



**SOCIOECONOMIC ANALYSIS OF RICE FARMERS UPTAKE OF IMPROVED SEEDS FOR  
ENHANCED WELLBEING IN WUSHISHI COMMUNITY IN NIGER STATE, NIGERIA**

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**ABSTRACT**

The study analysed the socio-economic characteristics affecting rice farmers' uptake of improved seeds for enhanced wellbeing in Wushishi Community in Niger State. Data were collected through interview schedule and well structured questionnaire from 90 respondents. Data were analyzed using simple descriptive statistical tools. The result shows that 34.4% of the respondents were between the age ranges of 41 – 50 years. Most (93.5%) of the respondents had one form of education or others. Furthermore, 77.8% had farming experience of between 1 – 10 years. Majority of the respondent (73.4%) were small-scale rice farmers cultivating 1.51 – 2.50 hectares. Majority (77.8%) of the farmers obtained information about improved rice seeds from other farmers. Uptake of improved rice seeds significantly affected the respondents' sociological wellbeing in the areas of increased rice production ( $\bar{X}$ =4.63) and ability to send more children to school ( $\bar{X}$ =4.62). The most adopted improved rice seeds were FARO 52 and FARO 44 (SIPI). It is recommended that alternative extension services be provided to rice farmers to improve their uptake of improved seeds and there is need to subsidize farm inputs to farmers for convenient uptake of improved rice seeds for enhancing wellbeing. Variables that influenced the uptake of improved rice seeds were age (-110), family size (-0.75), farming experience (0.071) and access to extension agent (-1.602) which had significant relationship with improved rice seeds uptake.

**Keywords:** Rice farmers, improved rice seeds, Technology adoption, FARO 52, FARO 44 (SIPI).

**INTRODUCTION**

Rice is an annual crop and the most important staple food crop in tropical countries. Commercially, it is the most important cereal after wheat. It is widely consumed and there is hardly any country in the world where it is not utilized in one form or the other (Bamidele *et al.*, 2010). In Nigeria, rice is one of the few food item which consumption as no cultural, religious, ethnic or geographical boundary. Out of all the food items, rice is the most widely consumed, it has risen to a position of predominance with a total annual production of about 5 million metric tons, and it is the fourth largest cereal crop grown in the country behind sorghum, millet and maize (Basorun and Fasakin (2012; Akpokodje, *et al.*, 2001; Akande 1999). The importance of rice in Nigeria has gone beyond its present status as a primary staple food. According to NRDS (2014), it is a food security commodity while USAID (2009) reported that it serve primarily as cash crop for those farmers who produce it (selling nearly 80 percent of total production and directly consuming only 20 percent), and it generate more income for Nigerian farmers than any other cash crop in the country. Nigeria is West Africa's largest producers of rice, rice acculturation is widely spread within the country extending from the Northern to Southern Zones with most rice grown in the eastern and middle belt of the country. Consistently during the period of 2000 –2003 Niger and Benue states were the largest producer of rice. In 2001, Niger state produces over 500,000 metrics tons of rice, but of recent however, Kebbi is said to be the leading producer of rice because of the political will of the state government.

It is believed that awareness promotes demand, and demand is a force for rapid uptake and spread. Where farmers receive some seeds of a new variety without proper knowledge of its superiority, they simply sow it. Nigeria has the capacity to be self-sufficient in rice production as virtually all ecologies in the country are suitable for rice cultivation, however, as mentioned above, several literatures and official records have reported poor uptake of improved seeds among small scale farmers in Nigeria as the key factors responsible for low productivity, as such despite the high potentials associated with the use of improved seeds, its distribution and spread is very slow, which consequently affect it acceptance and uptake by the farmers (Akramov, 2009; Awotide, 2010). On this basis it is important to investigate the factors responsible for low uptake of improved seeds. The objectives of this study includes: to describe the socio-economic factors affecting the uptake of improved seeds, types and extent of uptake of improved seeds, effect of uptake of improved seeds on the wellbeing of the farmers and factors influencing uptake of improved rice seed by farmers.

**METHODOLOGY**

This study was conducted in Wushishi community of Niger State. Wushishi is a local Government Area in Niger State with its headquarter in Wushishi town, it has an area of 1879 kmsq and a population of 817,383 as at 2006 census in Nigeria and cover a land mass of 1,930,901sqkm. It share common boundary with Mariga, Mashegu, Gbako and Bosso Local Government Areas. The major ethnic groups are;



Gbagyi, Hausa and Nupes who are mainly grower of crops like rice, beans, maize and millet. Six (6) major rice producing villages were randomly selected from the community. Namely: TunganKawo dam, Maita, Kanko, Yalwa, Abba and Gwari Akare. A total of fifteen (15) respondents were randomly selected from each of the six (6) villages, making a total of 90 rice farmers. Primary data were collected with the administration of structured questionnaire(s) and interview schedule designed in line with the stated objectives of the study. Objectives were achieved using descriptive statistics which includes the use of frequency distribution tables, percentages and mean.

Relative Importance Index (RII) was used to analysed the effect of uptake of improved rice seeds on farmers socio-economic wellbeing, this was used as it revealed the specific area that contribute most to the respondents wellbeing.

$$RII = \text{Sum of weights} \\ (W_1+W_2+W_3+W_4+W_5+W_6+W_7+W_8+W_9+W_{10})/AXN$$

Where W= weight given to each effect which ranges from 1-5. 1= highly insignificant, 2= insignificant, 3= neither, 4= significant and 5=

highly significant. A=highest weight in this case is 5 and N= total number of respondents.

## RESULT AND DISCUSSIONS

The result in Table 1 revealed that majority (85.3%) of the respondents were within the age range of 20-50 years, it showed that most of the rice farmers were still within productive and active age. This agrees with the findings of Ekweanya *et al.* (2017), who reported that most of the farmers adopting new technologies were still in their active working ages.

The result further revealed that a good proportion (91.1%) had one form of education or the other. This implies that majority of the respondents had the capacity to read instructions that comes in most cases in English in adopting improved rice seeds. This is in line with the findings Nwokocha (2017), who pointed out that a large proportion of his respondents could read and comprehend the instructions on the instruction manual with little or no assistance. Table 1 also shows that 68.9% of the respondents had farm sizes of between 0.50-2.0 hectares, implying that most famers in the study area were small holder farmers.

**Table1: Socioeconomic characteristics of the respondents**

Variables	Frequency	Percentage
<b>Age</b>		
Below 20 years	6	6.7
20-30 years	16	17.7
31-40 years	30	33.3
41-50 years	31	34.3
51-60 years	7	7.8
<b>Level of Education</b>		
No formal Education	8	8.9
Primary Education	14	15.6
Secondary Education	62	68.7
Tertiary Education	6	6.7
<b>Years of Farming Experience</b>		
1 – 5	6	6.7
6 – 10	14	15.6
11 – 15	37	41.1
16 – 20	33	36.7
Above 20years	19	21.1
<b>Farm Size</b>		
0.50 – 1.00	8	8.9
1.01 – 1.50	12	13.3
1.51 – 2.00	42	46.7
2.01 – 2.50	24	26.7
3.1 – 3.50	2	2.2
Above 3.509	2	2.2

Source: Field Survey, 2017

Table 2 revealed that the awareness about improved rice seeds was on the high side; however the extent of trial and adoption varied greatly. The most adopted improved rice seed in the study area were FARO 44 (SIPI) and FARO 52 with high

extent of adoption, this may not be unconnected with their peculiar characteristics such as high yielding and early maturity. FARO 54 was moderately adopted while FARO 61 and 62 recorded low uptake rate, this may be because they



were relatively new seeds varieties that the farmers were not too conversant with, as farmers tend to

shine away from new practices that they have not find yet compatible with their existing practices.

**Table 2: Farmers awareness and extent of uptake of improved rice seeds**

Rice seed Varieties Cultivated	Aware (%)	Tried (%)	Adopted (%)	Extent of up take
FARO 52	100	87.50	76.67	High
FARO 44 (SIPI)	100	87.23	90.83	High
FARO 54	100	71.83	56.33	Moderate
FARO 61	84	52.3	32.7	Low
FARO 62	72	34.5	23.6	Low

Extent of uptake- 60% and above=High, 40%-59%=Moderate, less than 40%=Low

Source: Field survey, 2017

Table 3 shows the effect of uptake of improved rice seeds on the socioeconomic wellbeing of the rice farmers. The result showed that the uptake of improved seeds significantly affected rice farmer's wellbeing in the areas of: improvement in family food security status ( $\bar{X}$ =4.63), ability to send children to school ( $\bar{X}$ =4.62) and increase income ( $\bar{X}$ =4.58) which ranked 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup>, respectively. This implies that the uptake of improve rice seeds by the famers had significant and positive effect on their socioeconomic wellbeing. This is in line with the findings of Kadiri and Eze (2015), that rice farmers

in Niger Delta of Nigeria claimed to have increase yield, income, ability to train children in school and easy feeding and clothing as a result of uptake of improved rice seeds. Table 5 also indicated that the uptake of improved rice seeds does not significantly and positively affected the socioeconomic characteristic of the farmers in areas of marrying of more wives ( $\bar{X}$ =2.66) and improved sanitation ( $\bar{X}$ =1.91). This implies that rice farmers in the study area were more concerned with the improvement of their socioeconomic wellbeing than accumulating more liabilities.

**Table 3: Effects of uptake of improved rice seeds on the socioeconomic wellbeing of the rice farmers**

Variables	HI	I	N	S	HS	Sum	Mean	Rank	Remark
Increase food security through rice production	3	3	4	4	76	417	4.63	1 <sup>st</sup>	S
Increase income	4	4	3	4	75	412	4.58	3 <sup>rd</sup>	S
Infrastructural provision	21	16	14	17	22	273	3.03	7 <sup>th</sup>	S
Ability to acquire more assets	14	24	16	31	23	349	3.88	5 <sup>th</sup>	S
Access to rice marketing opportunities	18	28	6	8	30	271	3.01	8 <sup>th</sup>	S
Ability to send children to school	2	4	3	8	73	416	4.62	2 <sup>nd</sup>	S
Ability to marry more wives	23	32	8	7	20	239	2.66	9 <sup>th</sup>	NS
Improved sanitation	42	32	4	6	6	172	1.91	10 <sup>th</sup>	NS
Improved housing and clothing	18	14	6	21	31	303	3.36	6 <sup>th</sup>	S
Access to improved health care services	2	4	20	31	33	359	3.98	4 <sup>th</sup>	S

Source: Field Survey (2017)

Note: HI=High Insignificant, Insignificant=I, Neither=N, Significant=S, Highly Significant=HS, NS=Not Significant

The result in Table 4 shows that, the estimated model had a Pearson Goodness of Fit Test of Chi-square value of (154.822) which is significant at 1% level of probability. The coefficient of Age ( $X_1$ ) is significant at 1% level but negatively correlated with the adoption of improved rice seed. This implies that the older the farmer become's the rate of uptake of improved seeds decreases. The coefficient of family size is significant at 1% level but negatively correlated with improved rice uptake. This implies that as the family size increases the rate of uptake of improved

rice seeds reduces; this is because farmers with large family size are not likely to adopt new technologies because of financial constraint. Furthermore the farming experience of the respondents was significant at 5% level and is positively correlated with the uptake of improved rice seeds, which implies that as farming experience increases the rate of uptake of improved rice seeds will consequently increase. Access to extension service was significant at 1% level of probability but was negatively correlated with the uptake of improved rice seeds.



**Table 4: Factors influencing uptake of improved rice seed by farmers**

Variable	Coefficient	Standard Error	T-value	Sig
Constant	-4.939	1.570	9.893	0.002***
Age (X1)	-110	0.039	8.112	0.004***
Family size (X2)	-0.75	0.045	2.745	0.98*
Farm size (X3)	0.244	0.287	0.723	0.395
Farming exp (X4)	0.071	0.034	4.304	0.038
Edu level (X5)	0.034	0.042	0.651	0.420
Access to Ext Agt (X6)	-1.602	0.484	10.949	0.001***
Marital status (X7)	-598	0.550	1.182	0.277

Source: Field Survey 2017

Pseudo R<sup>2</sup> = 0.337

Chi-square value = 154.822\*\*\*

Note: \*\*\* = Significant at 1% \*\* = Significant at 5% \* = Significant at 10%

### CONCLUSION AND RECOMMENDATIONS

The study revealed that majority of the respondents were aware of the improved rice seeds existing in the study area, which includes majorly FARO 44 and FARO 52. The result showed that the uptake of improved seeds significantly and positively affected rice farmer's socioeconomic wellbeing in the areas of: improvement in family food security status ( $\bar{X}$ =4.63), ability to send children to school ( $\bar{X}$ =4.62) and increase income ( $\bar{X}$ =4.58) which ranked 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup>, respectively.

Based on the result of the findings, the following recommendation were made

1. Effort should be made to improve the frequency of contact of extension workers to rice farmers in creating awareness and to encourage them to adopt improved technologies,
2. Cooperative societies should be formed to enable rice farmer benefit from assistance usually rendered by government, NGOs and donor agencies,
3. There is also the need to subsidize farm inputs (improved rice seeds) to rural farmers to serve as a motivating factor and incentives to them.

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## EVALUATION OF FARMERS' KNOWLEDGE ON POST-HARVEST TECHNOLOGIES OF SOME SELECTED CROPS IN NORTH CENTRAL, NIGERIA

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### ABSTRACT

Post-harvest technologies are vital for several reasons. It is a major contributor to income and standard of living of farmers'. This position paper is aimed at evaluation of farmers' knowledge on post-harvest technology of some selected crop and challenges of post-harvest technologies in Nigeria. The position paper revealed that one of the major problem of food security in Nigeria is improper and inadequate knowledge on post-harvest technologies, which has resulted to 20-30% loss of agricultural produce annually and also hindered farmers from making more income and improved livelihood. It was stressed that increase in farmers' knowledge on post-harvest technologies will enhance their income and livelihood. This could also make food cheap and avoidable for consumers in the market thereby enhancing economic growth and development. The review revealed that improved in farmers knowledge on post-harvest technologies is the only solution to post-harvest losses in North Central Nigeria. It is recommended that attempts should be made by Agricultural extension agencies to arrange training, motivational campaigning and provide post-harvest technologies guide for increasing post-harvest knowledge of farmers. Also, it is recommended that action should be taken to provide technical support to the farmers to minimize their problems in cultivation, harvesting, post-harvesting and marketing.

**Keywords:** Postharvest technology, Farmers' knowledge, Economic growth, Loss of agricultural produce

### INTRODUCTION

Post-harvest can be defined as the stage of crop production immediately after harvesting. It involves stages such as drying, shelling, cleaning, sorting and packing (Vellema, 2008). Post-harvest technologies on the other hand can be defined as an inter-disciplinary science and methods applied to agricultural products after harvesting for the purpose of preservation, conservation, quality control/enhancement, processing, packaging, storage, distribution, marketing, and utilization to meet the food and nutritional requirements of consumers in relation to their needs. The roles of post-harvest technology in agricultural production cannot be over-emphasized, post-harvest technology enhance agricultural production by reducing post-harvest losses to the barest minimum, improves nutrition, adds value to agricultural products by opening new marketing opportunities, generating new jobs and enhance other related economic sectors for viable growth. However, the major problem food security in Nigeria is improper and inadequate knowledge on post-harvest technologies, which has resulted to 20-30% loss particularly this occurs as a result of post-harvest pests, this scenario most time force farmers' to sell their farm produce immediately after harvesting, only for them to buy it back at an exorbitant price in few months after harvesting. The potential increase in income and greater livelihood security will not be achieved if farmers' always sell surplus at the point of production (Saran *et al.*, 2012), this position paper evaluate farmers' knowledge on post-harvest technologies of some selected crops.

Objectives of the study are to;

1. Evaluate farmers' knowledge on post-harvest technology of some selected crops
2. Examine the challenges of post-harvest technologies in Nigeria

### Evaluation of farmers' knowledge on post-harvest technology of some selected crops

The research conducted by (Karnataka, 2006) on the knowledge of the tomato growers about improved production and practices indicated that nearly half the number of growers (49.14%) had medium level of knowledge on post-harvest technologies of tomatoes while only 27.50% had high knowledge on post-harvest technologies of tomato production. Tomato being a remunerative crop said by the author. He further stressed that farmers should possess complete knowledge of tomato production to get increased yields. Their knowledge regarding mechanical sorting and scientific grading by using recommended size and weight was very poor according to the author. The author stated that farmers packed their produce in big bamboobaskets. The processing of tomato was known to only 55% farmers. The author revealed that farmers were ignorant of appropriate post-harvest technology. It is of the opinion that adequate and proper understanding of post-harvest technologies will benefit the farmers'.

Findings from Javed (2013) on the knowledge of farmers in post-harvest handling of vegetable revealed that 56% of the respondents felt in medium knowledge category followed by 35.8% in high knowledge category and only 8.3% in low knowledge category. The author considered Knowledge as vision of an explanation in any



aspect of the situation regarding vegetable cultivation in the research work. The findings according to the author revealed that farmers most of the farmers' had moderate knowledge and not so good for handling of post-harvest technologies. Muhammad *et al.* (2012) on the assessment of the post-harvest knowledge of fruits and vegetable farmers in Garun Mallam L.G.A of Kano, Nigeria, showed that there is complete lack of proper post-harvest knowledge among the farmers, as only 10% of the respondents were found to harvest at an appropriate time of harvesting i.e. morning and evening. This findings is not that good to compel the menace of post-harvest losses in the study area.

Also observed from the result was that majority (95%) of the farmers harvest when it is fully ripe and only 5% harvest when half ripe. Some fruits and vegetables like tomatoes are best harvested when fully matured and still in the green stage, matured tomatoes stays longer as they ripen gradually while tomatoes that are already ripe will have a short storage life. The author further stressed that the losses recorded among the farmers was due to lack of proper knowledge and the use of local baskets in packaging of their produce after harvest, the basket are rough and easily bruises the produce and poorly ventilated, hence rot sets in.

Mande *et al.* (2007) on the Knowledge level of farm women about post-harvest technology reveals that almost all farmwomen possessed either high or low knowledge. The author indicated that (42.7%) have low knowledge. 86% of farmwomen possessed low knowledge about safe storage methods followed by practices. Also, control measures for storage pests (80.7%) storage pests and their nature of damage (80.0%), drying period for safe storage (67.3%), low cost storage structures (66.6%), making of processed products of fruits and vegetable (59.3%) and modern machinery for harvesting (54.0%). The researcher concluded that majority of farm women possessed low knowledge in these areas. The outcome of this findings is not that good since majorities possessed low knowledge which should have been high knowledge in order to curtail post-harvest losses. The post-harvest technologies to be effective farmers must possess high knowledge. The research carried out by Javed (2013) and Karnataka (2006) revealed that most of the farmers possessed moderate knowledge about post-harvest technologies which indeed should not have been so. Effort should be put in place for farmers knowledge to be revitalized.

#### **Challenges of post-harvest technologies in Nigeria**

Pan *et al.* (2008) stressed that the agricultural value chain comprises production, harvest, technologies and storage, processing, distribution and, finally, consumption.

Food loss occurs all along this chain but is most acute between harvest and distribution. In developing countries, the root causes of food loss are interlinked and complex, but the primary drivers include: lack of extension services to build skills in technologies, packaging, and storage; insufficient post-harvest storage facilities or on-farm storage technologies; and poor market access. Research and interventions in developing countries have largely focused on technology-based approaches that look for solutions to specific food loss problems at single points in the value chain for example, on-farm storage in hermetically sealed bags, fruit and vegetable refrigeration through solar powered coolers, and mobile drying systems for grain.

#### **Transportation challenge**

Transportation challenge because transport facilities are grossly inadequate, especially in the rural areas who are the major producers of food. Motorable roads are lacking and where available, they are not motorable throughout the year or are laced with potholes, which make it difficult for vehicles to get to the farm sites and convey farm produce to the markets. The bad roads have increased post-harvest losses through damage to farm produce (Labaris *et al.*, 2014).

#### **Inadequate infrastructures**

Inadequate infrastructures is another problem that affects post-harvest technologies in Nigeria. Infrastructures such as storage and warehousing are lacking in most part of the country. Insufficient storage facilities often lead to produce loss due to premature germination, fungal and bacterial attack, insects and rodents attack. This often led to increase marketing cost leading to higher retail prices and reduce marketing efficiency. Infrastructure in this instance is construed to include physical infrastructure, such as roads and railway system, educational and health facilities, social services such as potable water and electricity and communication system. (Caswell *et al.*, 2010). Agricultural performance in Nigeria is greatly impaired by the low level of development of infrastructure.

#### **Market information**

Market information is also lacking. Sellers and buyers are not well informed about the sources of food supply and thereby reducing potential efficiency in the market. Other facilities such clean environment, communication facilities, health facilities, fire services, banking facilities, security facilities, water supply and good toilets are also lacking in most markets (Rico *et al.*, 2007).

#### **Shortage of funds**

Adequate fund is required in the area of bulk purchases, development of storage facilities, transport and processing facilities. Sometimes prospective food marketers are often discouraged because of shortage of funds (Lu *et al.*, 2010)



### Shortage of processing facilities

Absence of these facilities sometimes compel farmers to sale perishable crops such fruits, tomatoes, orange, pineapple and bananas at low prices immediately after harvest to avoid post-harvest losses. This depresses the income of farmers, reducing his purchasing power and a result if food insecurity. The lack of adequate storage and processing facilities accounts for divergence between national food security and household food security. Even if the total production of food seems adequate at the aggregate level, it will not lead to significant improvement in food security unless the food is available for consumption at the right time and in the right form. Whereas food must be consumed on a daily basis, production has a different specific time profile. Storage and processing are critical in ensuring that the commodities produced at a particular period are available for consumption whenever and wherever they are required (Mbuk *et al.*, 2011). A significant quantity of products harvested in Nigeria perishes due to lack of storage and processing facilities. Simple, efficient, and cost effective technologies for perishables, such as roots, tubers, fruits and vegetables, are not as highly developed in the country compared to the storage technologies for cereal grains and legumes. Consequently, post-harvest food storage losses are very high, approximately 40 per cent for perishables, compared to cereal grains and pulses at about 15 percent. Traditional storage facilities have certain deficiencies, including a low elevated base giving easy access to rodents, wooden floors that termites could attack, weak supporting structures that are not moisture-proof, and inadequate loading and unloading facilities (Mbuk *et al.*, 2011).

### CONCLUSION

Post-harvest lossess has been serious issues affecting agricultural production in North Central Nigeria. This scenerio has not only negate the livelihood but also hampered economic development. However, for the menace of post-harvest lossess to be controlled to bearest minimum, farmers must possess adequate knowledge on post-harvest technologies of agricultural produce. Also, there is need to motivate farmers so that they can adopt modern post-harvest technologies of crops in order to minimize the post-harvest losses. Lastly, it is vital for farmers to use traditional post-harvest technologies in order to reduce post-harvest lossess and also enhance food security.

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