# Rural Women Involvement in Post-Harvest Rice Production Activities in Ekiti State, Nigeria

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*Authors' contributions*

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

*Original Research Article*

## ABSTRACT

Women play important roles in food production most especially in the rural areas of Nigeria. The study therefore assessed the involvement of women in post-harvest rice production activities in Ekiti State, Nigeria. A well-structured interview schedule was used to collect primary data from one hundred and twenty (20) women who were rice farmers. The data collected were analyzed using descriptive statistics and inferential statistics. The study revealed that the mean age of the respondents was 41 years. Majority of the respondents were married (90.0%) with an average household size of 6persons. High cost of mechanical threshing machine ($\bar{x} = 2.96$) and inadequate finance ($\bar{x} = 2.66$) were the major constraints to respondents' involvement in post-harvest rice production activities in the study area. The study recommends that women processors should form cooperative societies to procure combined harvesters, de-stoner, threshers and milling machines so as to reduce the drudgery involved in the processing of rice and rice processors should be given opportunity of financial assistance to procure essential storage equipment for their processing activities.

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## 1. INTRODUCTION

Several researches have established Nigeria as the current largest producer of rice in Africa. The annual rice production in Nigeria has witnessed an increase from the average of 5.5 million tons in 2015 to 5.8 million tons in 2017 [12]. Rice consumption had also increased because of its increased local production and also due to increase in population; the consumption rate now is 7.9 million tons. The increase in rice production in Nigeria is therefore not sufficient enough to meet the increase in consumption and population as the country imported about 3 million metric tons of rice in 2018 [1,3,7]. Several countries of Asia and Africa are highly dependent on rice as source of foreign exchange earnings and government revenue [11]. In Ekiti State of Nigeria, almost every rural and urban household consumes rice as an important staple food. Rice is an increasingly important crop in Nigeria. It is relatively easy to produce and it is grown for sale and for home consumption.

The post-harvest system consists of a set of operations which cover the period from harvest through to consumption. An efficient post-harvest system aims to minimize losses and maintain the quality of the crop until it reaches the final consumer. When food losses are minimized, both food security and income increase, and this is of vital importance for small and medium farmers, particularly in developing countries. In almost all rice growing areas in Nigeria, men traditionally undertake such activities as land preparation, ploughing, irrigation and field-levelling. Women on the other hand are responsible for sowing, transplanting, weeding and crop processing (Food and Agriculture Organization [4].

In Nigeria women participate effectively in agriculture [5]. However, despite their participation in agricultural sector, the economic and status of women remains low. Nigerian women still largely lack the opportunities of the men. The Nigerian female farmers are among the voiceless, especially in influencing policies and projects even though they continue to help to reduce hunger and achieve food security on the continent. Women's involvement in post-harvest food management is hindered by lack of access to appropriate technological tools, financial back up and access to relevant training. These necessitate rice processors to use manual processing. The study of the involvement of women in post-harvest rice production activities is important to practicing rice processors who may use it to improve on their performance. The study was designed to determine the level of women involvement in post-harvest rice production activities in the study area and ascertained the major constraints to women involvement in post-harvest rice production activities.

## 2. METHODOLOGY

### 2.1 Area of study

This study was carried out in Ekiti State, Nigeria. Ekiti State was created in 1996 as one of the 36 states of the Federal Republic of Nigeria. Ekiti State is made up of Sixteen (16) local Government Areas; it is located in South-West Nigeria with its headquarters in Ado-Ekiti. The State is located between longitude 4° 45' to 5°45' East of the Greenwich Meridian and latitudes 7°15' to 8°5' North of the Equator. The state has tropical climate with two seasons: rainy season (April –October) and dry season (November-March) while the annual rainfall varies from 2000 mm in the southern area to 1,150 in the Northern area. The soil is mostly well drained with medium to fine texture. The climatic situation and topography in the state supports both upland and lowland rice production.

### 2.2 Sampling Technique

A multistage sampling technique was used to select the respondents for the study. Firstly, three Local Government Areas (LGAs) namely; Irepodun / Ifelodun, Oye and Gbonyin were purposely selected for the study because there is high level production of rice and rice processing activities in the three LGAs . The second stage involves purposive selection of two communities from each of the LGAs based on the community's level of rice production, processing and harvesting making a total sample size of 6 communities . At the third stage, twenty (20) women rice processor were purposively selected from each community making a total of twenty (20) respondents per communities and forty (40) respondents per Local Government. This implies that a total of one hundred and twenty (120) respondents constituted the sample size for the study.

### 2.3 Sources of Data and Instrument of Data Collection

Data for the study was obtained from both the primary and secondary sources. The Primary

data was obtained through the use of a validated and reliable structured questionnaire while the secondary data was obtained from journals, textbooks and relevant published materials.

The study used both descriptive and inferential statistical tools for data analysis and this include frequency, percentages and mean for descriptive analysis and Chi square as inferential statistic for data analysis.

## 3. RESULTS AND DISCUSSION

### 3.1 Socio-economic Characteristics of the Respondents

The study shows that 52.5% of the women cassava processors in the study area were in the age bracket of 36-45 years, while 28.3% fell in the age bracket of 26-35 years with a mean age of 41 years as indicated in Table 1. This implies that majority of these respondents were still full of energy and in their productive age because there is possibility for younger women processors to work more than their older counterparts. It was revealed that 90.0% of the respondents were married, 5.0% widowed while 4.2% were single. This implies that married respondents were more engaged in rice processing than their unmarried counterparts in the study area. The high proportion of married respondents accounted for more members of farm families to be readily available to carry out rice post-harvest activities in the study area as suggested by a household of 6 persons on the average. The results in the Table 1 shows that majority of the respondents were Christians (92.0%) while 22.5% were Muslim.

From the result as shown in Table 1, 23.3% of the respondents had no formal education while 30.0% attempted primary education. This shows that the respondents had some level of formal education, that is, they are literate, and this will in turn influence the rate of adoption of innovations by the rice processors as opined by Asiabaka and Owens [2] that educational level is a very important determinant in adoption of innovation. This therefore supports the findings of Olumba [9] in a research carried out in Anambra state, where the majority of the farmers had primary level of education. Furthermore, majority of the respondents (65.8%) had a household size of 6-10 members and 34.2% of the respondents had a household size of 1-5 members. Which implies that the respondents. The more the household size the higher the availability of family labour for

agricultural activities [10]. However, Bola *et al,* [13] asserted that a large household size could also worsen the poverty situation of farming household particularly if it was composed of a large number of dependants, which means the family had more mouth to feed. The findings from the study also showed that 95.8% of the women who were involved in post-harvest handling were farmers by primary occupation, 2.5% of the respondents were civil servants while only 1.7% were traders by primary occupation. This implies that majority of the women were fully involved in farming. The result is in tandem with the assertion of Okunlola [6] that government intervention and incentives have encouraged many people to choose farming as their occupation.

### 3.2 Levels of Women Involvement in Post-harvest Rice Production Activities

The result in Table 2 revealed the level of women involvement in post-harvest rice production activities. Women rice processors were highly involved in drying winnowing, milling, packaging of rice, storing, marketing ($\bar{x} = 4.0$) respectively and Parboiling ($\bar{x} = 3.66$). This was because there is no much stress involved in all these activities, materials used were readily available and accessible, the cost was affordable and women didn't need to go to the market before they sell their processed rice as they could sell at the farm gate. Involvement in harvesting ($\bar{x} = 2.03$) and threshing ($\bar{x} = 2.03$) was on a low level of involvement due to stress involved, inaccessibility to modern equipment, inadequate labour to assist in harvesting and most of them do not have access to land. These finding support the results from a similar study in Ekiti State on the assessment of rice processing operations by Okunola *et al. [8]*. Their findings also recorded a high level of involvement of women farmers in post-harvest handling activities of rice.

### 3.3 Constraints Facing Women Involvement in Post-harvesting Activities

Table 3 indicated that high cost of mechanical threshing machine ($\bar{x} = 2.96$) was ranked as most difficult constraints by the respondents in the study area. According to the respondents, mechanical threshing is expensive therefore losses occur during threshing of rice paddy because they cannot afford the mechanical

threshing machine which led to reduction in quantity of paddy rice, also it is highly stressful threshing the paddy rice using local method apart from the stress the quality of rice is affected.

Inadequate finance ($\bar{x}$ =2.66) was ranked second. The responses of the majority of the respondents having problem with obtaining finance from private, public and government agencies was the requirement for collateral security before loans would be given out in the study area. Okunlola (2017), stated that women have issues with access to productive asset for

collateral security and also socio-cultural factors. Animal attacks during drying ($\bar{x}$ =2.55) was ranked the third constraint the respondents experienced. The responses of the majority of the respondents having problem with animal attack, is that when grains are being dried in the yard, goats and dogs eat them which led to shortage of paddy rice.

Losses due to over dried or undried paddy which leads to breakages during milling ($\bar{x}$ =2.44) was ranked fourth. Majority complained of the problem of undried paddy due to weather

**Table 1. Distribution of women according to their socio-economic characteristics**

| Socio-economic Characteristics | Frequency | Percentage | Mean ($\bar{x}$) |
|---|---|---|---|
| **Age** | | | |
| 26-35years | 34 | 28.3 | |
| 36-45years | 63 | 52.5 | 41 |
| ≥ 46 years | 22 | 18.4 | |
| **Marital Status** | | | |
| Single | 5 | 4.2 | |
| Married | 108 | 90.0 | |
| Widowed | 6 | 5.0 | |
| Divorced | 1 | 0.8 | |
| **Educational level** | | | |
| No formal education | 37 | 30.8 | |
| Attempted primary education | 36 | 30.0 | |
| Completed primary education | 2 | 1.7 | |
| Attempted secondary education | 17 | 14.2 | |
| Completed secondary education | 27 | 22.5 | |
| Attempted tertiary education | 1 | 0.8 | |
| **Household Size** | | | |
| 1-5 persons | 41 | 34.2 | |
| 6-10 persons | 79 | 65.8 | 6 |
| Primary Occupation | | | |
| Farming | 115 | 95.8 | |
| Civil servant | 3 | 2.5 | |
| Trading | 2 | 1.7 | |
| **Rice Processing Experience** | | | |
| 1-10 years | 86 | 71.7 | 10 |
| 11-20years | 26 | 21.7 | |
| 21-30years | 8 | 6.6 | |

*Source: field survey, 2017*

**Table 2. Level of women involvement in post-harvest production activities**

| Post activities | Always F (%) | Most times F (%) | Rarely F (%) | Never F (%) | Mean ($\bar{x}$) |
|---|---|---|---|---|---|
| Winnowing | 120(100.0) | - | - | - | 4.0 |
| Storing | 120(100.0) | - | - | - | 4.0 |
| Milling | 120(100.0) | - | - | - | 4.0 |
| Drying | 120(100.0) | - | - | - | 4.0 |
| Packaging of rice | 102(85.0) | 18(15.0) | - | - | 3.85 |
| Parboiling | 78(65.0) | 42(35.0) | - | - | 3.66 |
| Threshing | 1(0.8) | - | 63 (52.5) | - | 2.03 |
| Harvesting | 1 (0.8) | - | 63 (52.5\) | - | 2.03 |

*Ground mean=3.54 KEY: <3.51 = Low, >3.51 = high source: field survey, 2017*

**Table 3. Constraints to involvement post-harvest rice production activities**

| Constraints | Major constraints | Minor constraints | Not a constraint | Mean | Rank |
|---|---|---|---|---|---|
| High cost of mechanical threshing machine | 115(95.8) | 5(4.2) | - | 2.96 | 1st |
| Inadequate finance | 79(65.8) | 41(34.2) | - | 2.66 | 2nd |
| Animal attack during drying | 72(60.0) | 42(35.0) | 6(5.0) | 2.55 | 3rd |
| Losses due to undried paddy which leads to breakages during milling | 55(45.8) | 63(52.5) | 2 (1.7) | 2.44 | 4th |
| Access to mechanized/technological equipment | 40(33.3) | 80(66.7) | - | 2.33 | 5th |
| High cost of parboiling materials such as firewood, kerosene | 9(7.5) | 109(90.8) | 2(1.7) | 2.06 | 6th |
| High cost of transportation | 1(0.8) | 119(99.2) | - | 2.10 | 7th |
| Pest infestation during storage | 27(22.5) | 64(53.5) | 29(24.2) | 1.98 | 8th |
| High cost of labour | 1 (0.8) | 89 (74.2) | 30 (25.0) | 1.76 | 9th |
| Scarcity of labour during harvesting | 1 (0.8) | 85(70.8) | 34(28.4) | 1.73 | 10th |
| Complexity of a processing machine | 1 (0.8) | 16 (13.4) | 103 (85.8) | 1.18 | 11th |
| Poor access to market information | 2(1.7) | 9(7.5) | 109(90.8) | 1.11 | 12th |

*Field survey, 2017*

**Table 4. Correlation analysis between the socio-economic characteristics of the respondents and their level of involvement in post-harvest rice production activities**

| Variables | r-value | p-value | decision |
|---|---|---|---|
| decision | 0.24 | 0.01* | S |
| Household size | 0.11 | 0.22 | N/S |
| Annual income | 0.15 | 0.09 | N/S |
| Processing experience | 0.29 | 0.00* | S |

*Significant at p< 0.05; S=significant, NS= Not Significant, Source: Field Survey, 2017*
*Conclusion and Recommendations*

condition especially during the rainy season when they experienced more losses. Most of the respondents stated that machine inefficiency was another factor because some of the processing machine are old or not efficient. Breakdown of the machines also affect timing and availability of products which indirectly affects marketing and profit.

### 3.4 Testing of Hypothesis

The Age of the women rice farmers ($r$ = -0.24, $p$ = 0.01) had a significant negative influence on their level of involvement in rice post-harvesting activities as shown in Table 4. This implies that the older the respondents the less, women are involved in post-harvest rice production activities. The reason is because the older the women become, the less they are able to cope with the stress of post-harvest activities of rice. Results show that there was a significant correlation between years of experience ($r$ = 0.29, $p$ = 0.00) and women involvement in rice post-harvesting activities. This implies that, the more the processing experience of the respondents and the higher the tendency to be involved in rice post-harvesting. The household size and annual

income do not have a significant influence on the level of involvement in rice post-harvest activities among women in the study area.

### 4. CONCLUSION AND RECOMMENDA-TIONS

The study assessed women involvement in post-harvest rice production among rural dwellers in Ekiti State, Nigeria. The study revealed that majority of the respondents were still full of energy and in their productive age, married respondents were more engage in rice processing than their unmarried counterparts. High cost of mechanical threshing machine and inadequate finance were the most difficult constraints to respondent's involvement in post-harvest rice production activities in the study area.

Based on the findings of this study, the following recommendations were made:

1. Women who are into rice processing should form cooperative societies to procure combined harvesters, de-stoner, threshers and milling machines so as to

reduce the drudgery involved in the processing of rice.

2. Rice processors should be given opportunity of financial assistance to procure essential storage equipment for their processing activities.

3. In order to improve the economic empowerment of the women; the study recommends that organizations (both governmental and non-governmental) need to direct more resources towards expanding the rice processing business

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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