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ASSESSMENT OF SOURCES OF INFORMATION ON POST-HARVEST TECHNOLOGIES AND LEVEL OF UTILIZATION AMONG CEREAL CROP FARMERS IN BENUE STATE, NIGERIA

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Abstract
The study assessed sources of information on post-harvest technologies and utilization among cereal crop farmers in Benue State. The population of the study consisted of all cereals farmers in Benue State. A multi-stage sampling procedure was used to select 215 respondents. Data for the study were collected using questionnaire, interview schedule. Data for the study were analysed using both descriptive and inferential statistics. Results on sources of information revealed that 100% got their information from friends. Results on level of use of post-harvest technologies showed that, winnowing($\bar{x}$=3.93), drying ($\bar{x}$=3.86) and storage($\bar{x}$=3.78), respectively were the most used post-harvest processing technologies. Based on the findings of this research, the study concluded that there was high utilization of winnowing, may be attributed to the ease of the technology and farmers attempt to get quality grains for storage. The study recommended that, they should be more awareness on the use of social media platforms to obtain more information on the use of post-harvest technologies.

Keywords*: Assessment, Sources, Information, Post-harvest, technologies, Utilization*

1.0 Introduction

Cereals or grains belong to the monocot family of *Poaceae* or *Gramineae* and are cultivated widely to obtain the edible components of their seeds (Adam, 2022). Botanically, cereals are called *Caryopsis* and are structurally divided into endosperm, germ and bran. Cereal grains are cultivated in huge quantities and provide more food energy than any other type of crop; hence they are known as staple crops in Nigeria. From time immemorial, cereals have provided unlimited health benefits to mankind as a staple food in our diet. Cereals are rich in complex carbohydrates that provide man with ample energy and help to prevent cancer, constipation, colon disorders, also enrich man's overall health with abundant proteins, fats, lipids, minerals, vitamins and enzymes (Adam, 2022).

Cereals are enriched in niacin, iron, riboflavin and thiamine and most cereals have abundant fibre contents, especially barley, oat and wheat. Cereals, also, have soluble bran that aids in lowering blood cholesterol and keeping heart diseases at bay. Cereal consumption also means an intake of high amounts of protein; breakfast cereals are often eaten with milk that makes for a protein-rich meal. For infants, iron-fortified cereals are said to be the premium solid food (Adam, 2022). The most familiar grains used for making this category of cereal food include rice, maize, ragi, bajra, wheat, barley, sorghum, Italian millets and oats. Some of the most widely cultivated cereal species in Benue State, Nigeria include rice, maize, millet and sorghum, which positively contributed to the social status of many farmers.

Post-harvest technology is interdisciplinary science and technique applied to agricultural produce after harvest for conservation, processing, packaging, distribution, marketing and utilization to meet the food and nutritional requirements of people in relation to their needs (Mirza, 2014). Efficient techniques for harvesting, conveying/transportation, handling, storage, processing/preservation, packaging, marketing and utilization are components of the post-harvest value chain (Mirza, 2014). The role of post-harvest technologies in agricultural production cannot be over-emphasised, post-harvest technologies enhance agricultural production by reducing post-harvest losses to the nearest minimum, improve nutrition, add value to agricultural produce by opening new marketing opportunities, has potential to create rural industries, increasing land and labour productivity to enhance total production, generating new jobs and enhance other related economic sectors for viable growth (Mirza, 2014).

2.0 Objectives of the Study

The broad objective of the study was to assess sources of information on post-harvest technologies and utilization among cereal crop farmers in Benue State, Nigeria. The specific objectives were to:

i. identify sources of information on post-harvest technologies among the respondents.
ii. determine the level of use of post-harvest technologies in processing cereal crop produce among cereal crop farmners.

3.0 Methodology

The study was carried out in Benue State, in the Middle-belt region of Nigeria and it is located between Longitudes 70 and 100 East of the Greenwich Meridian and Latitudes 60 25' N and 80 8' of the equator (Wikipedia, 2023). Benue State is named after Benue River and was formed from the former Benue-Plateau State in 1976. The State has a total land mass of about 33,955km square and human population of 4, 253, 64 (National Population Census, 2006) and 6,141,300 (population projection, 2022). It is divided into three geo-political zones: A (North Eastern zone), B (Northern western zone) and C (Southern zone), with a total of 23 Local Government Area (LGAs). It is bounded by Nasarawa State in the North, Taraba State in the East, Cross -River State in the South, Enugu State in the West, Kogi State in the South-west and Cameroon Republic in the South-east (Ani *et al.,* 2014).

It is an agrarian State with a large percent of the populace, who are involved in agriculture, hence its slogan, “Food Basket of the Nation”. It is blessed with rich fertile land and favourable climatic conditions suitable for wide range of crops and animals production. Rainy season lasting from April to November and Dry season lasting from December to March. Major crops cultivated in the State are yam, cassava, maize, rice, sorghum, millet, benniseed, pepper, soya beans, tomatoes and tree crops such as mangoes, cashew, oranges and pears. Livestock such as poultry, goats, sheep, pigs and cattles are also reared. Farming is dominated by the middle aged men who marry several wives to help in cultivation of large farmland (Okwu and Daudu, 2011).

Major tribes in the State are Tiv, Idoma, Igede and Etulo. The land is generally low lying (average 100m-250m) and gently undulating, with occasional inselbergs, knoll,laterite among others. It is only at the boundary area with Cameroon, Kwande and Oju Local Government Areas that hilly terrain with appreciable local relief is encountered. Here, the terrain is characterised by steep slopes, deep incised valleys and generally rugged relief (Wikipedia, 2023).

The population of this study comprises all registered cereal crop farmers in Benue State, Nigeria. The sample size of 215 respondents was selected using a multi-stage sampling procedure viz stratified, purposive and simple random sampling techniques. In the first stage, the population of the study was stratified into three already existing agricultural zones: North-Eastern, North-Western and South-Western zones, respectively. During the second stage, two LGAs were purposively selected from each of the agricultural zones as: North-Eastern agricultural zone- Ushongo and Katsina- Ala, North-Western zone Markurdi and Buruku and South-Western zone Oju and Okpowu due to high cases of losses post- harvest giving a total of six LGAs. In the third stage, two rural communities were purposively selected from each of the six LGAs due to their dominant use of post-harvest technologies. Finally, a sampling frame was developed for each of the L.G.As and using allocation of 0.001% across board a total sample size of 215 respondents was selected for the study. Data for this study were collected from primary source through the use of well-structured questionnaire.

Data for the study were analysed using both descriptive and inferential statistics. Descriptive statistics such a frequency, percentage and mean were used as well as Logit regression analysis were used.

4.0 Results and Discussion

4.1 Sources of Information on Post- harvest Technologies

Table 1 revealed sources of information, friends (100%) and neighbours (97.67%) among others. Majority (100%) of the respondents obtained information from friends. Friends and fellow farmers can be a valuable source of information on post-harvest technologies; they may have first-hand experience with various techniques and equipment and can offer practical advice and insights. This may be due to the fact that farmers easily get persuaded about agricultural information from people closer to them that they can trust than from external sources. This implies that, the respondents got their information mostly from informal sources. The finding is in line with Onuekwusi and Atasie (2011) that friends, neighbours and family relatives were available sources of information among farmers.

Table 1: Sources of Information on Post-harvest Technologies of Cereals (n=215)

Sources of information	*Frequency	Percentage
Friends	215	100
Neighbours	210	97.67
Mass media	202	93.95
Other farmers	199	92.67
Community leaders	168	75.35
Opinion leaders	127	59.07
Cooperative societies	90	41.86
Contact farmers	79	36.74
Face-book	48	22.33
WhatsApp	37	17.21
Extension agents	23	10.70
NGOs	19	8.84
Pamphlet	18	8.37
YouTube	9	4.19
Input dealers	6	2.79
Telegraph	4	1.86

*Multiple responses

4.1 Level of use of Post-harvest-Technologies

Table 2 revealed that, winnowing ($\bar{x}$=3.93) was mostly utilized by the respondents. Manual winnowing was mostly utilized because it was a simple technology used in separating the seeds from chaff. After winnowing, farmers can store their grains in bags of various sizes. The level of high utilization of winnowing may be attributed to the ease of the technology and farmers' attempt to get quality grains for storage. This could be an added advantage for the respondents to quickly understand and adopt innovations that will reduce post- harvest losses to a minimum level. This is in tandem with the finding of Nwaru (2004) that manual winnowing technology allows farmers to always utilized it because of its availability to tackle farming problems.

Table 2: Level of Use of Post-harvest Technologies (n=215)

PHT activities	Not at all	Low	Moderate	High	Mean	Sd	Remarks
Winnowing		2(0.95)	11(5.14)	202(94.39)	3.93	0.29	UMT
Drying		1(0.47)	26(12.21)	186(87.32)	3.86	0.35	UMT
Storage	2(0.94)	1(0.47)	39(18.40)	170(80.19)	3.77	0.48	UMT
Threshing	12(5.66)	105(49.53)	90(42.45)	5(2.36)	2.41	0.63	NUMT
Separation	24(11.37)	145(68.72)	42(19.91)		2.08	0.55	NUMT
Sorting	21(10.24)	165(80.49)	18(8.78)	1(0.47)	1.99	0.45	NUMT
Milling	82(38.86)	66(31.28)	62(29.38)	1(0.47)	1.91	0.83	NUMT
Cleaning	50(23.70)	141(66.82)	20(9.48)		1.85	0.56	NUMT
Grading	104(49.52)	98(46.67)	8(3.81)		1.54	0.57	NUMT
Parboilng	157(75.85)	25(12.08)	25(12.08)		1.36	0.68	NUMT
Fermentation	192(91.00)	17(8.06)	2(0.95)		1.09	0.33	NUMT

Key:

Cut off mean=2.50

UMT= Utilized most times

NUMT= Not utilized most times

5.0 Conclusion and Recommendations

5.1 Conclusion

The study concluded that the level of high utilization of winnowing may be attributed to the ease of the technology and farmers' attempt to get quality grains for storage and also the integration of post-harvest technologies into cereal farming has positively impacted the social status of farmers, enhancing their economic well-being, food security and community standing.

5.2 **Recommendations**

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

1. They should be more awareness on the use of social media platforms to

obtain more information on the use of post-harvest technologies.

2. Farmers should be encouraged to also use other post-harvest technologies frequently to enhance more efficiency and greater productivity.

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