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Determinants of Adoption of Post-Harvest Losses Prevention Techniques among Banana/Plantain Marketers in Lagos State, Nigeria

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ABSTRACT

This study examined the factors responsible for the adoption of post-harvest losses prevention techniques among plantain/banana marketers in Lagos State. Multi-stage sampling procedure was used to select 69 marketers of plantain/banana in the study area and a structured questionnaire was administered on them. Data collected were analysed using descriptive statistics and multiple regression analysis. The study revealed that the majority of the marketers were female (97.0%); the plantain/banana marketers affirmed that they suffered postharvest losses (100%). Few of the respondents (5.8%) adopted pre-cooling as a method of postharvest loss prevention technique, chemical treatment (16%), modified atmosphere packaging (17.4%), artificial ripening (5.8%), packaging (14.5%), handling and transportation (14.5%) and 26% indicated that they had no specific technique to prevent postharvest losses Factors influencing the adoption of modern techniques of preventing postharvest losses in plantain/banana by marketers were age ($p<0.00$), education ($p<0.01$,) extension agent contact ($p<0.01$) and income ($p<0.01$). It is thus recommended that government at all levels should legislate a law that will ban improper transportation of agricultural produce, most especially plantain/banana and encouragement of investment in Postharvest loss prevention technologies.

Keywords: Postharvest, Plantain/banana, Adoption, marketers, Techniques.

INTRODUCTION

Postharvest losses of food are considered a global challenge to the attainment of the sustainable development goals of zero hunger and responsible consumption and production patterns in recent times (Apurba, 2019). In Sub-Saharan Africa, postharvest loss is mainly important owing not only to low yields but also because about 374 million people are feared to experience severe food insecurity (FAO, IFAD, UNICEF, WFP and WHO, 2018).

Banana/Plantain (*Musa spp*) is one of the well-known delicious fruits and preferred by people of all ages. It is highly nutritive and also a rich source of energy (89 kcal/100g) (Sidhu and Zafar, 2018). It is one of the cheapest and most nourishing fruits. The origin of banana is considered the southern part of China. Nigeria is ranked 4th among banana-producing counties in the world (FAOSTAT, 2015; ProMusa, 2017).

Banana/Plantain is a highly perishable fruit and its postharvest losses range from 25 to 50% during transporting and marketing due to adverse physiological changes, softening of the flesh, and lack of resistance capacity against microbial attack (Akter *et al*., 2015).

Post-harvest losses (PHLs) represent a significant challenge in agricultural value chains, particularly in developing countries like Nigeria, where losses exacerbate food insecurity and reduce farmers' incomes (FAO, 2019). Plantain and banana, being perishable crops, are especially susceptible to PHL, with losses often occurring due to inadequate handling, storage, and transportation infrastructure (FAO, 2019).

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Adopting post-harvest loss prevention techniques can mitigate these challenges, ensuring the availability of fresh produce and maximizing economic benefits for stakeholders in the value chain Busari *et. al*., (2015). Techniques such as pre-cooling, chemical treatment, and modified atmosphere packaging have been identified as effective solutions but are underutilized due to socio-economic and infrastructural constraints (Abdulahi *et al*., 2023).

This study seeks to identify the socio-economic factors influencing the adoption of these techniques among plantain and banana marketers in Lagos State, Nigeria, with a view to offering policy recommendations for improving post-harvest management.

METHODOLOGY

A two-stage sampling technique was used to select 69 plantain/banana marketers in Lagos State. First, three major markets known for plantain/banana trade were purposively selected (Sabo market, Ikorodu; Mile-12 market and Ketu Market). Second, a simple random sampling technique was employed to select respondents from the chosen markets. A structured questionnaire was used for data collection, and descriptive statistics (percentages and frequencies) alongside multiple regression analysis were employed for data analysis.

RESULTS AND DISCUSSION

Socio-Economic characteristics of Respondents

Table 1 showed the socio-economic characteristics of banana/plantain marketers in the study area. The results showed that the majority of respondents were women (97.0%), indicating that plantain/banana marketing is predominantly a female-dominated activity. This aligns with findings from Abdulahi *et al*., (2023), who noted women's pivotal role in marketing of agricultural produce in Nigeria.

The average age of the respondents in the study area was 36.4 years; this is an indication that the majority of the banana/plantain marketers are young in age and will be willing to adopt innovation, as indicated in Busari *et. al*. (2015).

The majority (88.4%) were married, with 8.7% separated/widowed, and 2.9% single. This suggest that married individuals dominate the sector, likely due to the necessity of supporting larger households or supplementing family income.

The moderate level of literacy (with 50.7% attaining at least secondary education) suggests that most marketers have basic education to understand the basics of post-harvest management.

The average household size of Banana/plantain marketers was 4.0. It suggests that smaller household sizes dominate the study area, potentially reflecting urban or semi-urban living pattern.

The mean income was ₦467,391.30. Nearly half (49.3%) of the marketers earn above ₦500,000, indicating that banana/plantain marketing can be a lucrative business.

Table 1: socio-economic characteristics of the respondents

Variable	Frequency	Percentage %	Mean
Sex			
Female	67	97.0	
Male	2	3.0	
Age (years)			

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Below 30	15	21.7	36.4
31-40	22	31.9	
Above 40	32	46.4	
Marital status			
Single	2	2.9	
Married	61	88.4	
Separated/widow	6	8.7	
Religion			
Islam	34	49.3	
Christianity	27	39.1	
Traditional/others	8	11.6	
Level of Education			
No formal Education	9	13.0	
Primary Education	25	36.2	
Secondary Education	24	34.8	
Tertiary Education	11	15.9	
Household size			
Below 3	31	44.9	4.0
3-5	22	31.9	
Above 5	16	23.2	
Income (N)			
Below 100,000	15	21.7	₦467,391.30
100,000-500,000	20	29.0	
Above 500, 000	34	49.3	
Extension agents contact			
Yes	2	3.0	
No	67	97.0	

Source: Field survey, 2023

Adoption of Post-harvest loss prevention techniques

Table 2 presents the results of the adoption pf post-harvest loss prevention techniques among the respondents in the study area. The results revealed that 5.8% of the respondents adopted pre-cooling as their prevention techniques, 16% adopted chemical treatment and 17.4% adopted artificial ripening while 5.8% and 14.5%

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adopted artificial ripening and packaging as prevention techniques against postharvest losses in the study area. However, 26% indicated that they adopted no specific post-harvest prevention technique. Respondents cited cost and lack of awareness as challenges to adoption of modern techniques like pre-cooling, chemical treatment and modified atmosphere packaging.

Table 2: Adoption of Post-harvest loss prevention techniques of the respondents

Post-harvest loss prevention	**frequency**	**Percentage (%)**
Pre-cooling	4	5-8
Chemical treatment	11	16
Modified atmosphere Packaging	12	17.4
Artificial ripening	4	5.8
Packaging	10	14.5
Handling and transport	10	14.5
No specific technique	18	26

Source: Field survey, 2023

Factors influencing adoption of Postharvest loss prevention techniques

Results of the determinants of adoption of post-harvest loss prevention techniques is presented in Table 3. The result revealed that age ($p<0.01$), education ($p<0.01$), extension agent contact ($p<0.01$) and income ($p<0.01$) were the significant socio-economic factors influencing the adoption of post-harvest loss prevention techniques in the study area.

Age was negatively associated with adoption, suggesting that younger marketers are more likely to adopt modern techniques. This finding is consistent with Busari *et. al*., (2015), who reported that younger farmers are generally more receptive to innovation. Education, income, and contact with extension agents positively influenced adoption, highlighting the importance of capacity-building and financial support to banana/Plantain marketers to acquire post-harvest loss prevention equipment and materials.

Table 3: Determinants of post-harvest loss prevention techniques

Variable	**Coefficient (β)**	**Standard Error**	**p-value**
Constant	1.245	0.312	0.000
Age	-0.042	0.010	0.000***
Education	0.285	0.078	0.001***
Extension Agent Contact	0.410	0.065	0.000***
Income	0.513	0.098	0.001***

Significance Levels: ***1%

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CONCLUSION AND RECOMMENDATIONS

The study highlights that plantain/banana marketers in Lagos State suffer exhibit low adoption of advanced prevention techniques of post-harvest loss. Key factors influencing adoption include age, education, extension contact, and income. To improve adoption, the following are recommended, education of banana/plantain marketers, through extension services to create awareness and knowledge of post-harvest technologies should be provided by the relevant agencies, such as Ministry of Agriculture. Financial Incentives to provide subsidies and credit facilities to encourage investment in modern loss prevention techniques through the banks and cooperative societies.

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