

ON-SEASON POSTHARVEST INFORMATION NEEDS AMONG PLANTAIN MARKETERS IN ONDO STATE, NIGERIA

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ABSTRACT

The study ascertained marketers' postharvest information needs in plantain in Ondo State, Nigeria, specifically describing the socio-economic attributes of the marketers, examining quantity purchased and lost in on and off seasons, identifying areas where information is needed, and identifying constraints to information needs among the marketers. A multi-stage sampling procedure comprising purposive and simple random sampling was used to select 242 plantain marketers. A structured and duly validated questionnaire was used to elicit quantitative data, while a Focus Group Discussion (FGD) guide was used to collect qualitative data. Data collected were analyzed using descriptive statistics such as frequency count, percentages, and mean ($\bar{x}$) while a t -test was used to test the hypothesis stated for the study. Some of the results showed that the quantity of plantain purchased was approximately (retailers = 496Kg, wholesalers = 4559Kg). On average, marketers lost approximately (retailers = 282kg, wholesalers = 423kg) of plantain across the different stages of postharvest activities. Consequently, data showed high information needs in selected areas like the use of foam padding along the bottom and appropriate side walls of the truck during transportation for retailers and wholesalers respectively ($\bar{x}$) = 2.98 and ($\bar{x}$) = 3.14), standardized grading and sorting ($\bar{x}$) = 3.68 and ($\bar{x}$) = 3.63), de-handing the bunches and transport in a reusable stackable cage ($\bar{x}$) = 3.92 and $\bar{x}$ = 3.80). On the constraints, retailers and wholesalers respectively indicated poor knowledge of plantain postharvest handling practices ($\bar{x}$ = 4.18 and $\bar{x}$ = 3.18) as most serious. Based on the result of the inferential statistics, there was no statistically significant difference between wholesalers' and retailers' information needs. It was concluded that plantain marketers experience huge losses in plantain marketing, resulting in high information needs in several areas of postharvest activities. The study recommends the training of plantain marketers on proper postharvest practices to reduce losses.

Keywords: Postharvest, Information needs, plantain marketers

INTRODUCTION

Many African populations rely heavily on plantains (*Musa paradisiaca*) in their diets as they provide over 25% of their daily caloric intake (Kainga, Okorji, and Nweze, 2014). With an annual production of about 86 million tonnes, it is ranked as the sixth most significant basic food crop worldwide. Africa remains the leading producer of plantains, accounting for approximately 29 million tons of the global output. Following Africa, the Americas and Asia

are significant producers, with yields of around 7.5 million tons and 5.6 million tons, respectively (FAOSTAT, 2022).

Nigeria ranks as the second-largest producer of plantains in West Africa, with an annual yield of approximately 2.4 million metric tons, primarily from its southern states (Ajayi, 2018). Although the demand for plantains is year-round, high-quality plantain bunches are mostly available in Nigeria from October to February each year

(Adewumi et al., 2009). There is little information in the literature about the losses experienced by plantain marketers in Nigeria, and Ondo State in particular, mainly during the on-season.

Despite its prominence, Nigeria does not feature among plantain exporting nations because it produces more for local consumption than for export (FAOSTAT, 2018). However, the major problem of plantain marketing has been identified as postharvest losses (Adewunmi, Ayinde, Falana, and Olatunji, 2009). Nigerian fruits and vegetables have not been able to meet world standards because of poor postharvest handling. Therefore, it is important not only to grow more but also to save what is grown at high cost because the cost of preventing losses after harvest is generally less than planting a similar amount of fruit and vegetable crops of the same quality. Nonetheless, Achugbue and Anie (2011) affirmed that among the information needs of marketers, postharvest information is the most sought after as marketing is one profession that depends on the constant flow of information.

Addressing information needs is necessary to increase plantain marketers' knowledge of postharvest information encompassing cleaning, sorting and trimming, grading, packaging, transportation, storage, and marketing. This is due to the fact that agricultural produce has been found to suffer significant damage during storage and marketing when postharvest handling information is lacking (Abass, Ndunguru, Mamiro, Alenkhe, Mlingi, and Bekunda, 2014). According to Ekoja (2010), information needs are the things that information seekers need to know in order to go about their daily lives and conduct business. For example, plantain marketers in rural areas, in particular, need to know what their counterparts in more developed countries are doing in order to improve their postharvest practices.

Although studies related to information needs have been conducted in Nigeria and across the globe, this study focused more on the on-season postharvest information needs of plantain marketers in Ondo State. In Lagos State, Nigeria, Njoku (2004) investigated the information needs and information-seeking behavior of fishermen. Similarly, Ozioko (2010) investigated the needs of rural women in Enugu State for information on reproductive health. Both studies focused on farmers and did so in different geopolitical regions of Nigeria, employing various farming methods. Achugbue and Anie (2011) affirmed that among the information needs of marketers, postharvest information is the most sought after. Increased agricultural production without improved postharvest handling will fail to yield commensurate improvements in the fight against food insecurity. It is in view of these facts that it is essentially important to study on-season postharvest information needs among plantain marketers in Ondo State, Nigeria. Specifically, the study described the socio-economic characteristics of plantain marketers in the study area; estimated the volume of plantain marketed and losses incurred, assessed the postharvest information needs, and identified constraints militating against access to plantain postharvest information by respondents in the study area

Hypothesis of the study: There is no significant difference between the information needs of plantain wholesalers and retailers in the study area.

Methodology

The study was conducted in Ondo State, Nigeria. The State is known for plantain production, hence, marketers of plantain are found across the Local Government in the State. It was created on February 3rd 1976, from the former Western state. The state contains eighteen local government areas, the major ones being Akoko, Akure, Okitipupa, Ondo, Ilaje,

Idanre and Owo. The state Capital is Akure, with a population of 3.5million people. The State is the largest producer of cocoa in Nigeria.

The population for this study comprised of plantain marketers categorized as wholesalers or retailers based on the quantity purchased in Ondo State across the eighteen Local Government Areas. The plantain wholesalers are traders who buys plantain in large quantities directly from the farm gate, transport plantain to a collection centre or selling point and sell plantain on wholesale in dozens and tens of dozen bunches of plantain to retailers. Usually, they buy and sell plantain in heaps of three categories of small, medium and large. Retailers are those traders who buys from the wholesalers. Most of the retailers sell in bunches or clusters of plantain fingers and sell as retailers to restaurant operators, food vendors, hoteliers, individual etc.

Sampling Procedure and Data Collection method

Owing to the nature of the plantain marketers, respondents were selected across the four agricultural zones with emphasis on areas with major plantain markets in the State. Therefore, a multi stage sampling procedure was used for data collection in the study area.

The first stage involved purposive selection of major plantain markets within the four agricultural zones in Ondo State where plantain marketing is intensively done. Based on the preliminary findings in Owo, Ikare, Ondo and Okitipupa zones. Two major markets each were selected in each of the zones. For Owo zone, Shasha and Ogbese markets were purposively selected, Oba and Akungba markets in Ikare zone, Owena and Idanre in Ondo zone while Irele and Okitipupa markets were selected in Okitipupa zone based on the intensity of plantain marketing.

Owing to lack of population for the plantain marketers in Nigeria, sample size formula for unknown population proposed by Charan (2013) as modeled below was used:

$$n = \frac{p(1-p)Z^2}{d^2}$$

Where:

n = sample size

P = Proportion of population used, here 20% = 0.2) was used

Z = represents confidence; the value is from the z-score table (confidence at 95%= 1.96)

d = acceptable error margin which is at 5% = 0.05

With the above figures, a sample size of approximately 245 was obtained. However, 242 plantain marketers were the valid data. This represents a response rate of 98.2%.

At the second stage, a simple random sampling technique was used to select 242 plantain marketers from the States. After sorting, 121 retailers and 121 wholesalers were recorded. Six Focused Group Discussions were carried out in four randomly selected markets. Focus groups were formed based on plantain marketers who were wholesalers and retailers. Validated structured interview schedule was used for data collection. Data collected were analysed with the use of t-test and described with frequency and percentages.

Results and Discussion

Socio-economic Characteristics of Plantain Marketers

The percentage of married retailers and wholesalers was 78.5% and 66.1%, respectively. This result show that there are more married persons in the marketing of plantain. This results also supports the findings of Chiemela et. al. (2021), who reported that married people engage more in plantain marketing as a livelihood mean in most areas where plantain cultivation is predominantly done. On age classification, the overall mean age of retailers and wholesalers respectively were 46 and 51 years. The study revealed that almost all the plantain marketers fell within the active age of 15-64 years defined by FAO (1992) as economically productive population. Evidence

in Table 1 clearly shows that primary school education was also the highest level of education attained by 58.7% of wholesalers and half (50.4%) of retailers. However, only 4.1% of the retailers and none of the wholesalers had tertiary education. Retailers and wholesalers are relatively educated and well-informed, and as a result, they will be able to quickly adopt new developments in postharvest handlings in plantain marketing, which will result in more effective performance in ensuring food security. This is true since basic literacy level is required to understand how to utilize postharvest information (Eze and Nwibo, 2014). This result is also supported by the results of Illo *et al.*, (2016) and Kaka *et al.*, (2021), who reported a similar trend of education among onion producers and marketers in Kebbi State.

The mean marketing experience is 11 and 14 years for both retailers and wholesalers respectively. This means that the enterprise is sustainable since respondents stay for long period of years in the business and the higher their marketing experience, the more efficient they become in the marketing of plantain in the study areas. To further buttress this point, Sadiq *et al.* (2015) emphasized that years of experience improve risk management in businesses. Furthermore, the result presented in Table 1 reveals that 72.7% and 65.3% of the retailers and wholesalers respectively agreed that the long period of waiting for a means of transportation after purchase of plantain is critical and a major stage of postharvest losses in plantain marketing. This result corroborates with Kader (2005), who posited that the more a perishable produce stays in the market, exceeding its time of purchase, its deterioration time also increases. This result however, contradicts the findings of Harry and Akachi 2021, who reported that seasonal demand is a major factor resulting to fruits losses amongst fruit marketers. Excerpt from one of the FDG sessions held at Irele market in Ondo State reported this:

..... most drivers complain a lot

about the bad road which is obviously bad and because of that sometimes we spend up to three days waiting for vehicles to transport our plantain, the plantains are exposed to rain and sun if not properly covered and eventually changes in colour will start taking place. The most painful part is when we experience road accidents or vehicle problem during transportation which can keep us for days before getting another vehicle and it becomes a big problem to get loaders and offloader for a new vehicle if the problem is not rectified...Except from the FGD at Irele Market in Ondo State

Plantains are extremely difficult to keep for an extended period at room temperature due to their extremely high moisture content. The result further shows that only small percentage (13.2% and 11.6%) of retailers and wholesalers respectively have received formal training on postharvest losses. The implication of these findings is that plantain marketers in the study area are not exposed to regular training which is an integral part of human development. This however, corresponds with the assertion of Manzoor *et al.* (2020), that majority of the marketers are in urgent need of postharvest trainings in order to preserve their produce. Similarly, Yang *et.al.*, 2021 reported that trainings on how to mitigate postharvest losses are highly desirable among farmers in China. The above analysis is best supported by the excerpt from one of the FDG sessions conducted at Oba Market in Ondo State transcribed as follows:

.....since I joined this plantain business, I have only been trained thrice, we rarely see people to provide us with necessary information apart from friends and fellow marketers. I really wish we can be taught because there are so many questions we want to ask but no avenue to relate them them.

Infact, sometimes this plantain business can be very frustrating when you cannot find immediate and authentic approach to handling practicesExcerpt from one of the FGD session at Oba Market, Ondo State, Nigeria on 11th, December, 2021.

Table 1: Distribution of plantain marketers by their socio-economic characteristics

Variable	Retailers (n=121)		Wholesalers (n=121)	
	Frequency	Percentage	Frequency	Percentage
Marital Status				
Married	95	78.5	80	66.1
Age (year)				
30.00 - 39.00	14	11.6	3	2.5
40.00 - 49.00	59	48.8	44	36.4
50.00+	48	39.7	74	61.2
Mean	47.12		51.89	
Marketing experience (year)				
<10.00	32	26.4	28	23.1
10.00 - 19.00	84	69.4	58	47.9
20.00+	5	4.1	35	38.9
Mean	11.84		14.25	
Stages of plantain PHL				
During the Period of waiting for a means of transportation	88	72.7	79	65.3
During loading and offloading	11	9.1	22	18.18
During transportation	22	18.2	20	16.52
Formal Training on Postharvest handling				
Yes	16	13.2	14	11.6
No	105	86.8	107	88.4

Source: Field survey, 2021.

Quantity of Plantain purchased during the on-season marketing period

The quantity of plantain purchased during the on marketing season of plantain by the marketers were estimated in kilogram with the help of weighing scale at different stages of the marketing process. This was done for both wholesalers and retailers. In Table 2, it was observed that on average, retailers purchased approximately 496 Kilogram worth of plantain and wholesalers purchased approximately 4559 kilogram. This may be as a result of the difference in the level of patronage and access to plantain. The high volume of plantain marketed by both respondent in the study per market show that the business of plantain may be viable.

Report of FGD indicated that more plantains are sold during the peak season while scarcity of plantain is experienced during the off season as reported thus:

... we operate based on seasons. During the peak season of plantain, we have access to more and prices are ridiculously low when insecurity was not a problem. These days, we are no longer free to enter the farms as free as we used to because of the herdsmen problems. Before now,

during the peak season, we can buy as high as 500 bunches as long as you have your money and can go far into the villages to meet with the farmers but things have changed. Insecurity, bad roads and high cost of transportation have made things very difficult and the above identified problems do not seem to have immediately solutions. This means that cost of plantain will continue to go up because limited quantity will be accessed if the present trends continue... Excerpt from one of the FGD session conducted at Irele market in Okitipupa LGA, Ondo State, Nigeria on 8th January, 2022.

Excerpt from another Expert Survey stated that marketers in Ondo State buy plantain from Edo State as stated below:

...most times, we go as far as Edo State like Ohosu, Igboigi, and Owan areas to buy plantain as prices are more favorable there than in Ondo State especially during the plantain season. Although, this also affect the price our plantain and the quantity purchased...Excerpt from the expert survey

Table 2: Estimates of the quantity of plantain purchased.

On season volume (kg) purchased	Wholesalers		Retailers	
	Mean	Std.	Mean	Std.
Total number of plantain (bunches) purchased/ market	4559	109.69	496	8.93

Source: Field Survey, 2021.

Quantity of losses incurred during the on-season marketing period

Based on the results in Table 3, it was observed that on average, wholesalers lost approximately 423kilogram worth of plantain during loading, unloading, transportation, ripening stage and losses resulting from pest and diseases infestation. However, losses incurred during transportation of plantain is the largest of all the different stages of postharvest activities. This may be due to impact, compression, vibration, bruising and breakage damages. Meanwhile, the average total loss at retailing level (wholesale purchase to consumer sale) was estimated to be

282kg. This report conforms with the result of Adepoju et.al who posited that postharvest losses of fruits and vegetables in Nigeria are aggravated by poor marketing, distribution and storage facilities. Reduction in food volume promotes insecurity and the direct impact of this losses is on the livelihoods of farmers and other supply chain actors like marketers who depend solely on income from their produce for survival. The indirect impacts are on consumers because high losses contribute to escalating food prices.

Table 3: Estimates of the quantity of losses in plantain during the on season.

On season volume of loss (kg)	Wholesalers	
Wholesalers	Mean	Std.
Total loss during loading (bunches)	56.4	0.31
Total loss during transportation (bunches)	169.2	4.38
Losses during ripening	84.6	3.06
Losses during unloading	84.6	2.18
Loss from diseases and pest	28.2	9.69
Total	423	10.4
Retailers		
Losses from purchase to sale (bunches)	282	8.95
Total	282	8.95

Source: Field Survey, 2021.

Postharvest Information Needs of Plantain Marketers

The information needs of respondents as shown in Table 4 indicates a significant need from retailers and wholesalers respectively, regarding the use of reusable plastic cage for packaging and transportation of plantain hands ($x = 3.92$ and $x = 3.80$), grading ($x = 3.68$ and $x = 3.63$), use of foam padding along the bottom and appropriate side walls of the truck during transportation ($x = 3.31$ and $x = 2.56$) among others in Table 4. The implication of this findings may be unconnected to the fact that information is a very critical component in marketing and necessary for minimizing undesirable qualitative and quantitative losses. Based on the result in Table 4, information on grading is required because there is currently no standard measurement for plantain marketing in Nigeria. Instead, prices are determined by the number of fingers in each bunch and, in some cases, by how heavy a bunch feels when carried rather than measured or weighed on a scale. Consequently, there is need to make standard unit of measurement in the marketing of plantain.

The information needs on transportation is in accordance with the assertion of Oluwole, 2016 who asserted that plantain marketing in Nigeria presently is being heavily affected by transportation in terms of manner as well as means. This stage is the most delicate and risky of distribution because the harvested plantain can be lost totally by either mechanical failure or accident of the vehicle during transportation, immobilizing goods for several days. The following qualitative findings were used to support the aforementioned statement:

... we do not have alternate means of transportation. Hence, we pass through terrible roads and many drivers will need to be persuaded before they assist us. The roads are very bad and we have to take advantage of any means of transportation by piling up plantain and load them in such a way that we can get them out of the farms. We believe once we get them out, buyers will buy and they will know how to keep them from spoilage, we will appreciate vital information regarding vehicle availability and accessible road for transportation. We do not mind making our own

financial contributions toward that since those in authority alone cannot help**Excerpt from FGD in Idanre in Ondo.**

As a result of the careless throwing and overloading of plantains on one another at this stage, evidence on the information needs for loading and unloading is also crucial in the marketing of plantains. This stage is the most delicate and risky of distribution because the harvested plantain can be lost totally by either mechanical failure or accident of the vehicle during transportation, immobilizing goods for several days.

.....for many of us our major concern is to convey maximum of the product while occupying all the available space. we tell the loaders to overloads the vehicle in order to make one trip only. Although, these careless operations bring about twisting of peducules, breaking and dropping of many finger and eventually leads to losses so we need this information so as to know what to do to reduce this kind of loss. **Excerpt from FGD in Sasha market in Ondo State, Jan 8th, 2021.**

Table 5: Postharvest Information Needs of Plantain Marketers

Variable	Retailers		Wholesalers	
Plantain postharvest information needs	Mean	Std. Dev	Mean	Std.
grading (size, colour, quality)	3.68*	0.93	3.63*	0.99
use of reusable plastic cages for packaging and transportation of plantain hands	3.92*	0.48	3.80*	0.75
use of foam padding along the bottom and appropriate side walls of the truck during transportation	2.98*	1.10	3.14*	1.20
careful throwing of plantain during loading and unloading	3.31*	0.95	2.56*	0.25
Atmospheric condition of stocking plantain bunches under shades shielded from sun	3.38*	0.21	3.26*	1.01
government policies and scheme on plantain marketing	3.06*	1.01	2.93*	1.16
Cooling system/the use of refrigerator to slow down ripening	2.17	1.47	1.38	0.22
utilize market surplus by processing into value added products	1.64	0.96	1.60	1.02
diseases and pest control	2.93*	1.44	3.03*	0.55
prospective buyers and better market	1.12	0.93	1.93	1.00
Crop insurance	1.78	1.10	1.64	0.88
Local market prices	3.25*	0.98	2.76*	1.16
Distant market prices	2.73*	0.76	3.55*	1.24
Postharvest handling training	2.87*	1.11	2.90*	0.99

Source: Field survey, 22 20 .

Constraints to Postharvest Information

The major factor affecting information sourcing among plantain marketers were noted to be lack of knowledge about relevant information on postharvest handling ($x = 4.18$ and 3.18) among retailers and wholesalers respectively while other identified serious constraints were inadequate contact to agricultural extension agents ($x = 3.83$ and 3.62) for retailers and wholesalers respectively. This was followed by inability to access formal channel of information ($x = 3.07$ and 3.78) as serious constraint. These constraints can be attributed to the few number of extension workers in the study area, lack of electricity or power interruption, agricultural information being broadcast at odd hours when marketers who need the information are not dispose. This result tallies with the findings of Abiodun-Solanke, (2010) who opined that inadequate knowledge of handling and processing of plantain into form which can last a long period has also led to wastages.

Table 6: Constraints to postharvest handling information

Variable	Retailers		Wholesalers	
	Mean	Std. Dev	Mean	Std. Dev
Postharvest Information constraints				
Lack of knowledge of relevant postharvest handling information	4.18*	1.07	3.18*	0.86
Poor language of information presentation	2.84	1.18	2.87	1.00
Inability to comprehend the information content	2.53	0.87	2.57	0.84
Poor medium of information communication	2.36	0.90	2.69	0.89
Location/ environment lived by marketers	2.38	0.72	2.80	0.78
Lack of plantain association	2.53	0.61	2.48	1.08
No time/chance to consult information sources	3.08	0.92	2.66	0.86
Lack of income	2.31	0.97	2.30	0.83
Inability to read and write	2.84	1.19	2.73	1.11
Inadequate contact to extension agents	3.83*	0.63	3.62*	0.54
Lack of feedback	2.91	0.61	2.67	1.25
Inability to access formal channel of information	3.07*	1.10	3.78*	0.86
Absence of nearby information centre	3.05*	1.27	3.62*	1.33

Source: Field survey, 2022.

**postharvest information constraint (mean > 3.00)*

Difference in the information needs of plantain wholesalers and retailers

Results in Table 7 show that there is no significant difference in the information needs of plantain wholesalers and retailers with a t-test value of -3.321 , df (480) at 0.002 level of significance. The mean information needs of wholesalers and retailers were obtained as 68.112 and 51.132 respectively. This shows that wholesalers information needs is appreciably

higher compared to their counterparts in the business. The higher information needs may invariably promote reduction in losses if the respondents make attempt to search for such information. Searching for a piece of information has been observed to be trigger by the needs. Thus, respondents' eagerness to seek for information is determined by their needs (Humbhi *et al.*, 2022).

Table 4.12: Differences in information needs

Category	Mean	Std. Dev	Df	T	Sig. (2-tailed)
Retailers	51.132	9.75	480	-3.321	0.002
Wholesalers	68.112	10.16			

Source: Computed from the field survey, 2021

*Significant at 0.01 level

Conclusion and recommendations

Postharvest losses in every stage of plantain marketing especially during the on-season can be minimized if information needs on postharvest handling are met in the country. In this study, both qualitative and quantitative losses in plantain marketing were recorded high and information to ameliorate the postharvest losses were highly needed. However, there is no significant difference between the information needs of wholesalers and retailers. It was recommended that stakeholders in the field of agriculture in Nigeria should intensify efforts in

training marketers on the appropriate postharvest practices to adopt with a view to viewing plantain marketing as a lucrative venture. Innovative system of postharvest handling should be introduced by the agricultural extension agents to marketers. This will encourage marketers to adopt approaches and innovations that may enable them to increase their return on investment and by extension, ensuring food securities in Nigeria.

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