FARMERS' PERCEPTION ON BENEFITS ASSOCIATED WITH POST-HARVEST MANAGEMENT PRACTICES OF SELECTED CROPS IN KOGI STATE OF NIGERIA

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ABSTRACT

Post-harvest losses are accountable for more than half of agricultural produce in Sub-Saharan Africa. The study determines farmers' perception on the benefits associated with post-harvest management practices of selected crops in Kogi State of Nigeria. Sample size of 160 farmers were selected using multi-stage sampling procedure. Structured questionnaire was used for data collection. Data were gathered on level awareness on post-harvest management practices, farmers' perception on the benefits of post-harvest management and challenges faced in practicing post-harvest management. Data were analysed using frequency, count, percentage and mean. The result revealed that the mean age of farmers was 43 years with mean farming experience and annual income of 28.9 years and N414,012 respectively. All (100%) of the farmers were aware of all the methods of post-harvest management in yam and maize. Farmers agreed that post-harvest management increase farmers' standard of living (67.5%), post-harvest management is good for meeting farmers need in time of food scarcity (60.6%) and post-harvest management meet farmers daily food needs (60.6%). Shortage of fund (98.1%), high cost of post-harvest material (94.4%) and transportation challenge (93.8%) were the major challenges faced in practicing the post-harvest management. It can be concluded that increase in standard of living and meeting farmers need in time of scarcity were the most benefits associated with post-harvest management. It is recommended that farmers should pull their resources together in order purchase cost friendly infrastructures for their produce. Farmers should leverage on the traditional management practices to save cost.

Keywords: Post-harvest management, Farmers, Post-harvest equipment, Yam, and Maize

INTRODUCTION

Larger proportions of farmers in Nigeria depend on agriculture as a means of their livelihoods. Farming families produce diverse crops such as maize, rice, sorghum, millet, cowpea, groundnuts, soya beans, yam, cassava, plantain, vegetable and fruits in order to boost food security and income generation (Pelemo, Mohammed, Omaku and Opara, 2019). Despite the increase in production of the crops, the post-harvest losses encountered cannot be over-emphasised. These losses are attributed to inadequate post-harvest practices. Post-harvest can be defined as stage of crop production immediately after harvesting. It involves stages such as drying, shelling, cleaning, sorting and packing (UCDavis Sustainable Agriculture and Research Education Programme, 2021). Post-harvest management practices are methods used in adding value agricultural produce after harvesting to preserve, conserve, quality control processing, packaging, storage, distribution, marketing, and utilization to meet the food and nutritional requirements for the populace. The roles of post-harvest management among rural farming populace includes reduction in losses, value addition, opening a market opportunity, job creation and sources of materials to other sectors. Nigeria fertile land paves way for most crops to thrive well (Ahungwa and Ahungwa, 2020). Agricultural sector has enhanced economic development of the country by absorbing more labour force engaged in full or part-time farming. About 50% of agricultural produce waste away due to poor management practices (Musa, 2020). This scenario often forces farmers to sell most of their produce immediately after harvesting and later bought back at skyrocketed prices a few months after harvesting. The losses encountered by farmers may be due to low level of awareness on the various management practices, inadequate knowledge on the benefits of post-harvest management practices and challenges faced in the utilization of post management practices due to inadequate knowledge by rural farming populace. Adoption of post-harvest management practices among the farming populace is expected to address issues raised above to barest minimum. Also, having right knowledge on the post-harvest management and utilization is expected to reduce losses, poverty and enhance the livelihood status of rural farming populace. It is therefore necessary to determine farmers' perception on the benefits of postharvest management practices in order to ascertain the level of utilization of the practices among rural farmers. The specific objectives are therefore to:

i. examine farmers' awareness on post-harvest management of selected crops in the study area;
ii. determine farmers' perception on the benefits of post-harvest management of the selected crops; and
iii. identify challenges associated with post-harvest management in the study area.

METHODOLOGY

This research was carried out in Kogi state. The state is located in the Guinea savannah ecological zone of Nigeria, located between latitude 6^0 33' and 8^0 44'N and longitude 5^0 22' and 7^0 49'E.

Kogi state has a total population of 3,278,487 in (NPC, 2006) and with growth rate of 3.2%, the State has estimated population of 4,636,071 in 2017. The State has land area of about 30,354.74 square kilometres (Kogi State Ministry of Information Working Document, 2016). The State has about 2 million hectares of cultivable land with only about 0.5 million hectares currently under cultivation (Kogi State Ministry of Information working document, 2016). The State is well endowed with river valleys and swamp lands for dry season farming. The major food crops grown in the State are yam, cassava, maize, sorghum, rice, millet, cowpea, pigeon pea, groundnut, bambaranut, cocoyam, sweet potato, beniseed, melon, banana, plantain and cotton. Fruits and leafy vegetables such as okra, pepper, fluted pumpkin and spinach are highly cultivated in the area. Tree crops grown in the State are cashew, oil palm, citrus, cocoa, coffee and kolanut. Cattle, sheep, goats, and poultry are the major animals reared. Fish is common along the riverside areas (Kogi State Ministry of Information Working Document, 2016).

Multi-stage sampling procedure was used for this study. The first stage involved selection of three (3) agricultural zones out of four (4) agricultural zones in the state, using simple random sampling technique. The second stage involved the selection of one (1) Local Government Area (LGA) from each of the zones making a total number of three (3) LGAs from the selected agricultural zones using simple random sampling technique. The third stage involved simple random technique in the selection of four (4) villages each from the selected LGAs making a total of twelve (12) villages. The fourth stage involved proportional section of 10% of the farmers from one thousand five hundred and thirty-seven (1537**)** sampling frame, giving an approximated total of one hundred and sixty respondents (160) sample size.

Table 1: Sample distribution of the farmers in the study area

State	Agricultural Zones	LGAs	Villages	Sampling Frame	Sample Size (10%)
Kogi state					
	Zone A	Yagba East	Alu	198	20
			Ponyan	172	17
			Ejuku	147	15
			Oranre	110	11
	Zone B	Dekina	Abocho	170	17
			Ayingba	100	10
			Egume	145	15
			Ojodu	123	12
	Zone C	Adavi	Aku	120	12
			Ateba	95	5
			Osara	82	8
			Ababo	75	8
Total	3	3	12	1537	160

Sources: Agricultural development project in Kogi (2016)

Data were collected using well-structured questionnaires on awareness on post-harvest management of selected crops, farmers' perception on post-harvest management of the selected crops and challenges associated with post-harvest management. Objectives of the study were achieved using descriptive statistics such as frequency distribution, percentage and mean.

Perception of farmers on the benefits of post-harvest management was measured using 5-point Likert scale, and was allotted as follows: Strongly agree 5, Agree 4, undecided 3, disagreed 2, slightly disagree.

The overall perception score was then categorized into favourable and unfavourable.

RESULTS AND CONCLUSION

Socioeconomic characteristics

Results in Table 2 indicated that the mean age of the farmers in Kogi State was 43 years. This implies that farmers were still in their active and productive age. This may influence their readiness to try innovation, acquire new skills and knowledge on every aspect of post-harvest management for better income and livelihood. This finding concurs with Agada and Ijih (2019) assertion that larger proportion of maize farmers in Benue state are young. Results in Table 2 revealed that the mean household size of the farmers was 7 persons. This result implies large family size. Large family size might assist the households in the provision of unpaid family labour in postharvest management practices. Results in Table 2 indicated that the mean farming experience of the farmers was 29 years. Results in Table 2 indicated that the mean years spent in formal education was 9 years. This signifies low literacy level considering the technical know-how required for proper sorting, grading, packaging, pest and diseases control together with other post-harvest management practices. This agrees with

Pelemo *et al.* (2019), who reported that bulk of rural farming families in Kogi State, Nigeria had low literacy level. Result in Table 2 showed that the mean farm size of farmers was 3.3 hectares. This implies that farmers in the study area operate on a small scale small. Results in Table 2 indicated that the mean annual income of the farmers was N414,012, implying substantial income. It is expected that high income could assist farmers financially in seeking for new techniques, skills and knowledge that will enhance their income and livelihood. The findings agreed with that of Elemosho, Alfred, Aneke, Chugali and Ajiboye (2017), who stressed that most farmers in River State, Nigeria were moderate income earners. Table 2 revealed that all the respondents (100%) grown yam and maize in the study area. This implies that yam and maize are the most widely grown crops.

Table 1: Distribution of the farmers according to socio-economic characteristics (n=160)

Variables	Frequency	Percentage	Mean
Age			
≤30	34	21.2	43
31-40	33	20.6	
41-50	57	35.6	
51-60	28	17.5	
>60	8	5.1	
Household size			
1-5	71	44.4	7
6-10	64	40.0	
11-15	23	14.4	
16-20	2	1.2	
Experience in Farming			
1-10	17	10.6	28.9
11-20	29	18.1	
21-30	40	25.0	
31-40	41	25.6	
>40	33	20.7	
Years spent in formal education			
1-6	45	30.8	9
6-12	63	43.2	
>12	38	26.1	
Farm size			
≤1.0	20	12.5	3.3
1.01-2.0	41	25.6	
2.01-3.0	42	26.2	
3.01-4.0	29	18.1	
4.01-5.0	8	5.0	
>5.0	20	12.5	
Annual farm income			
≤ 50000	13	8.1	414012
51000-100000	26	16.2	
101000-150000	24	15.0	
151000-200000	25	15.6	
201000-250000	14	8.8	
>250,0000	58	36.2	
Types of crops grown			
Yam	160	100.0	
Maize	160	100.0	

Sources: Field survey, (2018)

Awareness on post-harvest management in yam

Results in Table 3 indicated all (100.0%) of the farmers in were aware of all the methods of post-harvest management in yam. This finding implies high degree of level awareness of post-harvest management of yam which could also implies high level of utilization. This result implied that majority of the yam farmers were aware of post-harvest management of yam in the study area.

Table 3: Distribution of the farmers according to awareness on post-harvest management in yam (n=160)

Post-harvest management awareness	Frequency	Percentage
Packing materials		
Traditional basket	160	100.0
Use of head pan	160	100.0
Use of sack bag	160	100.0
Storage methods		
Use of barn	160	100.0
Under a shade	160	100.0
Use of pit dug on ground	160	100.0
Use of ventilated store shed	160	100.0
Use of grass silo	160	100.0
Use of bare floor	160	100.0
Transportation		
Use of motorcycle	160	100.0
Use of truck/lorries	160	100.0
Use of bicycle	160	100.0
Preservation methods (ash and chalk)	160	100.0
Processing		
Pounding	160	100.0
Yam floor	160	100.0
Roasted	160	100.0
Slicing/chips	160	100.0
Pest controls		
Use of insecticide egtermidor	160	100.0
Use of chemicals that kill rats/indocile	160	100.0
Diseases controls		
Regular cleaning of warehouse	160	100.0
Use of disinfectant	160	100.0

Sources: Field survey, 2018

Awareness on post-harvest management in maize

Results in Table 4 revealed that majority of the farmers were aware of all the post-harvest management except use of maize cribs as storage materials where 76.9% farmers were aware. This implies that majority of the farmers were aware of post-harvest management in maize. High level awareness might be attributed to the fact that maize is one of the major cereals produced by farmers for income generation and improved livelihood in both States. This agreed with Elemosho *et al.* (2017), who reported high awareness of post-harvest management among farmers in River State, Nigeria.

Table 4: Distribution of the farmers according to awareness on post-harvest management in maize(n=160)

Post-harvest management awareness	Frequency	Percentage
Sorting method		
Hand picking	160	100.0
Use of tray/pan	160	100.0
Grading method		
Sieving	160	100.0
Selective picking	160	100.0
Winnowing	160	100.0
Packing materials		
Use of traditional basket	160	100.0
Use of jute bag	160	100.0
Use head pan	160	100.0
Storage materials		
Use of maize cribs	123	76.9
Use concrete tank/silo	160	100.0
Use of jute sack	160	100.0
Use of sealed silo	160	100.0
Use of earthen pot	160	100.0

Post-harvest management awareness	Frequency	Percentage
Transportation methods		
Use of pick-up lorry	160	100.0
Use of motorcycle	160	100.0
Use of bicycle	160	100.0
Preservation methods		
Sun drying	160	100.0
Open air drying	160	100.0
Hanging on trees	160	100.0
Open fire	160	100.0
Processing methods		
Processed to maize flour	160	100.0
Processed to pap	160	100.0
Processed to corn meal	160	100.0
Processed to corn starch	160	100.0
Pest control		
Uses of trap	160	100.0
Use of indocile	160	100.0
Storing without winnowing	160	100.0
Dusting with ash and charcoal	160	100.0
Diseases control		
Regular cleaning	160	100.0
Sorting of infected from healthy ones	160	100.0

Sources: Field survey, 2018

Perception on the benefits of post-harvest management

Results in Table 5 revealed that majority (67.5%) of the respondents agreed that post-harvest management increase farmers' standard of living. This implies that adoption of post-harvest management practices has a tendency of increasing farmers' standard of living. The improved standard of living is mostly recorded when farmers stored produce to be sold during the period of scarcity. This finding agreed with Anyawu *et al.* (2017), who revealed that the most noticeable effect of adoption of a given technology is increased income and standard of living for the adopters. Also, 60.6% and 60.6% of the farmers agreed that post-harvest management is good for meeting farmers' needs in time of food scarcity and meet farmers daily food needs. Moreover, 57.5% of the respondents agreed that post-harvest management meet farmers' nutrition requirements. This implies that post-harvest management has the ability of supplying food and essential minerals and vitamins to rural farming populace in the study area. This finding concurs with Elemosho *et al.* (2017), who reported that farming populace in River State, Nigeria benefited from increase in food production through adoption of post-harvest management. Also, 55.6% of the respondents agreed that post-harvest management improves farmers produce shelf life, signifying that post-harvest management practice would add more value to farmers produce for improved market value.

Table 5: Distribution of the farmers according to perception on the benefits of post-harvest management (n=160)

Perception Statements	SA	A	UN	DA	SD
Post-harvest management is good for meeting farmers need in time of food scarcity	23.8	60.6	8.1	2.5	5.0
Post-harvest management are not too difficult to finance	26.9	53.1	8.1	5.6	6.2
Post-harvest management meet farmers daily food needs	15.0	60.6	13.1	2.5	8.8
Post-harvest management meet farmers nutrition requirement	57.5	27.5	8.1	8.1	5.0
Post-harvest management increase farmers standard of living	14.4	67.5	9.4	2.5	6.2
Post-harvest management improve farmers produce shelf life	19.4	55.6	12.5	3.8	8.8
Post-harvest management are compatible with farmer indigenous food preservation	19.4	51.2	13.8	5.0	10.6
Post-harvest management improved farmers income	14.4	53.1	17.5	5.0	10.0
Post-harvest management are cost effective	13.8	55.6	14.4	5.0	11.2
Post-harvest management complement existing practices	8.1	45.0	15.0	13.1	18.8

Sources: Field survey, 2018

Note: SA= Strongly agreed, A=Agreed, UN=Undecided, DA=Disagreed, SD=Strongly disagreed

Categorisation of perception of farmers on the benefits of post-harvest management

Table 6 shows the level of perception on the benefits of post-harvest management by farmers in the study area. The results reveal that the majority (87.5%) had favourable attitude on the benefits of post-harvest management practices. This implies that majority of the farmers perceived post-harvest management practices as good in the study area. However, high perception is expected to enhance farmers' income and standard of living.

Table 6: Categorisation of perception on the benefits of post-harvest management by farmers

Variables	Frequency	Percentage	Minimum	Maximum	Mean	SD
Favourable	140	87.5	10	50	37.2687	8.76867
Unfavourable	20	12.5				

Sources: Field survey, 2018

Challenges associated with post-harvest management

Table 7 showed that shortage of funds (98.1%), high cost of post-harvest materials (94.4%), transportation challenges (93.8%), inadequate infrastructures (92.5%) and inadequate credit facilities (88.8%) were the most challenge to post-harvest management encountered in the study area. Shortage of fund or lack of access to capital is a major problem facing Nigeria farmers. This finding agrees with that of Mohammed *et al.* (2018) who indicated that shortage of fund was the smallholder farmers in Sub-Sahara Africa. The cost of post-harvest materials has skyrocketed due to high inflation in Nigeria Lack of flexible road network is one of the challenges affecting smallholder farmers in Nigeria. The major roads to most farms are not motorable and mostly result to breakdown of vehicles and truck use in conveying farmers produce to the market and farm gate. This finding concurs with that of Elemasho *et al.* (2017) who reported that transpiration challenges contribute to post-harvest farm losses in River State. Also, inadequate access to storage and preservatives equipment is a serious challenge to post-harvest management practices in the study area. This finding agreed with Agada and Ijih, (2020) who stated that poor infrastructure is a constraint faced by Maize in Benue State. The least ranked challenges in the study area were loss market value (56.3%) and disease attack (53.8%).

Table 7: Distribution according to challenges to with post-harvest management practices (n=160)

Variables	Frequency	Percentage
Inadequate credit facilities	142	88.8
Shortage of funds	157	98.1
Inadequate trainings on post-harvest	131	81.9
High cost of post-harvest materials	151	94.4
Loss in market value	90	56.3
Insect attacks	109	68.1
Inadequate market information	119	74.4
Disease attack	86	53.8
Transportation challenge	150	93.8
Inadequate technical knowledge	123	76.8
Inadequate infrastructure	148	92.5

Sources: Field survey, 2018

CONCLUSION AND RECOMMENDATIONS

It can be concluded that majority of respondents were in their active age with many years in farming. All the farmers were aware of post-harvest management in yam and maize production. Respondents agreed that post-harvest management increase farmers' standard of living, meet farmers' nutrition requirements, that it is also good for meeting farmers need in time of food scarcity. The major challenges to post-harvest management were shortage of funds and high cost of post-harvest materials. It is recommended that farmers should pull their resources together in order purchase cost friendly infrastructures for their produce. Farmers should leverage on the traditional management practices to save cost. Also, research institutes such as Nigerian Stored Products Research Institute (NSPRI) should come up post-harvest materials that are affordable and adaptable to farmer.

REFERENCES

Ahungwa, G. T. and Ahungwa, J. I. (2020). Farm level assessment of Post-harvest Losses Estimation and Management of Yam in Benue Stat, Nigeria, *Journal of Agripreneurship and Sustainable Development,* 3 (3), 118-127.

Agada, M. O. and Ijih, B. E. (2019). Analysis of Post-harvest Management among Maize Farmers in Oju, Benue State, Nigeria. *Journal of Agriculture and Environmental Sciences*, 8 (1), 191-198.

Elemasho, M. K., Alfred, S. D. Y., Aneke, C. C., Chugali, A.J. C. and Ajiboye, O. (2017). Farmers' perception of adoption of post-harvest management of selected food crops in Rivers State, Nigeria, *International Journal Agricultural Respiration, Innovation and Technology*. 7 (1), 22-26.

Kogi State Ministry of Information (2016). *Working Document.* Pp. 1-56.

Mohammed, A. R. S., Alhassan, S., and Jatoe, J. B. D. (2018). An overview of constraints to soybean production in the Northern Region of Ghana, *Journal of Development*, 15 (2), 20-29.

Musa, G. (2020). Managing Post-harvest Losses for Improved Food security in Nigeria: A Conceptual Review, *International Journal of Management and Social Science*, 2 (1), 116-123.

National population commission (NPC), (2006). Year book on Nigeria population data. Report of the NPC. Retrieved from http://www.jstor.org. Retrieved on 02/02/17.

Pelemo, J. J., Mohammed, U., Omaku, M. and Opara, S. (2019). Analysis of Poverty Status of Cashew Farmers in Kogi State, Nigeria. *Journal of Agriculture, Food and Development,* 19 (2), 16-25.

UC Sustainable Agriculture Research and Education Program (2018). "Sustainable Postharvest Management Practices". What is Sustainable Agriculture? UC Division of Agriculture and Natural Resources. Retrieved from https://sarep.ucdavis.edu/sustainable-ag/postharvest 26-06-2023.