



Assessing the Effect of Post-harvest Income Losses on Rice Farmers in Nasarawa State, Nigeria.

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Abstract

For what has been a close observation, post-harvest income losses have been one of the major setbacks to farmers in Nigeria. Owing to this, the study aimed at assessing the effect of post-harvest income losses on rice farmers in Nasarawa State. A total of 200 farming households was sampled, using the multi-stage sampling technique. Data analysis was carried out through inferential statistics, with phased estimation of post-harvest losses and regression analysis. The ordinary least squares regression estimates showed that threshing losses and household sizes were significant determinants of rice farmers' income at 1% and 5% level probability levels respectively, while the analysis of constraints revealed that lack of harvesting equipment constituted a significant challenge to rice post-harvest loss remedy. The study concluded that threshing losses had adverse effect on rice farmers' income and thus, recommended renewed awareness campaigns and demonstrations on rice handling and post-harvest loss prevention so as to forestall future post-harvest income losses.

Keywords: *Effect, Post-harvest Income losses, Farmers, Rice, threshing losses, Nasarawa State, Nigeria.*

Introduction

Rice (*Oriza spp*) is undoubtedly a major staple food crop globally consumed by 3.5 billion people (over half of the world's population (WARDA, 2005). For the record, global production for 2014 to 2015 is forecast at a record 480.7million, while consumption and

residual for same period is put at 482.2 million tons, an increase of 1.5% from the preceding year (Appiah et al, 2011). Projections by Mejia (2001) indicated that 10 billion people will depend on it as main food by 2025, while demand will reach about 880 million tones. It is estimated that rice sustains the livelihood for 100 million people and its production has employed more than 20 million farmers in Africa (WARDA, 2005). Nonetheless, in Nigeria, its domestic production has never been able to meet the demand (Akinwunmi, 2011). According to FMARD (2011), the demand and supply gap in rice production has been widening, resulting in huge import bill. FMARD (2011) further opined that demand for rice in Nigeria is put at about 5 million metric tons a year out of which about 3.2 million metric tons are produced locally. Akinwunmi (2011) asserted that Nigeria is the second largest importer of rice, with a huge annual import bill of about ₦1 billion daily.

Post-harvest losses can occur during any of the stages in the postharvest operations. Whatever the source, postharvest losses represent more than just a loss of food as it ripples through the factors (including land, water, labour, seeds, time and fertilizer). The wastes indicate that post-harvest food loss translates not just into human hunger and minimizing the revenue of farmers but into tremendous environmental waste as well.

Hence, it was in a bid to enhance rice self-sufficiency in local production in the short term and increase export in the medium term, that the Presidential Initiative and National Special Programme for Food Security were implemented, with targets of 3 million hectare under cultivation, and 15 million tons of paddy rice or 9 million metric tons of milled rice (FMARD, 2011).

Despite these efforts, the nation is still unable to attain self-sufficiency in local production, partly due to huge post-harvest losses. Consequently, post-harvest losses have been a huge drain to local production, as colossal quantities of food, including rice are lost, year after year. Thus, It is against this backdrop that this study finds its main thrust in assessing the effect of post-harvest income losses on farmers in Nasarawa State, Nigeria.

Materials and Method

The study area is Nasarawa State. A multi-stage random sampling procedure was used for identifying respondents for the study. This was based on the rice farming household frame generated by the Federal Ministry of Agriculture and Rural Development under the Agricultural Transformation Agenda. The random selection of 10 LGA was followed by the random selection of 2 wards per LGA. This was proceeded by the sampling of 10 rice farming households from each ward, thus, yielding 20 households per LGA, resulting in 200 sampled households in the 10 Local Government Areas covered.

Data Analysis

Data analysis was carried out using inferential statistics (Regression analysis). Estimation of post-harvest losses at each stage of rice value chain was done through farmers recall and ordinary least squares regression model. The model to determine the effect of the post-harvest losses on rice farmers' income was expressed thus:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + b_{12}X_{12} + \mu \quad (1)$$

Y = Income from rice production (Naira) X1 = Harvest losses (Naira)

X2 = Threshing losses (Naira) X3 = Winnowing losses (Naira)

X4 = Transportation losses (Naira) X5 = Storage losses (Naira)

X6 = Parboiling losses (Naira) X7 = Drying losses (Naira) X8 = Milling losses (Naira) X9 = Household size (No.)

X10 = Educational Status of Farmer (Years) X11 = Age of Farmer (Years)

μ = Random error

Discussion of Findings

Table 1.1 Ordinary Least Squares Regression Result Estimates.

Variable	Linear (Y)	Exponential (LnY)	Cobb-Douglass (LnY)	Semi. Log (Y)
Constant	-154166.1	11.34759	12.19744 (3.46)	-74328 (-0.07)

	(-0.67)	(16.65)		
Harvesting loss (Naira)	15.95421 (0.10)	.0008033 (1.40)	.3357649 (1.17)	15511.29 (0.18)
Threshing loss (Naira)	-145.1184 (-0.89)	-.0013497 (- 2.68)***	-.4164918 (-1.55)	-121477.8 (-1.34)
Parboiling loss (Naira)	3.886633 (0.02)	-.0009149 (- 1.26)	-.4209802 (0.107)	-18688.22 (- 0.21)
Drying loss (Naira)	-146.1682 (-0.54)	-.0010002 (- 1.12)	-.1928298 (-0.81)	-48228.85 (- 0.63)
Winnowing loss (Naira)	31.0795 (0.68)	.0002249 (1.70)	.1300438(0.64)	20982.74 (0.32)
Storage Loss (Naira)	130.6458 (0.43)	-.0275594 (- 1.39)	.0328694 (0.13)	28009.07(0.33)
Transportation loss (Naira)	-101.153 (-0.36)	.0126553 (0.71)	.006826 (0.02)	-73336.74 (- 0.82)
Milling Loss (Naira)	124.8049 (0.50)	-.000513 (- 0.64)	-.0486675 (-0.17)	51955.25 (0.63)
Household Size (No)	33802.43 (1.57)	.0671848 (2.36)**	.7207343 (1.93)	73954.22 (0.58)
Age(years)	4423.467 (0.96)	.0023028 (0.12)	.2235754 (0.32)	250257 (1.02)
Years spent in School(yrs)	-4298.815 (-0.64)	-.0115355 (- 0.54)	-.0812345 (-0.57)	-68325.47 (- 1.46)
F	0.1331	0.0002	0.0380	0.1608
R²	0.0485	0.3160	0.2188	0.045
R² adjusted	0.0485	0.2315	0.1100	0.0453

Source: Author's Computation, 2021

The value of the R² implies that about 32% of the variation in the income of the rice farmers is explained by the eleven variables included in the model

altogether. Two variables were significant, with their coefficients conforming to the a priori expectations. Threshing losses (X₂) was significant at 1% and negative, implying that an increase in threshing losses will reduce rice farmers' income by the value of the coefficient. This result confirms the alternate hypothesis of this study which stated that post-harvest losses influence farmers' income in the study areas. The outcome is in line with the results obtained by Essiet (2014), who observed that post-harvest losses cause a reduction in rice farmers' income. In a related development PrOpcom (2007) revealed that a significant and positive correlation exist between income and the quantity of rice threshed.

Conclusion and Recommendation

The study concluded that threshing losses has a negative influence on rice farmers' income in the study areas. Losses from this source also constituted the bulk of losses encountered by rice farmers representing 25% of post-harvest losses, while the lack of processing equipment hindered processing operations. Arising from these, the study recommended renewed and continuous awareness campaigns through radio, pamphlets, leaflets, demonstrations on rice post-harvest handling and loss prevention by the Extension Component of the Niger State Agricultural Mechanization and Development Authority (NAMDA), the concerned Local Government Authorities and Nasarawa State Ministry of Agriculture, with a view reducing the proportion of post-harvest income losses on farmers. It is also imperative for NAMDA to link more rice farmers to the rice processing demonstration centers that abound in the State, under the National Programme for Food Security and the on-going Agricultural Transformation Agenda Rice Value Chain Initiative.

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