FARMERS' PERCEPTION OF ADOPTION OF POST-HARVEST TECHNOLOGIES OF SELECTED FOOD CROPS IN RIVERS STATE, NIGERIA

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Abstract

The study was conducted to determine the perception of food crops farmers on adoption of selected post-harvest technologies in Rivers State, Nigeria. A multistage snow-ball, procedure was used to sample 135 selected food crops farmers in the State. A well, structured questionnaire was used to obtain information from the respondents using both descriptive and inferential statistical tools. The result revealed that, majority (85.9%) of the respondents, were females while 84.4% of the respondents were married. The mean age of the respondent was 41.0 years and highly experienced in food crops production with mean of 15.9 years experience. Majority of the respondents (77%) attended primary school. The level of food crops farmers' perception on adoption of post-harvest technologies packages was positive, majority (78.1%) of the respondents agreed with the positive statements on adoption of post-harvest technologies, implying the possibility of high level of adoption of post-harvest technologies. The perception of the food crops farmers also had influence on adoption level of the selected post-harvest technologies packages with ($P < 0.05$). The study concluded that food crops farmers had positive perception of post-harvest technologies in the study area and the study therefore, recommends that Extension should make the technologies available along with training.

Keywords: Perception, Adoption, Post-Harvest, Technologies, Food crops

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Introduction

Agricultural practice provides the basic needs of life in terms of food, shelter and clothing, which results in better living standard in Nigeria. This vital sector is mainly characterized with the use of simple tools and primitive ideas, which result in low productivity and low income. According to Seidu *et al.* (2012) for agriculture to remain the back bone of Nigerian economy, it needs to be given the needed attention, which can be achieved by implementing modern technologies in the processing, storage and marketing of food crops.

Ogunremi and Oladele (2012) also supported that, for Agriculture to be profitable new technologies must be adopted, and that, the perception of the farmers on adoption of innovation plays a vital role. Are the farmers seeing adoption of post-harvest technologies as a necessity or optional? This is because farmers' attitudes towards an innovation could determine the level of adoption of that particular technology. This agrees with Jabil and Abdu (2012) who reported that the level of adoptability of innovation by farmers depends on the attitudes of the farmers towards the agents and his information.

However, Research institutes such as Nigerian Stored Products Research Institute (NSPRI), a well organized research institute, have designed and disseminated technological innovations to farmers on post-harvest losses reduction through exhibition, community development programme and agricultural shows (Williams, 2013). Farmers remain conservative and unwilling to adopt post-harvest technologies despite all the efforts. It is on this basis that this study assessed the perception of food crops farmers on post-harvest technologies of some selected food crops in Rivers State, Nigeria.

The specific objectives are to; ascertain the socio-economic characteristics of the selected food crops farmers in Rivers State; determine the food crops farmers perception on the adoption of selected post-harvest technologies; identify the post-harvest technologies that have been adopted from the packages; and determine the level of adoption of selected post-harvest technologies by the selected food crops farmers in the study area.

Materials and Methods

The study was carried out in Rivers State, Nigeria. The state has 23 Local Government Areas (RSMOA, 2014). It lies between latitude 4.7500°N and longitude 6.8333°E, with a total land mass of about 1,940,000 ha. Large (39%) fertile flat plain at the upland areas and water bodies covers about 60% of the rest surface areas.

The following food crops farmers (Plantain, Vegetables and Maize farmers) constituted the population for the study. A multistage snow-ball sampling technique was used to sample 135 respondents. The first stage involved, purposive selection of three local government areas Etche, Abual/Odual and Oyigbo (L.G.As) that fell on upland areas, where there is cultivable land for Agriculture.

The second stage was selection of three villages within each LGA where crops production is fully practiced, while from each village, 75 selected food crops farmers` names lists were collected through snow ball technique making a total of 675 lists collected from all the villages selected. Lastly, random sampling was used to select 15 respondents from each village in the three local government areas, making total of 135 respondents for the study.

Data were collected from the respondents using structured questionnaire. It contained relevant questions based on the objectives of the study. The dependent variable for the study was the adoption of post-harvest technologies, which was measured by adoption scores.

The independent variables were, age measured at interval level, sex measured at nominal, years of formal education measured at ordinal, household sizes measured at interval and years of farming experience was also measured at interval while perception of post-harvest technologies were asked in degrees and measured at ordinal level by using five- point Likert type scale such as strongly agreed (5), agreed (4), undecided (3), disagreed (2) and strongly disagreed (1) for positive statements and the scores were reversed for negative statements. Technologies adopted from the packages was asked in dichotomy and measured at nominal level such as adopted (1) and not adopted (2). Descriptive statistics such as frequency, percentage and mean were used to categorize respondents based on their socio-economic characteristics. It was also used for technologies adopted from the packages.

Inferential statistics were used to establish a relationship between farmers` perception and adoption level of post-harvest technologies. Perception level was determined with the use of grand mean, the perception statement with the mean above the grand mean was categorized as positive perception and those with the mean below the grand mean was termed negative perception.

Results and Discussion

Socio economic characteristics of the respondents

Table 1 revealed that 60.6% of the respondents were young, and were within the active age group of 25-45 years. The mean age of the respondents was 41.0 years. The implication of the mean age on adoption of post-harvest technologies is that the young farmers can take risk by adopting new technologies than the older farmers.

This supports Jabil and Abdu (2012) that young farmers are willing to adopt new genes than the older ones and they are not aversive to risk.

Most of the respondents (85.9) were females, meaning that women dominated food crop production in the study area. Olayemi *et al.* (2012) also reported that women are more involved in agricultural activities than men in the study area. More so, 84.4% of the respondents were married. The implication of this is on social responsibility, the married people would be more responsive to innovation adoption to increase their productivity to be able to cater for the family. This corroborates Dauda *et al.* (2014) who indicated that married people would be responsive to innovation since they would have family responsibility. The majority (77%) of the respondents attempted primary schools while 23% of the respondents had no formal education. This implies that the majority of the respondents were literates and this could encourage effective use of post-harvest technologies. In addition, the mean of the years of farming experience was 15.09 years, meaning that the respondents had been farming for long, they are highly experienced in the crop production and this could make farmers to make comparisons for what they have been having from their old practice. Such judgment could enhance their turning around.

This correlates with Jabil and Abdu (2012) who stated in their findings that adoption of innovation by farmers is affected by many factors such as farmers' conservative attitude towards innovation. Furthermore, it was found that the mean for the house hold sizes was six persons per family. This may imply that labor for the post-harvest activities were readily supplied by the family member.

Table 1. Distribution of respondents according to socio-economic characteristics (N=135).

Socio-Economic Characteristics	Frequency	Percentage	Mean
Age (Years)			
< 25	1	0.7	
25-35	47	34.8	
36-45	46	34.1	41.0
46-55	31	23.0	
>55	10	7.4	
Sex			
Female	116	85.9	
Male	19	14.1	
Years of formal Education			
6years	42	31.2	
9years	8	5.9	3.09
12years	40	29.6	
15years	8	5.9	
17years	6	4.4	
Non formal	31	23	
House-Hold Size			
1-4	45	33.3	
5-9	74	54.8	
10-14	13	9.6	6
15-19	3	2.3	
Marital Status			
Single	13	9.6	
Married	114	84.4	
Widowed	7	5.3	
Divorced	1	0.7	
Years of Farming Experience			
1-10	45	34.2	
11-20	63	46.6	15.9
21-30	20	14.8	
31-40	6	4.4	

Source: Field Survey, 2015

Perception of the post-harvest technologies adoption by the food crops farmers

Table 2 showed the perception of the respondents to both positive and negative statements about adoption of post-harvest technologies. All the positive statements have the mean ranging from 4.3 to 4.7 indicating decision to adopt post-harvest technologies since they all agreed with the positive statements on post-harvest technologies adoption and rejected negative statement that discourage adoption of post-harvest technologies.

The mean for each of the negative statement was 1.4 indicating strongly disagreed with negative opinions on adoption of post-harvest technologies. The grand mean is 3.8 indicating agreed. Meaning, the respondents are willing to adopt post-harvest technologies in the packages because of their positives perception

Level of farmers' perception on adoption of post-harvest technologies

Table 3 revealed that 78.1% of the respondents had positive perception for adoption of selected post-harvest technologies of food crops while 21.9% of the respondents had negative perception for adoption of selected post-harvest technologies of food crops. This implies that the future hope of adopting the selected post-harvest technologies is very high in the study area.

Post-harvest technologies adopted from the packages by the farmers

Table 4 shows that 100% of the respondents claimed that all the post-harvest technologies in the packages were not adopted, meaning that extension service was poor and not successful in the study area. This corroborates with Ochuk (2013) who reported that adoption of innovation remained the major yard stick for determining the success of Agricultural extension services on the intended beneficiaries.

Level of adoption of selected post-harvest technologies

Table 5 revealed that 100% of the respondents poorly adopted the selected post–harvest technologies in the study area. Therefore, most of the food crops (plantain, vegetable and maize) produced could be lost at post harvest stages in the study area because of non-adoption of post-harvest technologies and this could lead to lower out-put of food crops and reduction in income and poor standard of living of the food crops farmers. This agrees with Olayemi *et al.* (2012) and Owolade (2011) who reported that, most of agricultural produce are lost during post-harvest handling and that up to 50-70% losses are estimated between production area and consumption point because of inadequate post-harvest handling and non adoption of post-harvest technologies. Olayemi *et al.* (2012) also explained further that post-harvest losses will lead to reduction in farmers` income, food

insecurity, poor nutritional value and lack of input for the next production

Relationship between farmers' perception and their level of adoption of post-harvest technologies

Table 6 showed that there is a significant relationship between farmers' perception and adoption of post-harvest technologies in the study area, as the p value is less than 0.05. This shows that positive perception could lead to high level of adoption of post-harvest technologies.

Table 2. Distribution of the respondents according to their perception of post-harvest technologies.

Perception Statements	SA	A	UD	D	SD	Mean Score	Decision
i. Adoption of post-harvest technologies is essential	84(62.2)	46(34.0)	2(1.5)	2(1.5)	1(0.7)	4.6	Accept
ii Post-harvest technologies adoption is necessary	84(62.2)	46(34.0)	2(1.5)	2(1.5)	1(0,7)	4.6	Accept
iii. Modern post-harvest technologies adoption are better than using local tools	78(57.8)	47(34.8)	8(5.9)	1(0.7)	1(0.7)	4.5	Accept
iv Post-harvest technology adoption reduces post-harvest activities stresses in crop productions	86(63.7)	46(34.1)	1(0.7)	1(0.7)	1(0.7)	4.6	Accept
v. Post-harvest technologies should be adopted regardless of costs	58(42.9)	63(46.7)	11(8.1)	2(1.5)	1(0.7)	4.3	Accept
vi Adoption of post-harvest technologies cannot reduce post-harvest losses of crops	1(0.7)	1(0.7)	3(2.2)	43(31.9)	87(64.4)	1.4	Reject
vii Co-farmers should be discouraged from adopting post-harvest technologies	1(0.7)	1(0.7)	4(3.0)	42(31.1)	82(60.7)	1.4	Reject
viii Post-harvest technologies adoption can raise farmers to maximum standard of living	82 (60.7)	50(37.0)	1(0.7)	1(0.7)	1(0.7)	4.6	Accept
ix Post-harvest technologies should be adopted on a permanent basis	110(81.5)	20(14.8)	2(1.5)	2(1.5)	1(0.7)	4.7	Accept

Adoption (N= 135)
Source: Field Survey, 2015 Grand Mean: 3.8
Legends for positive statements: SA= Strongly Agreed 5, A= Agreed 4, UD= Undecided 3, D= Disagreed 2, SD= Strongly Disagreed 1.
Legends for negative statements: SA= Strongly Agreed 1, A= Agreed 2, UD= Undecided 3, D= Disagreed 4, SD= Strongly Disagreed 5

Table 3. Distribution of the respondents according to the level of perception on adoption of post-harvest technologies.

Perception Level	Frequency	Percentage (%)
Positive ( )	945	78.1
Negative ( )	265	21.9
Total	1210	100

Source: Field Survey, 2015

Table 4. Distribution of the respondents according to the technologies adopted.

Post-harvest technologies	A F (%)	NA F (%)
Plastic crates: Plantain	0 (0)	135 (100)
Plantain slicers: Plantain	0 (0)	135 (100)
Multipurpose dryer: Plantains, Vegetable and maize	0 (0)	135 (100)
Transparent polythene nylon: Plantain and Vegetable	0 (0)	136 (100)
Sealing machine: Plantain and Vegetable	0 (0)	135 (100)
NSPRI vegetable basket: Vegetable	0 (0)	135 (100)
Vegetable shed: Vegetable	0 (0)	135 (100)
Metal cribs: Maize	0 (0)	135 (100)
Inert atmosphere silo: Maize	0 (0)	135 (100)
Improved ware-house: Maize	0 (0)	135 (100)
Total	0 (0)	135 (100)

Source: Field Survey, 2015

Table 5. Distribution of the respondents according to the level of adoption of post-harvest technologies (N=135).

Level of adoption	Frequency	Percentage (%)
Poor Adoption	135	100.0
Fair Adoption	-	-
Good Adoption	-	-
Total	135	100

Source: Field Survey, 2015

Table 6. Relationship between farmer's perception and their level of adoption of post-harvest technologies.

Relationship	r^2	Df	P-value	Decision
Perceptions Scores vs Level of Adoption of Post-harvest Technologies	131.030	1	0.000	S

*Significant at 0.05, S = Significant, NS = Not Significant
Decision: P-value is significant when less than 0.05

Conclusion

The study concludes that the perception level of food crops farmers on post-harvest technologies was positive and the future hope of adopting the selected post-harvest technologies in the study area is very high.

Recommendation

Research institutes, ADPs and NGOs should work in collaborations to develop awareness programs and Extension should make the technologies available along with training.

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