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Post-Harvest Challenges of Marketers of Selected Neglected Crops in South-East and South-South, Nigeria

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Abstract
Research works on neglected crops have been based on production improvement with little or no attention on other key value chains such as marketing. This study examined the challenges of marketers of selected neglected food crops (Bambara nut: *Vigna subterranean;* Breadfruit: *Artocarpus altilis* and Bush-mango: *Irvingia gabonensis*) in Southern Nigeria. A multistage random sampling technique was used to select 144 respondents from 6 major markets and structured questionnaire administered, while descriptive analysis was used to analyze the data. The results revealed the mean age of the marketers as 40 years, 86.8% females and 83.3% literate. The mean number of house-holds was seven (7) persons and marketing experience of 10.1 years. The average quantities of purchase for each crop were 5131.1250kg (Bambara nut), 77.4288kg (Breadfruit) and 246.7600kg (Bush-mango). The average lengths of storage of these crops before selling were 102, 30 and 77days for Bambara nuts, Breadfruits and Bush-mango respectively. Causes of losses were attributed to the following; 27.7% insect and pest, 42.4% mold, and 29.9% rodents. About 2.8% of the neglected crop marketers used sniper for the preservation of their crops, while 27.8% out of the other 97.2% used bio-insecticide. Constraints militating against the sale of these neglected food crops in the study area were; lack of organized market, lack of financial support, high cost of transportation, strenuous market purchase, and susceptibility to pests, and lack of storage facility. The study therefore, recommends that marketers be encouraged to form or belong to trade associations or cooperative societies to enhance access to loan, and research into Post-harvest technology related to the selected food crops (such as storage structures and processing equipment) should be developed and disseminated appropriately.

Keywords: Challenges, Marketers, Neglected Crops, Bambara nuts, Breadfruits, Bush-mango

Introduction

Food insecurity has been a great challenge in Nigeria, the quantity of food available are not enough to feed the ever increasing population due to numerous reasons such as reduction in the cultivation and underutilization of indigenous food crops (Popoola *et al.*, 2019). Most indigenous crops that are capable of improving food security have been neglected and underutilized and the few concentrated and over utilized food crops could not meet the demand of the populace. According to Bolarin and Bosa (2015) in their study of post-harvest losses: a dilemma in ensuring food security in Nigeria, food security was defined as when all people at all times have physical and economical access to sufficient, safe and nutritive food to meet their dietary needs and food preferences for an active and healthy life. To achieve food security in Nigeria, potentials of neglected food crops should be fully exploited at all levels of value chain and this corroborates Idowu, (2009) who stated that the potentials for agriculture and rural development can be unlocked, if importance of the neglected, and underutilized crops can be realized. Agricultural value chain involves production, harvesting, handling, processing, transportation, storage, marketing and consumption of agricultural produce (SANREM, 2022). Each of the value chain is significant to food security because food can be lost at any stages of value chain.

Discovery of oil has limited the commitment to agriculture in South-South region of Nigeria; most resources to be used for agriculture such as labor are diverted into oil industries and many known important crops from the region are now neglected and underutilized (Matemilola and Elegbede, 2017) Neglected crops have not been given much research attention but the little research done on neglected food crops were mostly based on production improvement with little or no attention on other key value chains such

as marketing. Marketing is an important aspect of agricultural value chain and it can be defined as the performance of business activities that ensures distribution of food through buying and selling. Some of the problems faced by marketers include; perishable nature of the agricultural produce, lack of good roads, poor quality of products, price volatility, inadequate market information system, many dealers and lack of marketing policies for rural products (Arbabi *et al.*, 2015). The general objective of the study is therefore to examine the challenges of marketers of neglected food crops, in Southern Nigeria.

Methodology

The study was carried out in South-East and South-South Nigeria (Akwa- Ibom, 4.9057°N, and 7.8537°E), (Ebonyi, 6.2649°N, 8.0137°E) and (Rivers States, 4.8396°N, 6.9112°E) in May 2021. The population for the study involved marketers of the selected neglected crops (Bambara nut, Breadfruit and Bush-mango). A multistage purposive sampling procedure was used for the study. The first stage involved purposive selection of three states, two states from the South-South (Akwa-Ibom and Rivers) and one state from the South East (Ebonyi). The second stage involved liaising with Agricultural Development Programme (ADP) extension agents in each state for the selection of 2 Local Government Areas (LGAs) where the marketing of the selected crops exist to make 6 LGAs. A major market where all the selected neglected crops are sold was selected in each LGA, to also make 6 markets selected in all the three states (Urua-Abak, Urua-Itam, Eke-Imoha, Nwakpi, Mile 3 Market and Mile 1 market) and random sampling was used to pick 8 marketers in each of the selected neglected crops to make 24 respondents from each market selected and a total of 48 respondents from a state and 144 respondents from all the three states selected. Data were collected from the respondents through the use of structured questionnaire

Results and Discussion

Table 1 show that 33.3% of the respondents were between 30-39 years, 34.7% between 40-49years and mean age of 40.0 years, implying that 68.0% of the marketers were less than 50years. Majority (86.8%) of the marketers of neglected important crops in the study area was also females, of which 88.9% were married and 2.8% widowed. Only 16.7% of the population had no formal education and 39.6% attempted secondary school with mean of 3 years of formal education. The marketers are well experienced with average of 10.1 years of marketing experience and a mean of 7 persons per house-hold. Majority (93.1%) of the marketers did not belong to any marketing association and only 6.9% do. This implies that the marketers of the neglected but important crops in the study area are still very active and in their productive ages. The implication of the findings is that the farmers are still young, educated and experienced.The result supports the findings of Muojekwu *et al.* (2017) who reported that most of the marketers were young, fairly educated and well experienced women.

Table 2 showed that 66.3% of the marketers bought their crops for sales directly from the farmers and 33.7% from the market, the implication of this is that buying directly from the farm can reduce the cost of purchase and increase the quantity to be purchased since middle men are not included in the transaction and marketers are buying directly from the farmers. This supports the law of demand that states that, other things being equal, quantity demanded increases as price falls (John, 2003). Table 3 showed the mean quantity of each selected neglected crop purchased by marketers in the study area per trip, were, Bambara nut 5131.1250kg, Breadfruit 77.4288kg and Bush-mango 246.7600kg. Meaning that, the marketers are not buying in very large quantities. This could be due to poor storage facility, pest infestation and lack of finance, since most of the marketers depend solely on their personal savings to do the marketing of the neglected food crops without access to loans. This supports the findings of Muojekwu *et al*. (2017) who confirmed that marketers of Breadfruits in his study area depend on their little personal savings to fund their business.

Table 4 shows the mean length of storage of each crop by the marketers before spoilage in the study area as follows; Bambara nut has the highest storage mean of 102 days before selling, Breadfruit has the lowest mean of 7 days and Bush-mango 77 days. Storage is a necessity because it increases the market price of the agricultural produce during the off season. This implies that, the marketers do not have good storage structures that can preserve the crops for longer months. In addition, the neglected crops are also similar to other agricultural produce which are perishable in nature and do not store well under normal room condition, except with the use of adequate storage structures. This corroborates with Oyedele *et al.* (2020) who found out that inadequate storage structure is a constraint to marketers in his study area. Piet *et al.* (2011) also stated that the maximum storage duration of agricultural products varies and can be only a few days for some fruits and vegetables, a couple of months for tubers and bulbs, and over a year for dried food grains and other seeds.

Table 5 showed that 62.5% of the marketers experienced losses, while 37.5% of the respondents did not. This implies that majority of the marketers sold quickly perishable agricultural produce (Breadfruit and Bush mango). This agrees with FAO (2021), who reported that, fruits, vegetables and root crops are much less hardy and are mostly quickly perishable, and if care is not taken in their harvesting, handling and transport, they will soon decay and become unfit for human consumption. Table 6 explained causes of losses to marketers of neglected crops in the study area, 27.7% of the marketers attributed the causes of their losses to insect and pest, 42.4% mentioned mold and about 29.9% rodents. The high percentage of losses caused by mold could be to the environmental nature of southern part of the country that is characterized with heavy rain fall and high humidity which encourages the mold growth on

selected agricultural crops. This supports Oyewole *et al.* (2014) who stated that June- July is a period of thick clouds and excessively wet in the Niger Delta and coastal low lands and these areas are marked by humidity with average values hardly below 82%. Okunade (2006) also added that Vitamin content is also affected by humidity during storage and by mold infection which lead to quality loss of food.

Table 7 showed that 54.2% of the marketers confirmed the supply of the neglected crops in fresh state, while 45.8% received supply in dried state. This state of supply is determined by the distance to the market, level of moisture content in crops and also the length of storage. In addition it could also be responsible for losses recorded on neglected crops in the study area. Agricultural produce with minimum level of moisture content will store better than those with high level of moisture content. This support the findings of Agnieszka and Krzysztof (2013) who stated that to keep losses low, crops must be dried to the safe storage moisture content within the safe storage time. Table 8 revealed that 90.3% of the marketers in the study area add no value on neglected food crops before sales and only 9.7% added value. Lack of value addition on crops increases the rate of post-harvest losses of food crops and endangers the food security of a nation, reduces the farmers and marketers' income and increases the rate of malnutrition. Peters (2018) confirmed that post-harvest losses accounts for over 30% of global food losses and that innovative strategies need to be developed and adapted in our production, processing, value addition, storage and preservation processes in order to minimize incidences of post-harvest damages thereby enhancing food security.

Table 9 above showed that 97.2% of the neglected crops marketers did not use agrochemicals for the preservation of their crops, while 2.8% (Bambara nuts Marketers) confirmed they do, the result implies that the marketers using agrochemicals need adequate orientation to avoid misuse of the chemical, contamination of food and exposure to hazards. Ojo, (2016) reported that several responsible bodies and organization are taking the initiative to ensure safe use of pesticides in Nigeria. Table 11 showed that, 2.8% (Bambara nuts marketers) of the neglected crop marketers used sniper as the only agrochemical used by the respondents in the study area and directly on the Bambara nuts for the preservation of their crops, while majority (97.2%) did not. This means that few marketers of the neglected food crops in the study area could be selling contaminated food crops to people which are dangerous to the public health. This corroborates with NAFDAC (2018) who stated that application of sniper and other related agrochemicals directly on food crops by unauthorized persons is a dangerous practice. Obinna (2020) also reported that Director General of NAFDAC warned against continuous misuse and misapplication of insecticides and other brands of Dichlorvos by the general public, especially grain merchants, beans aggregators and dried fish sellers that it could lead to health implications and even death.

Table 12 showed that majority (72.2%) of the respondents did not use natural methods for preservation of neglected crops in the study area, while 27.8% do. This implies that the awareness level on the use of natural method for preserving food crops is low in the area. This supports the research findings of Atoma and Akeni (2017) that lack of information can prevent innovation to adoption. Table 12 also indicated that 19.4% of the marketers of neglected crops used warm wood ash, 8.3% made use of pepper, while 72.2% did not use any natural methods for preservation of their crops. This implies that they are affordable and ecofriendly natural methods that can improve food preservation without using costly and dangerous synthetic agrochemicals. This follows Opera News (2021) that stated that wood ash can be used in place of an insecticide in preserving the grains and store them as long as ones wish.

Table 13 above revealed that lack of organized market, lack of financial support, ignorance of the crop nutritional values, high cost of transportation, strenuous market purchase, susceptibility to pest, lack of storage facility and inadequate knowledge on processing have their mean greater than the grand mean of 2.6 and they are all considered as constraints against the marketing of neglected crops in the South-South region of Nigeria. The implication of this result is that the potentiality of all the neglected crops for food security could remain unlocked if solutions are not provided to the constraints. Oluwole (2019) also found out that lack of market information, lack of storage facilities and lack of funds are the constraints to marketers in Nigeria.

Conclusion

The study has shown that marketers of selected neglected food crops in the study area could not buy the selected food crops in large quantities for sale due to lack of finance, susceptibility to pest and lack of storage facilities. They could not store the selected crops for long because of inadequate storage structure; the marketers also experienced post-harvest losses before sales caused by insect/pest, heat, mold, injury and rodents. Majority of the marketers lack natural preservative methods on neglected food crops and the constraints against their sales include; high cost of transportation, lack of financial support, and lack of organized markets and strenuous purchase of the selected neglected food crops in the study area. The study therefore, calls for the need for marketers to form or belong to trade association or cooperative society to have access to loan. Research into Post-harvest technology related to the selected food crops (such as storage structures and processing equipment) should be developed and disseminated appropriately. Awareness on natural methods of preserving food crops against the use of agro chemicals should be improved to safe life, and good roads should be maintained to reduce transportation costs.

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Table 1: Distribution of Marketers of neglected food crops according to Socio-Economic Characteristics (N=144)

Socio-Economic Characteristics	Frequency	Percentage	Mean	Mean
Age				
20-29	24	16.7		
30-39	48	33.3		
40-49	50	34.7	40	
50-59	16	11.1		
60-69	4	2.8		
70-79	2	1.4		
Sex				
Female	125	86.8		
Male	19	13.2		
Years of formal Education				
6 years	56	38.9	3.0	
12 years	57	39.6		
14 years	7	4.9		
No formal education	24	16.7		
House-Hold Size				
1-5	42	29.2		
6-10	94	65.3	7.0	
11-15	8	5.6		
Marital Status				
Single	8	5.6		
Married	128	88.9		
Widowed	4	2.8		
Divorced	4	2.6		
Years of Business Experience				
1-5	18	12.5		
6-10	54	37.5	**10.1**	
11-15	46	31.9		
16-20	16	11.1		
21-25	10	6.9		
Trade Association				
Yes	10	6.9		
No	134	93.1		

Source: Field Survey, 2021

Table 2: Distribution of Marketers according to Source of neglected food crops for marketing (N=144)

Source of commodity	Frequency (F)	Percentage (%)
Farm	124	66.3
Market	63	33.7

Source: Field Survey, 2021

Table 3: Distribution of Marketers according to average quantity of purchase per neglected food crop (N=144)

Crop	Average quantity purchased
Bambara nut	5131.1250kg
Breadfruit	77.4288kg
Bush-Mango	246.7600kg

Source: Field Survey, 2021

Table4: Distribution of Marketers according to length of storage for each neglected food crops before selling (N=144)

Crops	Mean of length of storage (days)
Bambara nut	102
Breadfruit	7
Bush-Mango	77

Source: Field Survey, 2021

Table 5: Distribution of Marketers according to losses experienced on neglected food crops (N=144)

Loss experienced	Frequency (F)	Percentage (%)
Yes	90	62.5
No	54	37.5
Total	**144**	**100**

Source: Field Survey, 2021

Table6: Distribution of Marketers according to causes of the losses on neglected food crops before sales (N=144)

Cause of losses	Frequency (F)	Percentage (%)
Insect/pest	49	27.7
Mold	75	42.4
Rodents	53	29.9

Source: Field Survey, 2021

Table 7: Distribution of Marketers according to the state of neglected food crop purchased for sales (N=144)

State of crop supplied	Frequency (F)	Percentage (%)
Fresh	78	54.2
Dried	66	45.8
Total	**144**	**100**

Source: Field Survey, 2021

Table 8: Distribution of Marketers according to the value addition on neglected food crops before selling (N=144)

Value addition before selling	Frequency (F)	Percentage (%)
Yes	14	9.7
No	130	90.3
Total	**144**	**100**

Source: Field Survey, 2021

Table 9: Distribution of Marketers according to the use of agrochemicals for preservations of neglected food crops (N=144)

Use of Agrochemicals for preservation of neglected crops	Frequency (F)	Percentage (%)
Yes	4	2.8
No	140	97.2
Total	**144**	**100**

Source: Field Survey, 2021

Table 10: Distribution of Marketers according to the name of agrochemicals used for preservations of neglected food crops (N=144)

Names of agrochemicals used for crop preservation	Frequency (F)	Percentage (%)
Sniper	4	2.8
None	140	97.2
Total	**144**	**100**

Source: Field Survey, 2021

Table 11: Distribution of Marketers according to the use of natural methods for preservation of neglected food crops (N=144)

Use of traditional methods for preservation	Frequency (F)	Percentage (%)
Yes	40	27.8
No	104	72.2
Total	**144**	**100**

Source: Field Survey, 2021

Table 12: Distribution of Marketers according to the types of natural methods used for neglected food crops preservations (N=144)

Types of traditional methods used for preservation of crops	Frequency (F)	Percentage (%)
The use of warm wood ash	28	19.4
Addition of pepper	12	8.3
None	104	72.2
Total	**144**	**100**

Source: Field Survey, 2021

Table 13: Distribution of Marketers according to the constraints against sales of neglected crops (N=144)

Constraints against sales of neglected crops	Mean	Decision Order	Rank
Lack of national promotion policy	1.45	Reject	9th
Economically non profitable marketing	1.34	Reject	10th
Lack of organized market	3.01	Accept	8th
Lack of financial support	3.90	Accept	3rd
Cultural belief	1.15	Reject	12th
Ignorance of crop nutritional value	3.73	Accept	7th
High cost of transportation	3.93	Accept	2nd
Strenuous market Purchase	3.75	Accept	6th
Strenuous sales	1.12	Reject	13th
Inadequate demand	1.05	Reject	14th
Susceptibility to pest	3.79	Accept	5th
Lack of storage facility	3.97	Accept	1st
Inadequate knowledge on processing	3.87	Accept	4th
Insufficient labor	1.25	Reject	11th

Source: Field Survey, 2021 Grand Mean: 2.6