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ANALYSIS OF PERCEPTION AND THE LEVEL OF USE OF IMPROVED PROCESSING AND STORAGE FACILITIES AMONG RURAL WOMEN IN KWARA STATE, NIGERIA.

Olooto, F.M., Olatinwo, L. K., Ojo, J. A., Abdulrahman, O. L. and Akintola, B. O.
Department of Agricultural Economics and Extension Services, Faculty of Agriculture, Kwara State University Malete, Nigeria.
*Correspondence: feliciamolooto@gmail.com, +2347030918979

ABSTRACT

This research was carried out to assess the perception and the level of use of improved processing and storage facilities among rural women in Kwara State. Specifically, the study described socio-economic characteristics of rural women, assessed the frequency of use and ascertained perception of women on the use of improved processing and storage facilities. A three stage sampling procedure was used to select 160 rural women from who data was collected using structured interview schedule. Data collected were analyzed using frequency counts, percentages, mean and Pearson Product Moment Correlation (PPMC). Findings revealed that 60.6% were aged above 50years, 79.4% were married, 48.8% had no formal education while 62.5% were non-member of cooperative society. PPMC analysis between socio-economic characteristics and the use of improved processing/storage facilities among rural women indicated that level of formal education ($p=0.002$, $r=0.240$) and membership of agricultural society ($p=003$, $r=0.237$) showed positive significant relationship while age ($p=0.000$, $r=-0.299$) and marital status ($p=0.000$, $r=-0.308$) showed negative significant relationship at $p<0.05$ level of significance. The study concluded that women in the study area were low users of improved processing and storage facilities despite having favourable perception towards using them. It was therefore recommended that extension service should engage in training women and dissemination of affordable processing and storage technologies to the rural communities.

Keywords: Processing, Storage, Rural women, Improved, Perception

INTRODUCTION

In agricultural processing, agricultural food is subjected to mechanical, biological, physical, and biochemical manipulations in order to preserve it for future use. Processing also involved transformation of raw food materials to edible forms. Storage refers to the process of preserving agricultural materials' quantity and quality for a set amount of time beyond their usual shelf life in order to preserve them from deteriorating. Any deposit or keeping of agricultural products, fertilizer, grains, feed, and other associated supplies in buildings or containers is referred to as agricultural storage. This is sometimes done to avoid contamination or to hold supplies during periods when output cannot keep up with demand. Keeping and processing commodities from the moment of production till they are required for consumption is a crucial marketing function. It takes a variety of instruments and methods to turn farm produce into different goods using technology (Fatuase et al., 2019).

It involves the series of operations taken to change agricultural products into a consumer-finish product. In agricultural processing, agricultural products are modified using both conventional and scientific methods to increase their usefulness and enable storage for future uses. Processing helps to make food available even during the off-season. When food is processed it taste and look very attractive. Food crop processing, such as dehydration, eliminates microorganisms, reducing spoilage and enhancing the shelf life of food crop products. Value-adding technologies in cassava processing have the potential to significantly boost cassava consumption, diversifying its uses, and use it to enhance farm families' livelihoods through the creation of jobs, micro-enterprises, revenue generation, and bolstering the economies of rural households. (Okebiorun & Jatto, 2017).

Processing adds value to the agricultural produce. Processing contributes to a nation's foreign exchange earnings as well as individual income. Additionally, it makes room for commercial agriculture, which encourages farming. More food will be available in our food reserve if processing is done on a regular and sufficient basis, which will help with climate change adaptation and mitigation. Processing provides raw materials for industrial uses. Certain materials—known as by-products—are created during processing that can be utilized to make animal feed.

Rural women play a critical role in order to bring about the revolutionary social, environmental and economic transformations necessary for sustainable development. They however, confront numerous difficulties such as restricted access to financing,

healthcare, and education. These issues are made worse by the world's food and economic crises as well as climate change. Most of the labor involved in cultivating and processing cassava in Nigeria is done by women (Forsythe et al., 2016).

A sizable amount of farm product is wasted each year due to inadequate processing and storage facilities, or farmers are compelled to sell their produce at a loss during down markets, earning minimal profit. Rodents and other pests, as well as general deterioration, cause the loss of almost 20% of food produced before it reaches the consumer. One of the quickest ways to boost food security is through improved storage.

According to Njagi & Wainaina, (2018), half of fruits and vegetables are lost before they reach the market, compared to 40% of roots and tubers. Food waste, which costs billions of dollars worldwide each year, can result from improper food storage, which can also cause mold and bacteria growth, natural food deterioration, and several other issues.

Majority of farm produce are lost to pest, rodents, and deterioration, and due to the lack of proper post-harvest processing and storage (Bolarin and Bosa, 2015). The use of outdated seed storage techniques or a lack of commercial grain storage facilities and their management are the two main causes of the large-scale grain storage problem. In addition to creating shortages, inadequate contemporary storage facilities hinders agricultural commodity exports. Utilizing improper or leaky containers, combining incompatible chemicals in one container, and using unsecured or inadequate containers are common storage problems.

Inhibiting metabolic reactions and limiting bacterial or fungal penetration are the two main objectives of food preservation. The method enables increased shelf life extension while minimizing waste. Some of the popular conventional preservation techniques like heating, drying and freezing have been implemented in large industries (Pereira et al. 2018; Białkowska et al. 2020; Said 2020). However, research has shown that heat treatment and freezing have some disadvantages, including food shrinkage, texture, nutritional loss, and organic property loss, which results in a significant loss in the food product as a whole. (Jayasena et al. 2015).

However, as the population grew and consumer standards and needs for healthy and nutritious food increased, food safety and security became a top priority (Saravanan et al. 2020). Consequently, the idea of food storage and preservation spread quickly with the goal of providing food for all. Over time, tasks that were previously performed primarily by men are increasingly being taken up by women. Studies have shown that rural women are usually disadvantaged in their access to all factors of agricultural production and processing (Mbah et al. 2017, Olawoye, 2000, Dwomoh et al. 2023). This study is therefore designed to provide answers to the following questions:

1. What is the level of use of the improved processing and storage facilities among the respondents?
2. What is the perception of respondents towards the use of improved processing and storage facilities?

Objectives of the study

The main objective of the study is to investigate level of use of improved processing and storage facilities among rural women in Kwara state. The specific objectives are as follows:

1. Assess level of use of modern processing and storage facilities among respondents
2. Examine respondents perception about the use of improved processing and storage facilities

Hypothesis of the study

The following hypothesis was tested to determine the relationship between variables in the study:

1. There is no significant relationship between selected socioeconomic characteristics and use of improved processing and storage facilities.

MATERIALS AND METHODS

Study area: The study was carried out in Kwara state, Nigeria. Kwara state is located in the North central zone of Nigeria. It is bordered to the east by Kogi state, to the north by Niger state, and to the south by Ekiti, Osun and Oyo states. Its western border makes up part of the international border with Benin Republic. The capital of Kwara state is the city of Ilorin and the state has 16 local government areas. Kwara state was created on 27 May 1967 with total area of 36,825km2 (14,218 square miles). Kwara state is the ninth largest in area, but the sixth least populous, with an estimated population of about 3,551,000 as at 2022. Geographically, Kwara state is split between the West Sudanian savanna in the east, and the Guinean forest-savanna mosaic eco-region in the rest of the state.

Population of the study: The population of this study includes all women in rural communities of Kwara state, Nigeria.

Sampling procedure and sample size: A three stage sampling procedure was used for selecting respondents for the study. At first stage, 50% of the ADP zones (i.e two out of four zones) were randomly selected, and then one Local Government Area (LGA) was selected from each zone. At the second

stage, 4 rural communities were randomly selected in each LGA using the KWADP village listing as sampling frame, giving a total of 8 communities. Lastly, 20 women were selected in each community through systematic sampling procedure. In all, a total of 160 respondents were used for the study.
Selected zones: Zone C: and Zone D:
Selected LGAs: Zone C: Moro Local Government Area; Zone D: Oyun LGA.

Table 1: Sampled communities and respondents

Zones	LGAs	Communities	Selected sample
		1. Shao	20
Zone C	Moro	2. Ashomu	20
		3. Olooru	20
		4. Bode Saadu	20
Zone D	Oyun	1. Erin-Ile	20
		2. Ojoku,	20
		3. Ilemona	20
		4. Igosun	20
Total		**8**	**160**

Method of data collection and analysis: A well-structured interview schedule was used to collect data from the respondents. The interview schedule was divided into sections based on the objectives of the study. Trained enumerators were used to collect the data. The data were analyzed using descriptive statistical tools (frequency counts, percentage and mean) while Pearson Product Moment Correlation (PPMC) was used for the testing of hypothesis. Level of use was measured by listing available improved methods and asking respondents to indicate how often they use them. Scores were assigned from: Always (4), Sometimes (3), Occasionally (2) and Never (1). Highest possible score was 28 while 7 was the lowest score; scores below 18 is considered LOW while scores 18 and above is considered HIGH.

RESULTS AND DISCUSSION

The results presented in Table 2 indicated that majority (60.6%) of the respondents were aged at 50years and above. The average age of the respondents was 56.6years. This implies that rural women in the study area are in their old age and may soon be unable to perform some strenuous activities involved in agro-processing. This is a result of rural-urban drift thereby leaving agro-processing in the hands of the aged women in the study area. Information supplied on education showed that significant number of the respondents (48.8%) had no formal education while others had primary education (39.4%) and secondary education (11.9%). This shows that more than half of the respondents can read and write. This can enhance extension communication and feedback on improved processing technology adopted. This finding conforms to the report by Falola *et al.* (2022) who found that rural women in Kwara State had formal education.

Further information provided by the respondents on marital status indicated that majority (79.4%) were married with average household size of approximately 8 persons. This indicates that women in the study area have household responsibilities. It is anticipated that this will have a favorable impact on the adoption of improved facilities, which has a strong potential to boost productivity and revenue to support family members. This finding also agrees with report by Falola et al. (2020) that rural women in Kwara State are mostly married.

Unfortunately, majority of the respondents were non-members of cooperative societies (62.5%) and agricultural society (85.0%). Compared to individuals who were members of a group, this result suggested that the women work independently without assistance from one another. The result is in agreement with the findings of Sajuyigbe, Eniola, Adebanji & Oladejo (2021) that there is low level of participation in cooperative activities among rural women.

Socioeconomic Characteristics of Respondents

Table 2: Socioeconomic characteristics of respondents (n=160)

Variables	Frequency	Percentage	Mean±SD
Age(years)			
≤30	2	1.3	
31–40	19	11.9	56.6±13.54
41–50	42	26.3	
Above50	97	60.6	
Level of formal education			
No formal education	78	48.8	
Primary education	63	39.4	
Secondary education	19	11.9	
Tertiary education	0	0.0	
Marital Status			
Single	0	0.0	
Married	127	79.4	
Divorced	3	1.9	
Widowed	30	18.8	
Household size			
≤5	54	33.8	
6–10	79	49.4	7.8±4.27
11–15	18	11.3	
Above15	9	5.6	
Years of residence in the community			
Less than5	7	4.4	
6–10	1	0.6	
11–15	2	1.3	
16–20	150	93.8	
Membership of Cooperative society			
Yes	60	37.5	
No	100	62.5	
Membership of agricultural society			
Yes	24	15.0	
No	136	85.0	

Source: Field survey, 2023

The respondents' frequency of use of improved processing and storage facilities are presented in Table 3. The table showed that the use of fridge/freezer (mean=3.31) ranked first, use of mechanized shelling (mean=3.22) ranked second while hand operated machine (mean=3.17) ranked third. This implies that use of fridge/freezer, use of mechanized shelling and hand operated machine were the fore most improved processing and storage facilities used by women in the study area. This could be due to cost or availability of these facilities in the study area.

Table 3: Frequency of use of improved processing and storage facilities

Improved method	**Always**	**Sometimes**	**Occasionally**	**Never**	**Mean**	**Rank**
Fridge/freezer	105(65.6)	23(14.4)	9(5.6)	23(14.4)	3.31(1.09)	1st
Mechanized shelling	80(50.0)	47(29.4)	21(13.1)	12(7.5)	3.22(.94)	2nd
Hand operated machine	90(56.3)	20(12.5)	37(23.1)	13(8.1)	3.17(1.05)	3rd
Metal Silo	12(7.5)	0	4(2.5)	144(90.0)	1.25(.80)	4th
Hybrid Dryer	3(1.9)	6(3.8)	7(4.4)	144(90.0)	1.18(.58)	5th
Improved Crib	4(2.5)	5(3.1)	4(2.5)	148(92.5)	1.16(.59)	6th
Super grain bags/Hermetic method	3(1.9)	5(3.1)	4(2.5)	148(92)	1.14(.55)	7th

Source: Field survey, 2023

Respondents were grouped as low or high according to score obtained. The grouping in Table 4 showed that 11.3% were grouped as high users while 88.8% were grouped as low users. By implication, rural women in the study area were low users of improved processing and storage facilities.

Table 4: Level of use of improved processing and storage facilities

Level	Score range	Frequency	Percentage	**Mean**	**Std. Dev.**
Low	7–17	142	88.8	14.4	3.32
High	18–28	18	11.3		
Total		**160**	**100.0**		

Minimum to maximum possible score = 7–28

Table 5: Perception of rural women on the use of modern storage/processing facilities

Statements	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Mean	Decision
Modern facilities are costly	125(78.1)	32(20.0)	0	3(1.9)	0	4.74(.55)	F
I don't have technical skills to operate modern facilities	32(20.0)	97(60.6)	2(1.3)	24(15.0)	5(3.1)	3.79(1.03)	F
It is not easy to construct modern facilities	84(52.5)	30(18.8)	0	31(19.4)	15(9.4)	3.86(1.46)	F
Modern facilities are easily accessible/available	38(23.8)	28(17.5)	1(0.6)	57(35.6)	36(22.5)	2.84(1.54)	U
I am not aware of any modern storage facility	1(0.6)	1(0.6)	1(0.6)	68(42.5)	89(55.6)	1.48(.61)	U
I don't need any storage facility for my household	0	1(0.6)	0	74(46.3)	85(53.1)	1.48(.54)	U
Regular power supply is not available to operate modern facility in my community	73(45.6)	31(19.4)	1(0.6)	37(23.1)	18(11.3)	3.65(1.51)	F
Modern storage facility can help improve my household food security	133(83.1)	23(14.4)	0	0	4(2.5)	4.76(.70)	F
Modern facilities cannot be managed in my community	0	2(1.3)	3(1.9)	81(50.6)	74(46.3)	1.58(.60)	U
Adequate security is not available in my community for modern facilities	0	0	0	54(33.8)	106(66.3)	1.34(.47)	U

Source: Field survey, 2023
F-Favourable perception (mean>3.0), U-Unfavourable perception (mean≤3.0)

Perception of rural women on the use of modern storage/processing facilities

Results on perception of rural women on the use of modern storage/processing facilities in Table 5 shows that respondents have favourable perception on the following statements: Modern facilities are costly (mean=4.74), I don't have technical skills to operate modern facilities (mean=3.79), It is not easy to construct modern facilities (mean=3.86), regular power supply is not available to operate modern facility in my community (mean=3.65) and modern storage facility can help improve my household food security (mean=4.76) while they indicated unfavourable perception to statements on modern facilities are easily accessible/available (mean=2.84), I am not aware of any modern storage facility (mean=1.48), I don't need any storage facility for my household (mean=1.48), Modern facilities cannot be managed in my community (mean=1.58) and Adequate security is not available in my community for modern facilities (mean=1.34).

Test of Hypothesis

H0: There is no significant relationship between socio-economic characteristics and the use of improved processing/storage facilities among rural women.

Table 6: PPMC results of the relationship between socio-economic characteristics and the use of improved processing/storage facilities among women

Use of improved processing/storage facilities	**Coefficient(r)**	**Sig.(p)**
Age (years)	-0.299*	0.000
Level of education	0.240*	0.002
Marital Status	-0.308*	0.000
Household size	0.119	0.135
Religion	-0.043	0.587
Years of residing in the community	-0.107	0.178
Membership of cooperative society	0.006	0.942
Membership of agricultural society	0.237**	0.003

*Significant at 0.05level

Result of PPMC analysis between socio-economic characteristics and the use of improved processing/storage facilities among rural women as presented in Table 6 indicated that level of formal education (p=0.002, r=0.240) and membership of agricultural society (p=003, r=0.237) showed positive significant relationship with the use improved processing/storage facilities among rural women. Age (p=0.000, r=-0.299) and marital status (p=0.000, r=-0.308) showed negative significant relationship with the use improved processing/storage facilities among rural women at $p<0.05$level of significance. These findings indicated that increase in years of schooling and membership of agricultural society will increase the use of improved processing/storage facilities among rural women while old age results in decreased use of improved processing/storage facilities among rural women. The result corroborates the report of Adesope et al. (2010) and Adeniyi et al. (2023) who found that education and age significantly influence women's adoption and use of improved processing technologies.

CONCLUSION AND RECOMMENDATIONS

Based on its main findings, the study's main conclusions were that the women in the study area were old and non-cooperators. Women in the study area were also low users of improved processing and storage facilities. Therefore most improved processing and storage facilities used by women agro-processors were fridge/freezer, use of mechanized shelling and hand operated machine. The women also showed favourable perception for the use of improved processing and storage facilities. The following recommendations were therefore suggested:

1. More extension outreach in the study area to train women on the use of improved processing/storage facilities.
2. The women should also be encouraged to join agro-processing groups or start one where not existing.
3. There should be provision of improved processing and storage facilities for women in the study area at subsidized rate.

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