manihot esculenta*) remains one of the most important staple crops in sub-Saharan Africa and a significant raw material for various agro-based industries (Akinpelu et al., 2020). It plays a central role in food security and rural income generation across Nigeria, where it is a vital food and industrial crop (FAO, 2023). As the world's largest cassava

producer, Nigeria harvested over 63 million metric tonnes in 2023 (FAO, 2024). Yet, less than 20% of this is processed into industrial or value-added products, with the majority consumed in raw or minimally processed forms, highlighting a significant level of underutilization (IITA, 2023). In Abia State, where youth unemployment persists, especially among secondary school leavers, polytechnic and university graduates, as well as out-of-school youths who lack vocational skills, agricultural value chains have gained attention as potential avenues for job creation and enterprise development among them. The crop's adaptability to poor soil conditions and drought makes it an ideal choice for small-scale farmers in the region, who form the backbone of Nigeria's agricultural sector (FAO, 2023). Its versatility has allowed cassava products to become staples in the daily meals of millions of Nigerians (Osuji, et al., 2017).

Cassava is not only a food crop but also a source of raw materials for numerous industrial products such as starch, flour, and ethanol (Onyenwoke et al., 2014). Beyond food security, cassava processing provides income and employment opportunities for millions. Its processing can significantly improve the lives of young people in Abia State by offering increased income, better livelihoods, and improved food security (Kimberly, 2018). Involvement in cassava processing allows youth to gain entrepreneurial skills and experience in business management, fostering a more diversified economy and reducing overdependence on traditional employment sectors. Cassava can be processed into several value-added products. Gari, a fermented and roasted granulated product popular in West Africa, requires skills in peeling, grating, fermenting, pressing, roasting, packaging, hygiene, basic bookkeeping, and cost analysis (Akinpelu et al., 2020). High quality cassava flour (HQCF), used in baking and food industries, involves mechanized peeling, washing, chipping or grating, controlled drying techniques, milling, and adherence to quality control standards (Nweke et al., 2022). For starch production, mature cassava roots are harvested, peeled, washed, grated into pulp, mixed with water, filtered to separate fiber, and left to settle to extract pure starch. These processes form the foundation of a broader cassava value chain that can support numerous entrepreneurial opportunities.

According to the National Bureau of Statistics (2025), youth unemployment in Abia State reached 34% by the end of 2024, making agro-processing a critical intervention point. Cassava's versatility supports processing into products such as high quality cassava flour (HQCF), gari, fufu, ethanol, animal feed, and industrial adhesives (Aworh, 2020; Ezedinma & Okechukwu, 2019). However, barriers such as lack of access to capital and modern equipment, inadequate agro-processing and entrepreneurial skills, poor market linkages, and limited awareness of value-chain options hinder youth participation (Nwajiuba et al., 2024). Experts advocate for targeted

interventions, including training programs, cluster-based processing centers, and policies that promote youth involvement (Adewuyi et al., 2023). Equipping youths requires practical vocational training and capacity building through workshops and hands-on sessions in rural communities and agricultural institutions (Okoye et al., 2016). Incorporating cassava processing laboratories into agricultural science curricula at secondary and tertiary levels can foster early innovation and enterprise development (Nweke et al., 2022). Agro-innovation hubs supported by public-private partnerships could serve as centers for training, production, and marketing. Governments and NGOs could support start-up ventures with small-scale processing kits, equipment, and access to microloans. Teaching digital skills related to marketing, logistics, and customer engagement could increase profitability and scalability for youth ventures (Akinpelu & Ogunsola, 2020). In addition to technical proficiency, young entrepreneurs must be trained in business planning, branding, food safety standards, regulatory compliance, and ICT for agribusiness (Okoye, 2016). The initiative should focus on unemployed or underemployed graduates, secondary school leavers, youth returning from urban migration, and members of youth farming cooperatives. This demographic, aged 18–35, is considered strategic due to their adaptability, energy, and openness to entrepreneurial ventures when properly supported (FAO, 2022).

A value chain encompasses all activities and services required to bring a product from conception through production to market, including seed selection, farm management, harvesting, primary and secondary processing, packaging, branding, logistics, and digital marketing (Gereffi, et al., 2020). By mastering these techniques, youths can increase their share of consumer value, turning cassava into a portfolio of high-value products. However, in cassava-rich areas like Abia State, the crop is still not performing to its potential due to poor post-harvest handling, inadequate market infrastructure, and low adoption of modern techniques (IITA, 2023). Youth engagement in value-added processing remains limited, partly due to structural and informational barriers such as limited processing knowledge, poor access to modern equipment, lack of technical training, and insufficient financial support (Eze et al., 2022; Nwajiuba et al., 2024).

Although various initiatives have attempted to support cassava production and basic processing issues, few studies have comprehensively focused on processing techniques most suitable for youth-led livelihoods. This gap has informed this study.

Objectives of the Study

The study focused on cassava processing skills required by unemployed youths for gainful self-employment in Abia State. Specifically, the study determined skills required by unemployed youths in Abia State for:

1. preparing cassava raw material for processing.
2. processing cassava into flour.
3. processing cassava into starch.

Hypotheses (HOs)

There is no significant difference among the means responses of the three groups of stakeholders on the skills required by youths in Abia State for:

HO_1: preparing cassava raw material for processing.

HO_2: processing cassava into flour.

HO_3: processing cassava into starch.

Methodology

***Research Design*:** The study adopted a survey research design.

***Area of the Study*:** Abia State Nigeria was the area of the study. Abia State has 17 local government areas (LGAs) and is situated in the rainforest agro-ecological zone, characterized by fertile soils and a bimodal rainfall pattern that makes it highly suitable for year-round agricultural production, particularly cassava farming. The state has a large population of youths, many of whom are unemployed or underemployed.

***Population of the Study*:** The population was made up of three groups namely, 43 university Faculty of Agriculture and Agricultural education lecturers, 32 Agricultural extension officers and 416 registered cassava processors in the area of the study. This population was made up of persons who are knowledgeable and possess requisite experience in cassava processing skills.

***Sample for the Study*:** The sample size for the study was 291 respondents. Purposively selected based on their areas of specialization. This comprising 34 university agriculture lecturers, all the 32 agricultural extension officers in the area and 225 cassava processors who were randomly selected.

***Instrument for Data Collection*:** A 44-item structured questionnaire used for data collection. It was developed based on the literature review and objectives of the study. It had five sections (A-E). Each item in the questionnaire was assigned a four-response option: Strongly Needed (SN) = 4, Needed (N) = 3, Not Needed (NN) = 2 and Strongly Not Needed (SNN) = 1. It was face-validated by three university experts in crop production. To establish the reliability of the instrument, a trial-test was conducted on 50 respondents outside the study area. Data were used to determine internal consistency of instrument using Cronbach Alpha method. The analysis yielded a reliability coefficient of 0.90, indicating that the instrument was highly reliable and suitable for use in the study.

***Method of Data Collection*:** A total of 291 copies of questionnaire were administered: 34 copies to lecturers, 32 to extension officers and 225 to cassava processors. Administration was by hand with the help of five trained research assistants. All the 291 copies distributed were retrieved. This represented 100 percent return for each of the three groups of respondents.

***Data Collection Technique*:** The data collected were analyzed using mean and

standard deviation. A cut-off point of 2.50 was used for decision making on the needed or not needed skills. Any item with a mean value of 2.50 or above ($\bar{X} \geq 2.50$) was considered needed while items with a mean value below 2.50 ($\bar{X} \leq 2.50$) were considered not needed. Analysis of Variance (ANOVA) was used to test the null hypotheses at a 0.05 level of significance.

Results

Table 1: Mean Responses, Standard Deviation and ANOVA (F- values) Results of Respondents on Skills Required Preparing Cassava Raw Material for Processing

S/N	Cassava Preparation Skills	$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_3$	SD_3	$\bar{X}_g$	F	D
	Ability to:									
1	select matured cassava roots	2.50	.51	2.99	.85	2.63	.52	2.71	6.4	N
2	peel the cassava roots to remove outer brown skin and inner thick cream layer	2.65	.61	3.21	.82	2.60	.58	2.82	14.92	N
3	remove any damage or woody parts from the roots with sharp knife	3.30	.98	3.45	.80	3.60	.49	3.45	1.39	N
4	soak peeled cassava in clean water for 10-20mins before washing	2.60	.58	3.45	.66	3.75	.44	3.27	44.97	N
5	wash peeled cassava thoroughly with clean water to remove dirt	2.97	.85	2.60	.49	3.21	.80	2.93	5.67	N
6	put in a big basket for water to drain to desire choice	2.60	.49	2.66	.48	3.10	.74	2.79	8.96	N
7	soaking to reduce cyanide and monitoring fermentation process	2.62	.57	2.90	.75	3.12	.94	2.88	2.61	N
8	mechanical grater or grinders	3.26	.82	2.61	.49	3.28	.87	2.99	5.41	N
9	press out water using manual or hydraulic presses	3.21	.82	3.12	.33	2.59	.49	2.97	10.46	N
1	sieving grated cassava or starch for purity	3.21	.85	3.28	.81	2.97	.85	3.15	2.71	N
1	sun drying or mechanical drying of cassava mash, flakes, or chips	3.26	.82	3.12	.94	3.20	.84	3.19	1.02	N

N_1 (Number of Lecturers = …; N_2 (Number of Extension Officers) =…; N_3 (Number of Cassava Processors) = …; $\bar{X}_1$ = Mean of Lecturers; SD_1 = Standard Deviation of Lecturers; $\bar{X}_2$ = Mean of

Extension Officers; SD_2= Standard Deviation of Extension Officers; $\bar{X}_3$ = Mean of Cassava Processors; SD_3 = Standard Deviation of Cassava Processors; $\bar{X}_g$ = Grand Mean; F=Analysis of Variance; D = Decision; N= Needed; Df = Degree of Freedom.

Table 1 shows that all eleven identified preparation skills had mean values between 2.50 and 3.60, above the cut-off point of 2.50. This indicates that skills such as selecting matured roots, peeling, washing, soaking, and drying are considered necessary. However, the ANOVA results indicated that differences observed in the item F-values were not statistically significance at 0.05 level of significance. Consequently, there are no significant differences among the mean of the responses of three groups on the skills required by youths in preparing cassava raw material for processing.

Table 2: Mean Responses, Standard Deviation and ANOVA (F- values) Results of Respondents on Skills Required by Youths in Abia State for Processing Cassava into Flour

S/N	Flour Production Skills	$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_3$	SD_3	$\bar{X}_g$	F	D
	Ability to:									
1.	slice the peeled and washed cassava roots into small pieces at x 2.8 cm.	2.66	.48	3.34	.74	3.16	.76	3.05	4.66	N
2.	collect the small pieces in a clean container for drying to desire	2.90	.75	3.06	.75	3.28	.81	3.08	0.1	N
3.	spread the sliced cassava evenly on clean black polyethylene sheets or mats placed in raised platforms.	2.61	.49	3.26	.82	3.12	.94	3.00	4.26	N
4.	stir the sliced cassava with piece of wood regularly for fast drying,	3.12	.31	3.21	.82	2.62	.57	2.98	12.31	N
5.	repeat string until sliced cassava are dried to a moisture content of 10-20%	2.62	.57	3.21	.85	3.17	.87	3.07	8.49	N
6.	pack dried sliced cassava into moisture-proof containers or sacks.	3.20	.83	3.26	.82	3.34	.74	3.27	0.44	N
7.	transport the dried, sliced cassava to harmer mill	3.16	.76	3.11	.80	3.06	.75	3.11	0.96	N
8.	mill dried sliced cassava to fine flour.	3.21	.80	2.59	.49	3.12	.94	2.97	7.98	N
9.	sieve, using appropriate mesh size if necessary	3.10	.74	3.12	.33	3.08	.82	3.10	2.21	N
10.	package the flour in clean	3.12	.94	3.20	.84	2.97	.79	3.09	0.61	N

	moisture proof container of 25kg, 50kg									
11.	label all bags with marker providing necessary product information on the label and the expiry date.	3.28	.87	3.20	.77	3.15	.78	3.21	0.38	N
12.	weight and pack in appropriate place in order of first packed first remove	2.59	.49	3.34	.74	3.06	.79	2.99	9.86	N
13.	store cassava flour or dried sliced cassava separately in cool dry place	2.97	.79	3.20	.83	3.17	.81	3.11	0.7	N
14.	keep the store clean and fresh by curb-webbing, and airing	3.20	.84	3.16	.76	2.94	.79	3.10	2.48	N

N_1 (Number of Lecturers = …; N_2 (Number of Extension Officers) =…; N_3 (Number of Cassava Processors) = …; $\bar{X}_1$ = Mean of Lecturers; SD_1 = Standard Deviation of Lecturers; $\bar{X}_2$ = Mean of Extension Officers; SD_2= Standard Deviation of Extension Officers; $\bar{X}_3$ = Mean of Cassava Processors; SD_3 = Standard Deviation of Cassava Processors; $\bar{X}_g$ = Grand Mean; F=Analysis of Variance; D = Decision; N= Needed; Df = Degree of Freedom.

All fourteen flour-processing skills recorded mean values ranging from 2.59 to 3.34, which are above the cut-off. Skills such as slicing, drying, milling, sieving, packaging, and proper storage were rated as essential. Similarly, the ANOVA (F-values) results showed no significant difference across the item responses. The null hypothesis was retained, suggesting that lecturers, extension officers and cassava processors held similar opinion on the flour processing skills.

Table 3: Mean Responses, Standard Deviation and ANOVA (F- values) Results of Respondents on Skills Required by Youths in Abia State for Processing Cassava into Starch

S/N	Starch Production Skills	$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_3$	SD_3	$\bar{X}_g$	F	D
	Ability to:									
1	grate the washed, peeled cassava roots in a hammer mill	2.91	.75	3.12	.94	3.08	.82	3.04	1.13	N
2	collect the mash with clean containers	3.26	.82	3.28	.94	2.97	78	3.17	3.78	N
3	add water to the cassava mash	3.11	.80	3.28	.81	3.15	.78	3.18	0.13	N
4	stir the mash with water until well mixed	3.20	.84	3.12	.94	3.06	.79	3.13	1.31	N
5	tie/place the sieve on a big bowl to collect watery starch	2.59	.49	3.21	.86	2.91	.75	2.90	8.68	N
6	pour a little quantity of the grated/mash on the sieve	2.61	.49	3.26	.82	2.61	.49	2.83	6.5	N
7	wash the mash until no milky starch comes out.	3.20	.84	3.11	.80	3.12	.32	3.14	1.28	N

Table 3 Continued

8	keep the milky starch into a drum for 24hours (overnight)	3.20	.77	3.21	.82	3.06	.81	3.16	1.01	N
9	drain out the clean water	3.34	.74	3.21	.85	2.61	.49	3.07	3.4	N
10	scrape off the soft surface of the starch cake	2.91	.75	3.26	.82	3.20	.83	3.12	1.23	N
11	pour the wet starch in bag for dewatering to continue	2.61	.49	3.11	.80	2.65	.48	2.78	5.97	N
12	remove the lump starch into a container	3.12	.33	3.06	.81	2.94	.79	3.04	0.64	N
13	place little lumps of starch in trays	3.21	.80	3.08	.82	2.56	.69	2.95	3.24	N
14	place the trays with starch on elevated plat-form for drying	3.10	.74	2.97	78	3.21	.80	3.09	1.35	N
15	dry the starch to a moisture content of 12%	3.12	.94	3.15	.78	2.60	.49	2.96	7.33	N
16	grind starch lumps into powder	3.28	.94	3.06	.79	2.66	.48	2.95	5.4	N
17	package the starch flour in sachets	3.28	.81	2.94	.79	3.16	.75	3.13	0.83	N
18	packed in cartons ready for markets	3.12	.94	3.20	.83	2.97	78	3.09	1.42	N
19	store unsold cartons on a raised plate-form and clean dry place	3.21	.86	2.65	.48	2.67	.47	2.84	4.94	N

N_1 (Number of Lecturers = …; N_2 (Number of Extension Officers) =…; N_3 (Number of Cassava Processors) = …; $\bar{X}_1$ = Mean of Lecturers; SD_1 = Standard Deviation of Lecturers; $\bar{X}_2$ = Mean of Extension Officers; SD_2= Standard Deviation of Extension Officers; $\bar{X}_3$ = Mean of Cassava Processors; SD_3 = Standard Deviation of Cassava Processors; $\bar{X}_g$ = Grand Mean; F=Analysis of Variance; D = Decision; N= Needed; Df = Degree of Freedom.

Nineteen starch-processing skills had mean values ranging from 2.56 to 3.28, all above the cut-off point. These included grating, sieving, sedimentation, drying, and packaging. More so, the ANOVA results revealed that while the F-values varied across items, none were significant at the 0.05 level. Thus, the null hypothesis was retained indicating consensus among the three groups on starch processing skills.

Discussion

Findings on skills needed for preparing cassava raw material for processing (Table 1) demonstrate that cassava preparation skills are indispensable for quality and safety in processing. The finding conforms with the results of Oni and Oladele (2022), who identified cassava root selection, peeling, washing, and soaking as crucial pre-processing skills necessary for quality cassava product outcomes. Similarly, Eze and Nwankwo (2020) emphasized that proper preparation techniques such as washing and fermentation are vital for detoxifying cassava and ensuring food safety. Okonkwo *et al*. (2019) also noted that skill acquisition in traditional processing steps is key for empowering rural youth and improving cassava value-chain productivity. The views and observations of the authors cited on the skills required

by youths in Abia State for preparing cassava raw material for processing helped to justify the findings of the study on objective 1.

The findings on flour production skills (Table 2) aligns with the result of Nweke et al., (2022), who described flour production as a multi-stage process requiring attention to moisture control and hygiene. Ezedinma and Okechukwu (2019) also emphasized the profitability and employment potential of high-quality cassava flour (HQCF) when youths are equipped with the right skills. The perspectives and observations of the cited authors regarding the skills required by youths in Abia State for processing cassava into flour support and validate the study's finding related to objective 2.

Data in Table 3 provide understanding into the skills required by youths in Abia State for processing cassava into starch. The data presented in Table 3 shows that all respondents identified grating, sieving, sedimentation, and drying as key competencies required. The findings on cassava starch processing similarly reflect earlier reports by Aworh (2023) and Ofoegbu et al., (2024) who established that processing cassava into industrial starch requires precision in sieving, sedimentation, drying, and packaging. The views and observations of the authors cited on the skills required by youths in Abia State for processing cassava into starch support and validate the study's finding related to objective 3.

Conclusion

The study concludes that unemployed youths in Abia State require practical skills in cassava preparation, flour processing, and starch production to effectively engage in gainful self-employment. The consensus among lecturers, extension officers, and processors validates these competencies as critical for sustainable youth empowerment, improved food security, and economic diversification. By focusing on these skills, cassava processing can become a strategic solution to unemployment and poverty reduction in the state.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. The identified cassava processing skills should be integrated into out-off-school vocational and agricultural training curricula for unemployed youths, by government.
2. Government and private partners should establish functional cassava processing centers to serve as hubs for training, production, and marketing.
3. Youths should be provided with access to equipment, starter kits, and affordable credit facilities to support cassava-based enterprises.
4. Extension officers and experienced processors should serve as mentors to ensure continuous skills transfer and capacity building.
5. Policies should strengthen market linkages, promote value addition, and

ensure adherence to quality and safety standards for cassava products.

References

Adewuyi, S. A., Adebayo, K., & Olaniyan, A. A. (2023). Youth engagement in cassava processing and value addition in Nigeria: Policy perspectives and opportunities. *Journal of Agricultural Extension and Development*, 15(2), 45–56.

Akinpelu, A. O., & Ogunsola, G. O. (2020). Digital skills and agribusiness: Enhancing youth participation in cassava value chain. *Nigerian Journal of Agricultural Extension*, 21(1), 88–97.

Akinpelu, A. O., Olaleye, R. S., & Ogunyemi, T. (2020). Value addition approach to cassava processing for sustainable food security in Nigeria. *Journal of Food Systems and Development*, 12(4), 56–69.

Aworh, O. C. (2020). Promoting food security and sustainability through cassava value chain development in Africa. Food Control, 118, 107–117.

Aworh, O. C. (2023). Industrial utilization of cassava starch: Emerging opportunities and challenges. *African Journal of Food Science and Technology*, 14(1), 1–10.

Eze, S. O., & Nwankwo, U. C. (2020). Food safety in cassava processing: Detoxification practices among rural processors in southeastern Nigeria. *International Journal of Food Safety*, 9(2), 101–112.

Eze, S. O., Ofoegbu, C., & Nwachukwu, V. (2022). Barriers to youth participation in cassava processing enterprises in rural Nigeria. *Journal of Agribusiness and Rural Development*, 8(3), 55–66.

Ezedinma, C., & Okechukwu, R. U. (2019). High-quality cassava flour production and its employment potential in Nigeria. *Nigerian Food Journal*, 37(2), 14–21.

FAO. (2022). Youth in agribusiness: Fostering employment and innovation in Africa. Food and Agriculture Organization of the United Nations.

FAO. (2023). Cassava and food security in sub-Saharan Africa. Food and Agriculture Organization of the United Nations.

FAO. (2024). FAOSTAT: Cassava production statistics. Food and Agriculture Organization of the United Nations.

Gereffi, G., Humphrey, J., & Sturgeon, T. (2020). The governance of global value chains. *Review of International Political Economy*, 12(1), 78–104.

IITA. (2023). Cassava value chain development in Nigeria: Progress and prospects. International Institute of Tropical Agriculture.

Kimberly, P. (2018). Cassava processing and livelihood opportunities for African youth. *Journal of Development Studies*, 54(6), 1045–1060.

National Bureau of Statistics. (2025). Labour force statistics: Unemployment and underemployment report (Q4 2024). National Bureau of Statistics, Nigeria.

Nwajiuba, C., Eze, S., & Madu, I. (2024). Agricultural value chains and youth employment in southeastern Nigeria. *African Development Review*, 36(1), 77–91.

Nweke, F. I., Okoye, B. C., & Ugwu, B. O. (2022). High-quality cassava flour (HQCF) processing technologies and prospects in Nigeria. *African Journal of Agricultural Economics*, 17(2), 112–124.

Ofoegbu, C., Eze, S., & Uchenna, J. (2024). Industrial starch processing from cassava: Techniques and innovations. *Nigerian Journal of Food Technology*, 25(1), 45–59.

Okonkwo, C. U., Eze, J. E., & Obi, P. (2019). Empowering rural youth through cassava value-chain skills acquisition. *Journal of Rural Development Studies*, 10(2), 33–47.

Okoye, B. C., Eze, S. O., & Nwosu, J. (2016). Vocational skills development in cassava value chain for youth empowerment in Nigeria. *Journal of Agricultural Education and Extension*, 22(4), 341–356.

Oni, O. A., & Oladele, O. I. (2022). Critical pre-processing skills for quality cassava products among rural women processors in Nigeria. *Journal of Agricultural Extension*, 26(2), 77–88.

Onyenwoke, C. A., Eke-Okoro, O. N., & Nwankwo, S. C. (2014). Industrial potentials of cassava in Nigeria. *African Journal of Biotechnology*, 13(1), 1–8.

Osuji, C. M., Nweke, F. I., & Okoro, A. (2017). Cassava utilization patterns and implications for food security in Nigeria. Food Policy, 69, 94–103.