



## Causes Of Cassava Post-Harvest Losses Among Farmers In Imo State, Nigeria

<https://dx.doi.org/10.4314/jae.v27i2.7>

### Anyoha, Nndi-Paschal Ogochukwu

Corresponding author

Department of Agricultural Extension,

Federal University of Technology, Owerri, Nigeria

E-mail: [nndi-paschal.anyoha@futo.edu.ng](mailto:nndi-paschal.anyoha@futo.edu.ng)

Phone: +234 (0) 8033396100

Orchid ID: [0000-0002-1860-0472](https://orcid.org/0000-0002-1860-0472)

### Udemba, Cornelia

Department of Agricultural Extension,

Federal University of Technology, Owerri, Nigeria

E-mail: [Cornerlia4christ@gmail.com](mailto:Cornerlia4christ@gmail.com)

Phone: +234 (0) 8135644612

### Okoroma, Emmanuel

Department of Agricultural Economics and Extension,

University of Uyo, Nigeria

E-mail: [oserv55@yahoo.com](mailto:oserv55@yahoo.com)

Phone: +234 (0) 8064896919

Orchid ID: [0000-0002-5834-1428](https://orcid.org/0000-0002-5834-1428)

### Ogbonnaya, Aja

Department of Agricultural Extension,

Federal University of Technology, Owerri, Nigeria

E-mail: [ogboajauwa@gmail.com](mailto:ogboajauwa@gmail.com)

Phone: +234 (0) 8037771041

Orchid ID: [0000-0001-6566-5204](https://orcid.org/0000-0001-6566-5204)

Submitted: 29<sup>th</sup> October, 2022

First Request for Revision: 21<sup>st</sup> November, 2022

Revisions: 27<sup>th</sup> November, 2022; 5<sup>th</sup> January, 5<sup>th</sup> and 17<sup>th</sup> March, 2023

Accepted: 19<sup>th</sup> March 2023

Published: 2<sup>nd</sup> April 2023

Cite as: Anyoha, N. O., Aja, O.O., Udemba, H. C., Okoroma, E.O.(2023). Causes of cassava post-harvest losses among farmers in Imo State, Nigeria. *Journal of Agricultural Extension*. *Journal of Agricultural Extension* Vol 27 (2) 73-79.

<https://dx.doi.org/10.4314/jae.v27i2.7>

**Keywords:** Post-harvest cassava losses, forms of cassava post-harvest losses.

**Conflict of interest:** The authors declare that no conflict of interest existed for this study.

**Acknowledgements:** We acknowledge the staff of the Department of Agricultural Extension, Federal University of Technology, Owerri for the provision of enabling environment.

**Funding:** This research was self-funded and no funds were received externally.

**Authors' Contribution :**

ANO(40%): Conceptualization; Content review,; Reporting.

UHC(35%) : Data collection; Coding; Analysis; Reporting.

AOO(15%): Content Review; Supervision.

OEO(10%): Content Review; Supervision.

## Abstract

*The study examined the causes of cassava post-harvest losses among farmers in Imo State, Nigeria. A structured questionnaire was used to obtain data from 120 rural farmers using multistage, random and purposive sampling techniques. Data were analysed using percentage, mean and standard deviation. Findings from the study reveal that farmers frequently used mobile phone calls/SMS as their sources of information on cassava post-harvest losses ( $\bar{x} = 3.01$ ) followed by the use of radio ( $\bar{x} = 2.5$ ). The findings also revealed that farmers experienced different forms of post-harvest cassava losses at one point or the other. Physical loss was experienced by 95.64% of the respondent, economic loss (93.8%) and monetary loss (97.7%). The causes of cassava post-harvest losses included lack of finance ( $\bar{x} = 3.56$ ) poor storage ( $\bar{x} = 3.46$ ) pest and disease infection ( $\bar{x} = 3.46$ ) inappropriate harvesting time ( $\bar{x} = 3.40$ ) among others. Most of the causes of cassava post-harvest losses identified in the study area are serious. Cassava farmers should be granted credit facilities and been courage to form cooperatives to help raise the funds and get facilities needed to reduce post-harvest losses.*

## Introduction

Cassava can increase the income of farmers, mitigate rural and urban poverty, and contribute to closing the food gap. Cassava, without a doubt, has tremendous potential for feeding Africa's increasing population (Awotide et al., 2019). Cultivating cassava for local consumption and processing for industrial use is a huge investment that can transform Nigeria's economy. Cassava serves several purposes, including famine reserve, food and cash crop, industrial raw material, and animal feeds.

The causes of post-harvest losses differ by country. Excess supply, early harvesting, improper processing and storage infrastructure, insufficient market system, excessively high standards for the weight, shape, and visual appeal of farm produce and a lack of expertise about effective post-harvest management are among the factors that contribute to post-harvest losses especially in developing countries like Nigeria (Maduka et al., 2019).

According to Food and Agriculture Organization (FAO) (2019), one-third of farm harvest produced for human consumption is lost or wasted, amounting to approximately 1.3 billion tons per annum. Food loss and waste cause an estimated \$940 billion in global economic losses each year.

Post-harvest physiological degradation has evolved into one of the critical barriers to commercial cassava production and usage because it is caused by the unavoidable physical damage to roots, both during and after harvesting.(Fondong and Rey , 2018).

Cassava's swift post-harvest deterioration limits its storability to a few days. Besides direct crop loss, post-harvest deterioration results in a decline in root quality, which result in price markdowns and adds to financial losses. These post-harvest losses can be as a result of excess supply, early harvesting, improper processing and storage infrastructure, visual appeal of farm produce and a lack of expertise about effective post-harvest management among other reasons.

Rural farmers have been producing cassava without having adequate knowledge about storage facilities or processing methods (Fondong and Rey, 2018). The knowledge of post-harvest losses improves farmers' production of cassava to ensure the availability of the crop and its product throughout the year. According to Awotide et al. (2019), education is crucial in raising awareness in farming communities because educated people can find information regarding agricultural advancements. Generally, to make agricultural production profitable, through the provision of agricultural services, other essential institutions and actors should be maximally engaged apart from extension service in provision of knowledge and information(Anyoha and Anaeto, 2021) However, the knowledge on post-harvest cassava losses in Imo State is still not clear. A gap still exists in knowledge on what constitutes the losses. The study was designed to help improve farmers' and intermediaries' access to relevant information management of cassava post-harvest losses.

The study examined causes of cassava post-harvest losses among farmers in Imo state.

- Identified sources of information frequently used by farmers on cassava post-harvest losses;

- identified the forms of post-harvest cassava losses;
- determined the causes of post-harvest losses in cassava; and
- examined farmers' involvement in cassava processing

## Methodology

The research was carried out in Imo State, Nigeria. The State has a population of 3,934,899 people and a population density of about 725 people per square kilometre.(NPC, 2021).

It is located at within latitude 4° 45'N and 7°15'N and longitude 6° 50'E and 7° 25'E.The estimated volume of cassava processed annually in the state is 120 tonnes (Okoronkwo, 2020).

The sample for the study was drawn using a multi-stage sampling procedure. The study's population consisted of all cassava farmers in Imo state. The first stage was the purposive selection of all three agro-ecological zones. This was to ensure effective representation, coverage and inclusion of the major agricultural divides of the state. In the second stage, twelve out of the 34 Extension blocks in the state's three agroecological zones were selected using a simple random sampling technique. In the third stage, twenty four out of the 63 farm cells in the zones were selected. That is, two cells each were chosen at random from each of the Extension blocks selected for a total of 24 cells.

In the fourth stage, 5 cassava farmers were selected using a purposive sampling technique from the list of registered cassava farmers in each of the cell to give a total of 120 cassava producers. A Structured questionnaire was used for data collection. Sources of information frequently used were evaluated on a 4-1 rating scale (very often, often, sometimes and never) Also for causes of cassava post-harvest losses (very severe, severe, mild and very mild) and for farmers' involvement in cassava processing (very highly involved, highly involved, slightly involved and not involved) Information on the forms of cassava post-harvest losses was evaluated using multiple responses. .

Data were analysed using percentage, mean and standard deviation.

A mean value of 2.5 was adjudged acceptable for the three variables in the specific objectives above while a mean below 2.5 was not accepted.

## Results and Discussions

### Sources of Information Frequently used by Farmers on Cassava Post-Harvest Losses

Table 1 reveals that phone calls/SMS was the most frequently used ( $\bar{x}$  =3.01) sources of information by cassava farmers to receive information on cassava post-harvest losses. This was followed by radio ( $\bar{x}$  =2.5), video/audio CD ( $\bar{x}$  =2.31). This implies that farmers received and sourced information on cassava post-harvest losses from phone calls/SMS, radio and video/audio CD.

The frequency of use of the sources of information on cassava post-harvest losses was low with a grand mean of ( $\bar{x}$ =1.70), indicating that the farmers do not often use the eight sources of information on post-harvest receive information on post-harvest

cassava losses and it could be that the farmers use information source they have knowledge of and can afford than otherwise. This finding tallies with that of Awotide et al.(2019) that educated farmers source information faster than uneducated ones using information communication technology. Therefore, with improved awareness and knowledge acquisition, the sources of information frequently used by farmers would be more.

**Table 1: Frequency of use of electronic information sources**

Information sources	$\bar{x}$	SD
Mobile phone calls/SMS	3.01	0.95
Software	1.89	0.81
TV	1.99	1.15.
E-mail	1.57	0.57
Web browsing	2.07	1.29
Social media	1.91	0.95
Video/Audio CD	2.31	1.23
Radio	2.5	1.41

**Source:** Field data survey, 2021; SD= Standard Deviation

#### Forms of Cassava Post-harvest Losses

Table 2 reveals that physical loss was 95.64%, followed by economic loss (93.86%) and monetary loss (97.73%). Thus, cassava farmers experienced losses in different forms. These forms were in line with FAO (2021) recently adopted forms. According to FAO (2021), physical loss occurs when fresh/processed cassava products are damaged to the point that they have to be thrown away at all stages of the value chain. This could be a result of poor maturation, poor processing techniques, climate change, diseases/pest attacks and poor storage among others resulting in loss both in weight and quality. Also, economic losses refer to products that have incurred quality deterioration to the point that either their market price is discounted or cannot be used for what they were initially meant for; it can be converted to alternative uses. In monetary loss, it refers to financial loss due to either physical or economic losses including the stolen roots. With a high percentage recorded, it implies that the majority of the farmers experienced these losses at one period or the other.

**Table 2: Forms of cassava post-harvest losses**

Forms	Percentages(n=120)*
Physical Loss (damaged and thrown out roots/processed products)	95.64
Economic Loss (quality deteriorated roots with lower alternative uses)	93.86
Monetary Loss(financial loss in both physical and economic loss including stolen roots)	97.73

**\*Multiple responses. Source:** Field data survey, 2021

### Causes of Post-harvest Losses in Cassava

Table 3 reveals that lack of finance ( $\bar{x}$  =3.56), pest and disease infection ( $\bar{x}$  =3.45) and inappropriate harvesting time ( $\bar{x}$  =3.40) were the most important identified causes of cassava post-harvest losses. Lack of finance could affect the procurement of adequate storage, processing and marketing facilities and without these facilities; harvested roots might be exposed to pest and diseases causing physical deterioration of the roots and cassava products. Inappropriate harvesting time was identified as a cause of post-harvest losses because this could affect the weight and quality of cassava root. All the mean scores were above 2.50 which was the established benchmark for decision making. By implication, all the causes identified by cassava farmers were deemed serious, for instance, lack of finance to process the cassava into more shelf stable products such as garri can lead to slow deterioration of the cassava tubers until it finally decays. This is a very serious post-harvest problem mostly found in rural areas where money is a problem. Pest and disease attack is also a very serious cause of cassava post-harvest losses faced that can reduce the nutritional quality of cassava. According to Prempeh et al (2017), pest and diseases (pathogens) were among the main causes of post physiological deterioration in cassava as perceived by the farmers

**Table 3: Causes of cassava post-harvest losses.**

Causes of post-harvest losses	$\bar{x}$	SD
Lack of finance	3.56	0.61
Problem of marketing facilities	3.30	0.83
Poor/bad Weather	2.93	0.77
Inadequate information on value addition	3.13	0.80
Pest and disease infection	3.45	0.67
Losses through transportation	3.10	0.87
Poor storage	3.46	0.67
Inappropriate harvesting time	3.40	0.76
Pilfering	3.30	0.94

**Source:** Field data survey,2021; SD= Standard Deviation

### Involvement in Cassava Processing

Table 4 shows that cassava farmers were highly involved in processing cassava into garri ( $\bar{x}$  =3.86), fufu ( $\bar{x}$  =3.76) , Tapioca ( $\bar{x}$  =3.23) having a mean score above the cut-off point of 2.5. However the farmers indicated that they were virtually not involved in processing cassava root to flour ( $\bar{x}$  =1.90), starch for paper ( $\bar{x}$  =1.43), sweeteners ( $\bar{x}$  =1.43) and alcohol ( $\bar{x}$  =1.30) Farmers could be involved in garri, fufu and tapioca as a result of their economic advantage over the other products available. This implies that with better economic advantage especially in the area of cassava processing techniques, more farmers would be involved, post-harvest losses reduced and the quality of cassava products improved through value addition. This tallies with the work of Maduka et. al. (2019), that post-harvest value addition and technology helped to reduce waste. The knowledge gap in the involvement of the processing of cassava into different products among the respondents can cause wastage of cassava roots as the farmer may discard them as being non-useful when physically deteriorated.

**Table 4: Involvement in cassava processing**

<b>Cassava products</b>	$\bar{x}$	<b>SD</b>
Garri	3.86	0.34
Fufu	3.76	0.57
Tapioca ( cassava flakes)	3.23	0.99
Starch	2.30	1.13
Flour	1.90	1.16
Animal feed	2.30	1.32
Starch for paper	1.43	1.02
Sweeteners	1.43	0.99
Alcohol	1.30	0.82

**Source:** field data survey, 2021; SD= Standard Deviation

### **Conclusion and Recommendations**

Farmers' sources of information on cassava post-harvest losses management are phone call/SMS and video/CD. It was discovered that farmers experienced physical, economic and monetary forms of post-harvest cassava losses at different periods. Also, most of the farmers were involved in processing cassava into garri, fufu and tapioca. Causes of cassava post-harvest losses are very serious ranging from lack of finance, pest/disease infection and inappropriate harvesting time among others to poor/bad weather. To reduce cassava post-harvest losses, cassava processing must be introduced through conversion of cassava roots to different products that are market driven. Farmers should be granted loans and credit facilities and be encouraged to raise funds through joining cooperatives.

### **Reference**

- Anyoha N.O. and Anaeto C.F. (2020) Agricultural extension: A veritable tool for achieving sustainable development Goals. In Chigozie C. Asiabaka and Ihuoma P. Asiabaka (eds.) *Management Systems and Multi-disciplinary Perspective*. Nigeria. University of Calabar Press. P.145.
- Awotide, Abdoulaye, Alene and Manyong (2019). Nigeria at a glance. Socioeconomic factors and smallholder cassava farmers access to credit in South western Nigeria *Tropicultura (Enligne)*37(1).
- .Fondong, V.and Rey, C. (2018).Recent biotechnological advances in the improvement of Cassava .Pp.139-161. IntechOpen.
- Food and Agriculture Organisation (2019). Nigeria at a glance. Retrieved from <http://www.fao.org/nigeria/fao-in-nigeria/Nigeria-at-a-glance/en/>.
- Food and Agriculture Organisation (2021). Addressing Post-harvest losses in cassava. Retrieved from <http://www.fao.org/3/V4510E/V45>
- Maduka,O.A, Odoemelam, L.E., Onu, S.E. and Ukoha, J.C. (2019). Perceived Effect of Postharvest and Value Addition Technologies on cocoa farmers' Productivity in Akwa Ibom State. *Journal of Agricultural Extension* 23(4) 85-88.
- National Population Commission (2021). Report on Estimated Population as of 2021 In Nigeria. National Population Commission Abuja, Nigeria.

- Okoronkwo, F.C. (2020) Production and Processing Function among Female Cassava Farmers in Ohaji/Egbema LGA,Imo State. *Nigeria Agriculture Journal* 51 (3)
- Prempeh, R, Manu-Adeuening, J.A., Asante, B.O., Asante, I.K. (2017)Farmers' Knowledge and Perception of Post-harvest Physiological Deterioration in Cassava Storage Roots in Ghana. *Agriculture and Food Security* 6(1).s