International Journal of Organic agricultural Research & Development
Volume 21 (1) (2026)

THE ROLE OF AGRICULTURAL VALUE CHAIN IN REDUCING POST HARVEST LOSSES IN CASSAVA PRODUCTION IN ATISBO LOCAL GOVERNMENT AREA OF OYO STATE.

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ABSTRACT

The study assessed the role of agricultural value chains in reducing post-harvest losses among cassava farmers with specific objectives as to identify the causes of post-harvest losses, examine the role of value chain in reducing post-harvest losses and identify constraints encountered by the farmers in preventing post harvest losses in cassava production. Multi- stage sampling procedure was employed for the selection of one hundred and twenty respondents. Data for the study was collected using structured questionnaire. Frequency, percentages, and means were used to analyze the data. Data collected was analyzed using descriptive statistics, and factor analysis was used to measure the constraints encountered by the farmers in preventing postharvest loses, the constraints are grouped into factors such as factors 1: (Financial and extension factor). This has the following loading variables inadequate finance to attend training on value chain addition (0.757), lack of knowledge on the value chain addition (0.706), poor extension support (0.677) while shortage of packaging materials (0.643) and pest and diseases (0.613). Cassava farmers encountered constraint of finance to attend training on value chain and this might be due to the high fees of attending training and low income from farming. Factor 2: (Harvesting and distance factor); the loading variables under factor 2 (Harvesting and distance factor) include Poor harvesting technique (0.882) and Distance to market (0.835). Poor harvesting technique was another constraint affecting farmers in reducing post-harvest losses. It recommends that farmers adopt timely harvesting, improved storage, and collective marketing strategies to minimize losses and maximize profitability.

Key words: Value chain, Post-Harvest Loses, Cassava production.

INTRODUCTION

Agricultural productivity is an integral part of food security. As population continues to grow, Scholars argued that consented efforts should be made towards increasing agricultural production, especially in the regions of the World where population growth poses a threat to the food security (Almed, 2017). This calls for a sustainable food production that would guarantee food availability both in quantity and quality. Increasing productivity depends on the ability of farmers (producers and processors) to adopt new and sustainable agricultural practices that would increase agricultural productivity and at same time sustain n human and the environment (Otu *et al,* 2014) This is possible with an efficient food functioning system, where farmers can boast of return on their labour, reduce food importation, food prices and consequently combat hunger.

Karolina and Małgorzata (2020) revealed that agriculture has a much greater impact on reducing poverty and improving food security than any other sector of the economy. While there has been a clarion call for increased agricultural transformation on food and nutrition security, there is uncertainty surrounding global agriculture's capacity to service this call. With an expected global population increase of more than 2 billion (from 7.6 to 9.8 billion) by 2050; the natural resource depletion, and a changing climate which are further exacerbated by recent Covid 19 pandemic which is still putting pressure on an already stretched food supply, according to (Rupa et al., 2018), a concerted effort must be made to apply zero tolerance for food waste in this twenty first century. Accordingly, (Sawicka, 2019) was of the opinion that post-harvest loss remains a threat to attaining global food security. In Nigeria pre and post-harvest loss has been estimated to range between 5 and 20 percent for grains; 20 percent for fish, and as high as between 50 and 60 percent for tubers, fruits, and

vegetables (Okojie, 2021). The post-harvest losses for roots and tubers, with particular emphasis on cassava roots were at about 35% of the national post-harvest losses ((Oyewole, 2019).

Cassava (*Manihot esculenta*) is the third most important source of calories in the tropics, after rice and maize; and the second one in Africa (FAO, 2004). According to the FAO, as of 2018, world cassava production stood at about 278 million tonnes. Africa total production was about 170 million tons (about 56% of world production) (FAOSTAT, 2019), making Nigeria the largest producer of cassava in the world with an annual production of over 40 million metric tons (mt) (Adegboyega, 2013). It is grown and consumed across all the agroecological zones of Nigeria. According to sources, the major growers are the southern and Middle Belt states of the Country.

Losses are a measurable reduction in foodstuffs and may affect either quantity or quality (Tyler and Gilman, 2003). They arise from the fact that freshly harvested agricultural produce is a living thing that breathes and undergoes changes during postharvest handling. Loss should not be confused with damage, which is the visible sign of deterioration, for example, chewed grain and can only be partial. Damage restricts the use of a product, whereas loss makes its use impossible. Losses of quantity (weight or volume) and quality (altered physical condition or characteristics) can occur at any stage in the postharvest chain Economic loss can also occur if the produce is subsequently restricted to a lower value market (World Bank 2011.). Here, food loss is a subset of PHL and represents the part of the edible share of food that is available for consumption at either the retail or consumer levels but not consumed for any reason.

Post-harvest loss is an attribute of inefficient food functioning system. The deterioration of cassava roots causes a reduction in quality, which has implications on marketing of cassava leading to price discounts. Transportation of harvested roots through terrible bad roads to the market, sometimes result to break down of vehicles. Rural markets have designated days for market activities so that most often majority of the farmers hardly meet up with stipulated time, hence there is periodic wastage of cassava roots. The use of locally fabricated and inefficient Cassava processing equipment's has helped in any way, their processes record a tremendous food loses due to poor processing practices and inefficient Technology. The post-harvest diseases, crumbling infrastructure and sketchy power supply are contributing factors (Affognon *et al.* 2015) added that non-standard bags could lead to loss of grain quality by permitting exposure to moisture, insects, and contaminants. However, achieving food sufficiency in Nigeria has continued to remain a mirage as postharvest loss continues to rear its ugly head in our agricultural system. It is against this background that this study tends to investigate the agricultural productivity and postharvest loss among cassava farmers in Nigeria.

This study aims to address the gap in understanding the role of value chain in post harvest loses in cassava production in Atisbo local government of Oyo state. To achieve this goal, the study has outline the following specific objectives.

I describe the socio-economic characteristics of the respondents

ii examine the causes of post-harvest losses

iii identify the role of value –chain in reducing post-harvest loses in cassava production.

iv ascertained the constraints encountered by the farmers in preventing post-harvest losses in cassava production.

Research Methodology

Description of the study area

The study was carried out in Atisbo Local Government Area. The Administrative Headquarters of Atisbo Local Government Area is situated at Tede. Atisbo Local Government falls within Latitude 8.3698° or 8° 22' 11" north and Longitude 3.2467° or 3° 14' 48" east. It is one of the thirty-three Local Government Area carved out in Oyo State. It was carved out of the now defunct Ifedapo Local Government which had its headquarters in Saki Town which is the present headquarters of Sakí West Local Government. It is bounded in the West by Orire Local Government, in the East by Republic of Benin, in the North. The rainy season commences from March to September ending rainfall of 25mm between May and July and 2.5mm between December and January which has a total area of 2,997 square kilometers. The predicted average temperature and humidity for the area are 28 degrees Celsius and 61 percent, respectively, it is bounded in the North-west by Saki-West Local Government, the North-East by Saki-East Local Government, the South-East by Itesiwaju Local Government and in the South-West by Iwajowa Local Government. And a population of 110,792 at the 2006 census.

.A Multi-stage sampling procedures, involving combination of purposive and random sampling techniques was employed. 6 wards out of 20 wards in Atisbo local government of Oyo State was selected because of the concentration of the cassava farmers in the area. In the first stage, six (6) out of the twenty (20) wards was purposively selected, while ten (10) villages were randomly

selected from the list of village's registers of the cassava association they belong to. The final stage involved the random selection of twelve (12) cassava farmers from each of these villages, using questionnaire, only the data of one hundred and twenty (120) farmers were used for further analysis. Data were collected by means of questionnaire. Descriptive statics such as frequency, mean and percentage, mean score and standard deviation were used for the data analysis. while inferential statistics such as factor analysis were also used.

RESULT AND DISCUSSION

The result in table 1 reveal that (27.3%) of the respondents were between 31-40 years old, while (23.1%) of the respondent are 41-50 years old ,(19.0%) are 21-30 years,17.4% are 51-60 years,10.7% are 61 year above and 1.7% are 10-20 years. The average age of the farmers are 36 years old, This indicates that most of the respondent were young also their experience also show that 21.5% of the farmers have been in the business of cassava production for the past 1-5 years, while 34.7% spent 6-10 years of cassava production experience,17.4% of the respondent spent 11-15 years while 15.7% spent 16-20 years, The average farming experience was (11 years) meaning that the farmers have spent more than a decade in the enterprise to understand the rudiments cassava farming in the area The findings supports Oluwatayo *et al.* (2008) that farmers with more experience would be more efficient i.e have better knowledge and thus expected to run more efficient and profitable enterprise. The result of their educational status shows that 24.8% of the farmers had primary education, 38.8% had secondary education, 14.9% had tertiary education, and 21.5% had no formal education this distribution suggest that a significant proportion of the farmers have some level of formal education which could influence their knowledge of postharvest losses. Uchemba *et al.* (2021) reported that education has a great influence on the postharvest losses in cassava production Moreover the respondents access to credit shows that 61.2% of the farmers have access to formal and quality credit while the remaining 38.8% do not. Accessing agricultural credit will help farmers to expand their production and improve their livelihoods, the respondent access to storage facilities shows that 24.0% of the farmers have access to storage facilities, while 74.4% do not, it suggests a significant need for improved storage infrastructure to support agricultural productivity.

Table 1: Socio economic characteristic of the respondent.

Variable	Frequency	Percentage	Mean
Age(Years)			
10-20	2	1.7	
21-30	23	19.0	
31-40	33	27.3	**36years**
41-50	28	23.1	
51-60	21	17.4	
61 and above	13	10.7	
Household Size			
1-4	**75**	**62.0**	
5-8	**13**	**10.7**	**2person**
9-12	**31**	**27.3**	
Estimated annual Income			
50,000-100,000	**4**	**3.3**	
101,000-150,000	**7**	**5.8**	
151,000-200,000	**20**	**16.5**	
201,000-250,000	**7**	**5.8**	**301,000**
251,000-300,000	**20**	**16.5**	
301,000 and Above	**61**	**50.4**	
Farming Experience 1-5			
6-10	**26**	**21.5**	
11-15	**42**	**34.2**	
16-20	**21**	**17.4**	
21-25	**19**	**15.7**	
26-30	**5**	**4.1**	**8years**
31 And Above	**5**	**4.1**	
	2	**1.7**	
Sex			
Male	**68**	**57.9**	
Female	**51**	**42.1**	
Marital Status			
Single	**22**	**18.2**	
Married	**77**	**63.6**	
Divorced	**8**	**6.6**	
Widow(Er)	**13**	**10.7**	
Educational Status			
Primary	**3 0**	**24.8**	
Secondary	**4 6**	**38.0**	
Tertiary	**1 8**	**14.9**	
No Formal Education	**2 6**	**21.5**	
Access to Extension Service Yes	**35**	**28.9**	
No	**85**	**71.1**	
Access To Credit Facilities			
Yes	**73**	**61.2**	
No	**47**	**38.8**	
Mode Of Land Ownership			
Inheritance	**42**	**34.7**	
Lease	**56**	**46.3**	
Purchased	**12**	**9.9**	
Community Owned	**3**	**2.5**	
Gifted	**6**	**6.6**	
Sources Of finance			
Bank	**2 9**	**24.0**	
Personal Saving	**5 4**	**44.6**	
Friend And Relatives	**1 4**	**11.6**	
Cooperative	**2 1**	**17.4**	
Microfinance Bank	**2**	**1 . 7**	
Farm Size			
1-10	**90**	**93.5**	
11-20	**7**	**5.4**	**7.5**
21 And Above	**3**	**1.1**	

Causes of Post-Harvest Losses

The finding revealed that inadequate information on cassava perishability (mean=2.29), poor storage facilities (mean=2.20), Large volume of cassava products (mean=2.18), were the most important identified causes of post-harvest losses with their respective mean. This is because inadequate information on cassava handling and storage significantly affect its perishability, cassava roots are highly prone to degradation, spoiling within 48hours after harvest if not properly processed or stored. This perishability issue can be mitigated with acute information on best practices for handling, process and storage also poor storage facilities significantly contribute to post harvest losses particularly among small holder farmers. According to a study on Cassava post-harvest losses in South

west Nigeria. (Gustavsson *et al.,* 2011) stated that the causes of food losses and waste in developed countries mainly relate to consumer behavior as well as to a lack of coordination between different actors in the supply chain.

Causes	Very Serious	Serious Serious	Not	Mean	Rank
Large volume of cassava product	19(15.8)	61(50.8)	40(33.3)	2.18	3
High supply of cassava at the village market	44(36.4)	61(50.4)	15(12.4)	1.76	14
Delay in processing	31(25.6)	48(39.7)	41(33.9)	2.08	5
Inadequate finance	29(24.0)	67(55.4)	24(19.8)	1.96	8
Inadequate harvesting time	31(25.6)	46(38.0)	43(35.5)	2.10	4
Machine breakdown at the processing center	35(28.9)	52(43.0)	33(27.3)	1.98	7
Poor storage facilities	18(14.9)	60(49.6)	42(34.7)	2.20	2
Unlimited availability of packaging material	38(31.4)	61(50.4)	21(17.4)	1.86	11
Inadequate information on cassava perish-ability	22(18.2)	41(33.9)	57(47.1)	2.29	1
Losses through transportation	41(33.9)	58(47.9)	21(17.4)	1.83	13
Pest and disease	33(27.3)	69(57.0)	18(14.9)	1.88	10
Stealing	33(27.3)	53(43.8)	34(28.1)	2.01	6
Inadequate harvesting or processing technologies	33(27.3)	71(58.7)	16(13.2)	1.86	11
Inadequate extension service	25(20.7)				

Sources: Field survey, 2025

The role of value –chain in reducing post-harvest loses in cassava production

Table 3 revealed that sorting and clearing (mean=2.48), good storage (mean=1.98), proper handling at harvest (mean=1.86) and market accessibility (mean=1.83) were the most important identified roles of agricultural value chain in reducing post-harvest losses. This indicates that sorting and clearing play a crucial role in reducing post-harvest losses in agricultural value chain. Sorting and clearing enable farmers to separate high-quality produce from damaged or spoiled ones, reducing the risk of contamination and losses during storage and transportation. This process also helps to classify produce by size or quality factors, making it easier to market and sell. Good storage also plays a vital role in reducing post-harvest losses in agricultural value chains. Effective storage practices are crucial for extending shelf life, minimizing losses, and improving the marketability of produce. These practices involve controlling temperature, humidity, and ventilation, as well as implementing strategies like hermetic storage, improved warehouses, cold storage, and proper handling Maintaining optimal temperature and humidity levels, along with proper ventilation, helps slow down ripening, prevent spoilage, and reduce the risk of mold growth. Using airtight containers or bags creates an environment that reduces moisture and pest damage, thus extending shelf life also use of refrigeration slows down physiological processes and microbial growth, preserving the freshness of produce.

Table 3: Roles of Value Chain In Reducing Post Harvest Losses In Cassava Production

Roles Of Actors	Always	Often	Not At All	Mean	Rank
Seek for additional support for value chain addition	46(38.0)	67(55.4)	7(5.8)	1.67	7
Sorting and clearing	10(8.3)	42(34.7)	68(56.2)	2.48	1
Proper peeling	64(52.9)	49(40.5)	6(5.0)	1.68	6
Adequate length of drying	71(58.7)	47(38.8)	2(1.7)	1.43	13
Soaking	52(43.0)	60(49.6)	8(6.6)	1.63	9
Proper packaging	60(49.6)	49(40.5)	11(9.1)	1.59	11
Proper handling at	38(31.4)	61(50.4)	21(17.4)	1.86	3
harvesting Use of improved	49(40.5)	63(52.1)	8(6.6)	1.66	8
varieties Good storage	56(46.3)	38(31.4)	24(19.8)	1.98	2
Transportation	60(49.6)	51(42.1)	9(7.4)	1.58	12
Packing of roots	44(36.4)	64(52.9)	12(9.9)	1.73	5
Market accessibility	27(22.3)	86(71.1)	7(5.8)	1.83	4

Sources: Field survey 2025

The constraints encountered by the farmers in preventing post-harvest losses in cassava production.

The factor analysis of the constraints encountered by the cassava farmers is shown in Table 4. The constraints are grouped into factors such as factors 1: (Financial and extension factor). This has the following loading variables inadequate finance to attend training on value chain addition (0.757), lack of knowledge on the value chain addition (0.706), poor extension support (0.677) while shortage of packaging materials (0.643) and pest and diseases (0.613). Cassava farmers encountered constraint of finance to attend training on value chain and this might be due to the high fees of attending training and low income from farming. Factor 2: (Harvesting and distance factor); the loading variables under factor 2 (Harvesting and distance factor) include Poor harvesting technique (0.882) and Distance to market (0.835). Poor harvesting technique was another constraint affecting farmers in reducing post-harvest losses, this was supported by Jaspreet et al. (2013) that postharvest loss of cassava is the highest at harvesting in dry season due to hardness of the soil which results in heavy breakage of the roots. This further confirms the findings of which postulates that food losses occur majorly at the field-market stage. Other loading in Factor 3: (Facility factor) include Inadequate transportation facilities (0.711) and Lack of modern storage facilities (0.703) this was supported by (Zhang and Deng, 2012) According to the survey report on supermarket fresh logistics distribution centers in 2006, loss of fruits and vegetables mainly lies in processes of transportation, sorting, storage and shipping .The loading variables under factor 4(Policy factor) include inconsistent government policies on value chain addition (0.504) ,this are the major factors affecting post-harvest losses in the developed country such as Nigeria.

Table 4: Constraints encountered by the farmers in preventing post-harvest losses in cassava production

Constraints	Financial and Extension Factor	Harvesting and Distance Factor	Facility Factor	Policy Factor
Inadequate finance to attend training on value chain addition	**.757**	.029	.069	.291
Lack of knowledge on the value chain addition	**.706**	.063	.137	.390
Poor Extension support	**.677**	.066	.120	.469
Shortage of packaging materials	**.643**	.086	.443	.433
Inconsistent government policies on value chain addition	.639	.161	..360	**.504**
Pest and disease	**.613**			
Poor Harvesting technique	.134	**.882**	.084	.092
Distance to Market	.243	**.835**	.113	.127
Lack of temperature and relative humidity control	.146	.468	.020	.207
Inadequate Transportation Facilities	.496	.224	**.711**	.277
Lack of mordern storage facilities	.503	.235	**.703**	.289
Transportation hazard	.248	.142	.366	.373
Inadequate sorting	.332	.174	.089	.068

CONCLUSION AND RECOMMENDATIONS

This study shows that post-harvest losses in cassava production can be reduce to the nearest minimum if adequate steps are taking by the farmers such as adequate storage system and Proper handling at harvesting are put in place at the right time.

Based on the conclusion of this study, the following recommendations were made:

i. Cassava farmers should be provided with adequate training on value addition that reduces post-harvest losses in cassava production.

ii. Policymakers should enact and enforce supportive agricultural policies that reduce bureaucratic constraints on farmers.

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