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DRIVERS OF FOOD LOSSES AND WASTES AMONG FARM HOUSEHOLDS IN SOME SELECTED LOCAL GOVERNMENT AREA OF OYO STATE, NIGERIA

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ABSTRACT

The study examined the drivers of food losses and wastes among farm households in some selected local government area of Oyo State, Nigeria. The study described the socioeconomic characteristics of the farm households, identified the causes of food losses and wastes among the farm households, determined the factors affecting farm households food losses and wastes and also identified the management strategies used by farm households to minimize food losses and wastes in the study area. Two stage sampling technique was used to select 86 farming households from two local government areas from who data were collected. The data were collected using questionnaire and analyzed with the aid of descriptive statistics and Ordinary Least Square regression model. Results obtained shows that farmers in the study area were mostly in their productive age with mean of 47 years, 80.2% were married with average household size of 5 persons and about 90.3% had formal education. The result also revealed that over/excessive purchase, unfavorable weather condition, pest and diseases attack and inadequate storage facility were the causes of food losses and wastes respectively. The OLS result showed that gender, household size, frequency of power supply, awareness on environmental effect of food losses and wastes and total income were the factors significantly affecting food losses and wastes among the farm households. However, the farm households employed storing food in a sealed container, appropriate meal planning and checking of food expiration date before purchase as strategies to minimized food losses and wastes in the study area. The study therefore recommended that Farm households should avoid over/excessive purchase of food stuff so as to reduce food losses, Also, Government should assist in providing stable power supply to safe food stored and prevent wastage.

Keywords: Drivers, Food, Losses, Households, Wastes.

INTRODUCTION

There is a consensus that food should be a basic human right, making this right a reality however remains one of the greatest challenges of the 21st century particularly in Nigeria where about 26.5 million people are projected to surfer high level of food insecurity (Food and Agriculture Organization (FAO), 2024; International Fund for Agricultural Development (IFAD), 2024). To achieve global food security, safe food must be available, accessible, supplied in a stable manner and used in nutritionally advantageous ways by all people . The availability of food is usually prioritized over access and utilization due to the focus on poverty as the underlying causes of food insecurity. Approximately 33% of the final food demand worldwide is thrown away as food loss and waste. The value of food loss and waste is estimated to be over $900 billion (FAO, 2020). This value is at the level where one-eighth of the world population can be saved from nutritional deficiencies. From this global perspective, the food loss and waste issue is closely associated with the global food security problem that might be incurred by inefficient allocation of food resources across countries. Additionally, from the standpoint of an environmental view, the generation of food waste increases the environmental burden as it causes not only the additional emission of greenhouse gases, but also an efficiency decrease in water and land use (FAO, 2020). Therefore, the food loss and waste issue has been an emerging international issue. Food waste and loss is known to have a negative impact on national food security, farm income, and consumer welfare (Gustavsson, *et al.,* 2020), it is a topic that should attracts the attention of policymakers in every developing country. Against this background that this study described the socio-economic and institutional characteristics of farm households, identified the causes of food losses and wastes among farm households, determine the factors affecting farm households food losses and wastes and management strategies used by farm households to minimize food losses and wastes.

METHODOLOGY

The Study Area

The study was conducted in Oyo State, Nigeria. Oyo is an inland State in South Western Nigeria. The State is bordered to the North by Kwara State to the East by Osun State, to the Southwest by Ogun State and the Republic of

Benin. With a projected population of 7,840,864 in 2020. The state economy remains largely agrarian, mostly producing Cassava, Cocoa, and Tobacco.

Sampling Techniques

Two stage sampling technique was employed for data collection. In the first stage, Ido and Oluyole Local Government Areas were randomly selected and in the Second stage, Akufo, Ido,
Omi-Adio, Elenusonso and Adebayo, Alomaja, Podo, Alata communities were randomly selected from the selected LGAs respectively. Out of which a total of 86 respondents were proportionately sampled for this study using Conchran (1974) formula.

$n = Z2 \times P \times q/e2$ (1)

Where:
n = sample size
Z = the standard normal deviation set at 1.96 corresponding to 95% confidence level
P = estimated proportion of an attribute that is present in the population
q = 1- P
e = the level of precision (with an error of 5%).

Method of Data Collection

Primary data were used for this study which was collected with the aid of structured questionnaires administered by trained enumerators.

Analytical Techniques

Descriptive statistics such as frequency distribution, percentages and mean were used to describe the socio-economic and institutional characteristics of the farm household. Ordinary Least Square regression was used to determine the factors affecting food losses and wastes among farm households. The explicit form of the model is specified in equation (1) as:

$Y= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + e$ (2)

Where,
Y = Total food losses and waste for the i^{th} farm household (N);
X_1 = Age of household head (years);
X_2 = Gender of household head (Male = 1, Female = 0);
X_3 = Household size (number of people in the household);
X_4 = level of education of household head (years spent in school);
X_5 = No. of children living in the household aged between 6 to 11 years (number of children);
X_6 = Presence of refrigerator in the household (Yes = 1, No = 0);
X_7 = Frequency of power supply (Always = 3, Occasionally = 2, Rarely = 1);
X_8 = Total income (N);
X_9 = Awareness on environmental effects of food waste and loss (aware =1, unaware = 0);
β_0 = Constant;
$\beta_1 – \beta_9$ = Parameters to be estimated;
e = error term.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Farm Households

The result in Table 1 shows that about 26.7% of the farmers were between the age brackets of 41-50 years. The mean age of the farmers was 47years which implies that, the farmers were still in their productive age. This result is in line with the result of Adebayo (2024) who reveals that 63.4% of the farming households were between the ages of 41-50 years. The results also revealed that 72.1% of the farmers were males while female farmers accounted for only 27.9%. This is perhaps due to the cultural and religious restriction that tends to confer females to mere household keepers rather than participating in strength-demanding farming activities. This result also agrees with the findings of Haddabi *et al.* (2019) who reported that (62.3%) of the farmers were male. Majority (80.2%) of the farmers were married. This implies that most of the farmers might be actively involved in farming to cater for the household needs, as a result farmers with family to cater for and the tendency for improving in farming activities to provide food for the family is relatively high. This result corroborate the findings of Agwu and Oteh (2014) who found out that married persons were more involved in farming activities due to higher food demand in the household. The result in Table 1 also revealed that farmers with household size of 1–5 persons in the study area accounted for 55.8% while the mean household size of the sampled farmers was five (5) persons. This imply that a larger household will result to high demand for food among the farming households. This finding is consistent with the result of Haddabi *et al.* (2019) who reported that (61.9%) of the respondents have the household sizes of 6-10 people. Analysis of the farmers level of education reveals that majority (90.8%) of the farmers had formal education with an average number of years spent in school to be 11 years while only very few 2.3% had non-formal education. Given that there is high level of literacy. It is expected that information on food production practices may be disseminated with ease among farmers and this could influence their decision-making process. This finding agrees with Aneke (2021) who reported that personal characteristics especially education, influences

adoption of new technology to increase food production among rural farmers.

Table 1: Socio-economic characteristics of the farm households

Variable	Frequency	Percentage	Mean
Age			
30 years and below	13	15.1	
31-40 years	15	17.4	
41-50 years	23	26.7	
Above 50 years	35	40.7	47
Gender			
Female	24	27.9	
Male	62	72.1	
Marital status			
Widow(er)	2	2.3	
Divorced	3	3.5	
Single	12	14.0	
Married	69	80.2	
Household size			
1-5 members	48	55.8	5
6-10 members	38	44.2	
Level of education			
Non- formal education	2	2.3	11
Primary education	14	16.3	
Secondary education	44	51.2	
Tertiary education	20	23.3	
Adult education	6	7.0	
Farm income			
200,000 and below	4	4.7	₦647,616.28
200,001-400,000	8	9.3	
400,001-600,000	22	25.6	
Above 600,000	52	60.4	

Source: Field Survey, 2024

The result in Table 1 shows that about 60.4% of the farmers realize an income of above ₦600,000 annually with an average mean income of ₦647,616.28. This implies that majority of farmers in the study area operate on a medium to small-scale farming system. This is as a result of high literacy level among the farming households that enable the farmers to expand the scale of food production to meet up with their family needs which agrees with the result of Agwu and Oteh (2014) who reveals that 72.1% of the farmers has an income range of N400,000 - N800, 000 as returns from their production activities**.**

Causes of food losses and wastes among farm households

The results presented in Table 2 shows that the causes of food losses and wastes among farm households was over/excessive purchase, which ranked first (96.5%) as a major cause of food losses among the farming households. This is a result of the farmers unable to maximally utilize the leftover of the excess food stuff and considering being in rural settlement, there is no adequate storage facility to preserved the excess food product resulting in to food losses. This agree with the findings of Obinaju and Ikpeida (2021) which showed that lack of adequate storage facility among the rural farmers tends to cause food wastage as the excess cannot be preserved. However, unfavorable weather condition was ranked second (82.55%) as cause of food losses, weather condition plays a great role in food loss due to seasonality and perishability of agricultural produce. Some agricultural produce needs adequate

sunshine for reducing the moisture content before storage, if otherwise there will be high rate of food losses to the farmers. More so pest, diseases and insect attack can also cause food losses, insect and pest attack crop plant in the field and reduce their viability to produce more yield and can also attack store produce and destroy it such as weevils, (C*alosobrocus maculatus*) which attack store cowpea and destroy it thereby causes food losses to the farmers. This is in line with the result of Abiad and Meho (2018) which reveals that insect pest attack crop and destroy store produce of the farmers and increasing the poverty status of the farmers. Inadequate storage facility, unfavourable weather condition and inadequate of electricity supply were also factors that cause food wastage among the farming households.

Table .2: Causes of food losses and wastes among farm households

Causes of food loss	Frequency*	Percentage	Ranking
Over/excessive purchase	83	96.51	1
Unfavourable weather condition	71	82.55	2
Pest, diseases and insect attack	69	80.23	3
Improper storage	58	67.44	4
Product expiration date	38	44.18	5
Crop moisture content	33	38.37	6
Causes of food waste			
Inadequate storage facilities	78	90.69	1
Unfavourable weather condition	72	83.72	2
Inadequate power (electricity) supply	68	79.07	3
Poor planning of cooking	56	65.11	4
Improper handling of food	43	50	5
Not consuming leftover food	43	50	5
Household members preference	39	45.35	6
Exposure to contamination	35	40.69	7
Excessive serving of food to individuals	23	26.74	8
Trying new methods of cooking	19	22.09	9
Improper preparation of food	16	18.60	10

Source: Field survey, 2024. * Multiple responses.

Inadequate electricity supply could be detrimental to food storage in most storage techniques which required electricity; there will be high food wastage without electricity supply. This substantiate with Obinaju and Ikpeida, (2021) which show that electricity was the major constraints face by farmers in food storage.

Factors affecting farm households food losses and wastes

The result of the Ordinary Least Square regression on the factors affecting farm households food losses and wastes presented in Table 3 revealed that the R^2 value was 0.9243, implying that about 92% of variations that in food losses and wastes were explained by the independent variables included in the models. While the remaining 8% were due to other extraneous variables not included in the model and error in measurement of some variables. The F-value of 103.11 was significant at 1%. This implies the model is of good fit.

The result in Table 3 also shows that there is a positive significant relationship between the gender of the farmers at 1% and food losses and wastes. This implies that male farmers have a greater tendency of food losses and wastages than their female counterpart, as the female farmers tend to utilized food product more to sustain the households demand than the males. This result contradicts the findings of Akerele *et al.* (2017) who reported that male farmers experience food loses more than the female farmers due to their large production scale.

Also, there is a negative significant relationship between household size at 1% and food losses and wastes. This implies that as the number of farm household members increases, they tend to maximize food usage and thereby reduce the food losses and wastes as there are enough family members to utilize the excess left over of the food product. More so, there is a negative significant relationship between frequency of power supply at 1% and food losses and wastes of the farmers. This implies that the

more the frequency of electricity supply the lower the food losses and wastes, as electricity is a vital factor for food storage due the perishability nature of agricultural produce. The result further revealed that the coefficient of awareness on environmental effects of food losses and wastes has a negative relationship with farm household food losses and wastes at 1% probability. This implies that increase in awareness on environmental effects of food losses and wastes would reduce the losses and wastes among households.

Table 3: Estimates of factors affecting farm household's food losses and wastes

Variables	Coefficients	Std. Error	t-value	Marginal effect
Constant	5.760***	0.909	6.33	
Age	0.001	0.003	0.35	
Gender	0.332***	0.087	3.80	0.332
Household size	-0.048***	0.012	-3.93	-0.048
Level of education	-0.009	0.010	-0.87	
No. of children aged between 6 to 11 years in household	0.046	0.035	1.32	
Presence of refrigerator	0.081	0.158	0.51	
Frequency of power supply	-0.381***	0.067	-5.68	-0.381
Awareness on environmental effects of food losses and wastes	-0.332***	0.104	-3.19	-0.332
Total income	0.282***	0.061	4.58	0.282
R^2	0.9243			
Adjusted R^2	0.9153			
F-value	103.11			
Prob>F	0.000			
Root MSE	0.247			

Source: Field Survey, 2024

Also, there is a positive significant relationship between income of the farmers at 1% and food losses and wastes. This implies that the higher the income of the farmers the more they tend to waste/losses more food as there is enough income to purchase more food item in the households compare to farmers with lower income which

tend to maximally utilize all the food items available in the households. This is in line with the result of Akerele *et al.* (2017) which showed that there is a positive significant relationship between income of the farmers and food security of the farming households.

Management strategies used by farm households to minimize food losses and wastes

The management strategies are those techniques employed by the farm households in order to prevent or minimize food losses and wastes. The findings in Table 4 indicated that the rural farm households in the study area are more engaged in the use of insecticides and pesticides, checking of expiration date before purchase and storing food in a sealed container as their major management strategies against food losses. This implies that pesticides and insecticides are used to prevent insect and pest attack on farm produce or stored product thereby minimizing food losses. Also, appropriate meal planning, acquiring more knowledge about cooking and avoid throwing away of leftover (give to charity) is the management strategies adopted by the farming households against food wastes in the study area. This implies that an appropriate meal plan will curtail the incident of leftover food which may result to food wastes and also knowledge of cooking will greatly help the households with different method of preparing meal which will last longer to be fully utilized by the households thereby preventing food wastage. This is in line with the finding of Williams *et al.* (2012) who reported that adequate food packaging prolongs the shelf life of the food product and reduces incident of food waste/losses associated with agricultural produce.

Table 4: Strategies used by farm households to minimize food losses and wastes

Strategies for food losses	Frequency*	Percentage
Use of insecticides and pesticides	80	93.02
Checking of expiration date before purchase	73	84.88
Storing food in a sealed container	36	41.86
Organize store food with first in first out (FIFO)	12	13.95
Strategies for food wastes		
Appropriate meal planning	80	93.02
Acquire more knowledge about cooking	56	65.12
Avoid throwing away of leftover (give to charity)	43	50.00
Use of refrigerator for storage	42	48.84
Make a weekly menu	14	16.28
Make a shopping list	12	13.95

Source: Field Survey, 2024 * Multiple responses

CONCLUSION AND RECOMMENDATIONS

The study concludes that over/excessive purchase, unfavorable weather condition and Pest, diseases and insect attack were the major causes of food loss. While inadequate storage facilities, unfavorable weather condition and inadequate power (electricity) supply were the major causes of food wastes among farm households. The study further concludes that gender, households size, frequency of power supply, awareness on environmental effect of food losses and wastes and total income were significant factors affecting farming households' food losses and wastes in the study area.

Based on the findings of this study the following recommendations have been proffered:

Farm households should avoid over/excessive purchase of food stuff by determining the household food requirement so as to reduce food losses.

The government should organize orientation on the training and importance of controlling Pest, diseases and insects to reduce food losses.

The farmers should through co-operative societies pull their resources together to build storage facilities in other to minimize food losses and allow for all year food availability.

Government should assist in providing stable power supply at affordable rate and educate the farmers on its utilization to ensure efficient food storage and prevent wastage.

Research institutes through the extension agent should assist in disseminating information and awareness on environmental effect of food wastes and best practices in food handling among local smallholder farmers to prevent food losses and wastes.

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