

An Analysis of Appropriateness of Improved Rice Technology for Women Farmers in Selected States of South Western Nigeria

Adewale, J.G.

*Department of Agricultural Economics and Extension, Ladoké Akintola University of Technology, P.M.B. 4000, Ogbomoso, Oyo State.
E-mail Address: jgadewale2002@yahoo.com*

Abstract

The study was carried out in selected states of South Western Nigeria in order to investigate the appropriateness of improved rice technology for women farmers. A purposive sampling technique was used to select 320 women farmers from the study area. Data collection was carried out using structured interview schedule. Frequencies, percentages and means were used to describe the data, while analysis of variance Pearson correlation and regression analysis were employed in order to make inferences from the data. The study revealed that majority (54.1 %) of the respondents were below 40 years of age, married (73.1%) and had less than 6 years of formal schooling (61.3%). The major income activities of the women were farming (crops and livestock). The women farmers were small holders as about 74.0% of them cultivated less than one hectare of land with rice. The predominant rice varieties in the study area were upland rice (ITA 128 and ITA 150). The analysis shows that significant relationship exists, though negative, between the women farmers' ages, income generating activities and levels of appropriateness of improved rice technology to them.

It is therefore recommended among others that women should be involved in the development process of improved rice production technology to ensure appropriateness of the technology and its adoption.

Key words: Appropriateness, Improved Rice Technology and Women Farmers.

Introduction

Rice is a major commodity in the world trade. Rice has become the second most important cereal in the world after wheat in terms of production, due to the recent decline in maize production (Jones, 1995). It is widely cultivated throughout the tropics, and where flood controls are effective as in South-East Asia. Much of the foreign rice imported into West African countries is from South - East Asia. As one crop contributing to the overall food security, rice is the staple food for more than half of the world's population. In terms of global food security requirements, it has

been argued that rice production must be increased by 70% to support the need of the world's population by 2025 (Riverose, 1994). In sub Saharan Africa, West Africa is the leading producer and consumer of rice (WARDA, 1996). West Africa accounts for 64.2% and 61.9% of the total rice production and consumption in sub-Saharan Africa respectively. Except for Burkina Faso and Niger, rice is a staple crop throughout West Africa. Nigeria ranks highest as both the producer and consumer of rice in the sub-region, the figures are slightly above 50% (WARDA, 1996). At the same time, new or improved technologies are also needed to

make rice production efficient, cost effective and sustainable for resource poor farmers. In keeping with the goals and objectives of the world food security policy, environment and technology development related to rice production must therefore respond to the needs of the crucial people involved in producing, providing and managing food supplies.

A worrisome phenomenon with rice production data in Nigeria is that, most of it is based on recycled information from Agricultural Development Project (ADP) rather than formal research. The ADP data are based on large-scale production. However, on ground, there are hardly large-scale rice farmers in Nigeria. The active rice producers are small holders who are left entirely on their own to keep the sub sector afloat (Selbut,2000).

Throughout the world, women historically have played and continue to play an important role in rice farming. Their roles and those of their male counterparts are conditioned by several interrelated socio-economic, political and environmental factors.

Women's involvement in rice farming varies from region to region and even within the region as shown by an example from West Africa. The percentage of labour supplied by women for rice cultivation varies from 35% for floating rice cultivation (using animal fraction) in Mali, to 80 -100% in mangrove swamp rice cultivation in Gambia and Liberia. In the latter case, women participate in most of the activities and usually undertake post-harvest processing of the crop (Nyanteng, 1985). In some parts of West Africa, where rice is cultivated on small plots of land for household subsistence needs, the role of women in rice cultivation is crucial.

Rural-urban migration of male agricultural labour makes availability of

labour source become increasingly scarce; because of this women participate more frequently in activities, which were traditionally demonstrated by men. Other factors that affect gender role in rice production included traditional methods of farming, introduction and diffusion of improved rice production including rice varieties, irrigation, herbicides, fertilizers, and pesticides.-Muslim and Muslim (2003) noted that on irrigated farms in Sulawesi Indonesia, women spent more time on farm duties than in rain fed farms but their relative share of labour and cash earning were lower than in rain fed areas. In the irrigated areas, women relative labour participation was higher in weeding, fertilizer application and harvesting tasks and lower in planting tasks in comparison with rain fed areas.

Improved agricultural technology has been widely recognized as a prime force for improved agricultural productivity, as well as an engine for accelerating rural economic growth. While rural women are knowledgeable about, and use a large amount of traditional technology, they have little access to modern technology that could benefit them in their activities.

Improved seeds, better irrigation, herbicides, chemical fertilizers and pesticides are not available for women farmers to improve their crop yields and augment aggregate food supplies. Where the technology and tools are introduced to communities to improve production or efficiency, they are often based on men's perception, which substantially differ from those of women farmers. Improved rice production could not get to an esteemed level without meeting the technology needs of women farmers involved in rice production.

Table 1: Distribution of respondents according to socio-economic characteristics N=320

Variables	Frequency	Percentage
Age (years)		
21 -30	44	13.8
31 - 40	129	40.3
41 -50	77	24.0
51 -60	54	16.9
61 and above	16	5.0
Marital status		
Married	234	73.1
Single	28	8.8
Divorced	41	12.8
Widow	17	5.3
Years of Education (years)		
0	141	44.1
1-5	55	17.2
6- 10	79	24.7
11 - 15	43	13.4
15 and above	02	0.6
Major income generating activities		
Trading & civil service	22	6.9
Marketing of agric produced	29	9.1
Processing of agric products	31	9.7
Livestock production	23	7.1
Cash crop production	37	11.6
Food crop production	178	55.6
Land tenure		
Purchase	58	18.2
Transfer by Spouse	137	42.8
Inheritance	43	13.4
Lease / Rent	74	23.1
Community land	08	2.5
Farm size (hectares)		
<0.4	4	1.3
0.4-0.9	230	72.9
1.0-1.5	4	1.3
1.6-2.1	5	1.6
2.2 - 2.7	24	7.5
2.8-3.3	47	14.7
3.4-3.9	6	1.9
Farming experience (years)		
< 10	99	31.0
11 -20	132	41.3
21-30	82	25.
31 and above	07	6 2.1
Sources of information		
Farmers groups	161	50.3
News paper	02	0.6
Television / Radio	33	10.3
Extension Agents	124	38.8

Source: Field Survey, 2004

Mean age = 40.9 years Mode = 33 years

Mean years spent in schooling =1.7 Years

Mean farm size = 1.045 hectare

Mean farm experience =15.8 years

This is because women participate virtually in all aspects of rice production ranging from nursery practices, to processing and marketing.

It is against this background that the study was expected to provide answers to the following research questions:

- (i) What are the current activities of women farmers in rice production in the study area?
- (ii) To what extent is the improved rice technology disseminated to the women farmers appropriate to them?
- (iii) Do the personal characteristics of women farmers affect the appropriateness of improved rice technology to them?

The study hypothesized that there are no significant relationships between selected personal characteristics of women farmers and level of appropriateness of improved rice technology to them.

Methodology

The study was carried out in two purposively selected states of South Western Nigeria. The selected states are Osun and Ekiti states. Osun, state is located in the rain forest zone, while Ekiti state is found in the savannah zone of the region. From the two states Ilesa and Ado Ekiti agricultural zones were purposively selected for the study because of their ecological potential in rice production.

Table 2: Distribution of respondents according to varieties of rice planted N=320

Varieties of Rice	Frequency	Percentage
Upland ITA 150	70	21.9
Upland ITA 128	153	47.8
Upland ITA 222	97	30.3

Source: Field Survey, 2004

Table 3: Distribution respondents according to the involvement in rice production activities

Scores on activities	Frequency	Percentage
19-23	15	4.7
24-28	141	44.1
29-33	48	15.0
34-38	48	15.0
39-43	8	2.5
44-48	18	5.6
49-53	42	13.1
Total	320	100.00

Source: Field Survey, 2004.

Mean score = 32.7 points, Expected maximum score = 57 points,
Expected minimum score = 19 points.

The target population for the study was women who were involved in rice production in the study area. A purposive sampling technique was used in selecting 160 women farmers from each state making a total of 320 respondents as the sample for the study.

A well-structured and validated interview schedule was used to elicit required information from the sampled women. Four specialists in rice production and improved technology for rice production conducted the face validity of the instrument and there was a very high agreement among them that the instrument would be able to measure the extent to which the improved technology in rice production was appropriate to the women.

Data analysis was carried out using descriptive statistics such as frequency counts, percentages, means and modes. Pearson correlation coefficients, ANOVA and regression analysis were employed as inferential statistical tools.

The dependent variable of the study is the level of appropriateness of improved rice technology for the women farmers. Twenty two items of improved rice technology were included in the

measurement. The level of appropriateness of improved rice technology to women was measured on a 5- point rating scale. The scale has the following 5 points: "very appropriate", "appropriate", "moderate", "not appropriate" and "not very appropriate" with corresponding values of 5, 4, 3, 2 and 1 respectively. The maximum obtainable score for an individual is 110 points while the minimum score is 22 points.

The independent variables included personal characteristics of the respondents such as age, marital status, income generating activities, years of formal schooling and involvement in rice production activities. Respondents were scored on 19 activities in rice production on 3-point scale of "actively involved", "partially involved" and "not involved" respectively assigned 3, 2, and 1 point on the scale. The maximum score for a respondent is 57 points while the minimum score is 19 points.

Results and Discussion

Table 1 shows that more than three quarters of the respondents were within the ages of 21

Table 4: Distribution of respondents according to level of appropriateness of improved rice technology to them

Level of appropriateness of improved technology	Frequency	Percentage
64-69	10	3.1
70-75	10	3.1
76-81	52	16.3
82-87	94	29.4
88-93	64	20.0
94-99	90	28.1
Total	320	100.0

Source: Field Survey, 2004
Mean score = 87.0 points

to 50 years (78.4%) with the mean age of 40.9 years and modal class of 33.0 years. About 73.0% of them were married and more than half (61.3%) of them had spent below 6 years in school for formal education. The major prominent income generating activities of the respondents are farming, marketing and processing of agricultural produce (93.1%). The result is in conformity with Saito and Weideman's (1989) findings that higher proportions of women in Nigeria were engaged in informal sector of the economy. The respondents indicated that they acquired land through transfer from their spouses (42.8%), while others rented (23.1%), inherited (13.4%), purchased (18.2%) their land for farming. This result conforms to the World Bank's (1994) report and Adewale's (2000) study that land was allocated to women by their spouses. This corroborates the claim that women farmers' access to land is often mediated through marriage. Majority (74.2%) of the respondents cultivated less than one

hectare of land with rice. The result is in line with Selbut's (2000) study that most of the active rice producers are small holders.

Data in Table 1 further show that about one-half of the respondents claimed that their source of information was through farmers groups (50.3%), while 38.8% of them sourced information from the extension agents. It may be implied that women farmers depended more on farmers' groups than Extension Agents for information on improved rice production technology. The result is a reflection of the mass sack of Extension Agents in one of the states in the study area. The majority (69.0%) of the women farmers had already spent more than ten years in rice production with the mean of 15.8 years. It implies that the respondents are not new entrants in rice production; they are old hands in rice production.

Majority of the respondents (69.7%) cultured upland rice varieties (ITA128 and ITA 150). This is conformity with the results of

Table 5: Distribution of respondents according to their categories on appropriateness of improved rice technology

Category	Scores (points)	Frequency	Percentage
Low	64-75	20	6.2
Moderate	76-87	146	45.7
High	88-99	154	48.1
	Total	320	100.0

Source: Field Survey, 2004

detailed analysis of the adoption of improved rice varieties that show that FARO 43 (ITA 150) has the highest number of adopters, followed by FARO 43 (ITA 128) in southwest Nigeria (Adewale, 2004). It has also been found that cultivation of rice on hills is becoming

increasingly important in Ilesa of Osun state; the three local government areas of Effun ridge of Ekiti state of southwestern Nigeria, namely Effun-Alaya, Ekiti West, Igbemo-Irepodun-Ifelodun local government areas (Imolehin Wada, 2000; Singh *et al.*, 1997).

The result of the survey in Table 3 shows that the mean score in rice production activities is 32.7 points. The majority (63.8%) of respondents falls within the mean score and

Table 6: Result of Pearson correlation analysis (r) between selected variables and level of appropriateness of improved rice technology

Selected Variables	r- value
Age	-0.356*
Socio economic status	-0.566*
Education	-0.032
Farming experience	-0.222

Source: Field Survey, 2004. * Significant at 0.05 level

below in rice production activities, while others (36.2%) were involved in rice production activities above the mean score. It could therefore be inferred from the result that majority of the women farmers were not involved in most of the rice production activities.

Data in Table 4 show that scores on appropriateness of improved rice technology to majority (51.9%) of the respondents are average or below while others (48.1%) had their scores on appropriateness of improved rice technology to be above the mean score.

Table 7: Result of regression analysis between some independent variables and level of appropriate improved rice technology.

Variables	B	Standard error	Calculated t Value	Remark
Constant	68.78	4.46	15.43	
Age(X ₁)	0.10	0.04	2.74	S
Years of schooling (X ₂)	0.14	0.08	1.70	NS
Marital status (X ₃)	-6.34	0.34	-0.19	S
Income generating activities (X ₄)	-1.04	0.21	-4.86	NS
Source of information (X ₅)	0.75	0.43,	1.74	NS
Contact with extension (X ₆)	-0.49	0.22	-2.17	NS
Land tenure(X ₇)	-4.74	0.02	-0.03	S
Area cultivated with rice (X ₈)	-2.21	0.45	2.31	NS
Farming experience (X ₉)	5.13E-02	0.05	1.11	NS
Rice production activities (X ₁₀)	0.42	0.05	8.94	S
Area cultivated with upland rice (X ₁₁)	1.04	0.45	2.37	NS

Source: Field Survey, 2004.

F = 32.7, R² = 0.60

S - Significant at .01 level NS - Not Significant at 0.05 level

The respondents were categorized based on their scores on appropriateness of the improved rice technology to them. The result of the categorization in Table 5 shows that the improved rice technology is either moderately or highly appropriate to most (93.8%) of the respondents. The moderate or high level of appropriateness of the improved rice technology among the respondents would foster its adoption by them.

The evidence of data analysis in Table 6 shows that there is negative and significant relationship between respondents' age ($r = -0.356$) and the levels of appropriateness of improved rice technology to them. It is implied that the older the respondent, the less the improved rice technology is appropriate to him or her.

Also, negative and non-significant relationships exist between respondents' years of formal education ($r = -0.032$), farming experience ($r = -0.222$) and levels of appropriateness of improved rice technology to them. By inference, therefore, respondents' formal education and rice farming experience have no significant relationships with the levels of appropriateness of improved rice technology to them.

The results of regression analysis reveal that respondents' age, level of involvement in rice production activities have positive and significant contribution to the levels of appropriateness of improved rice technology to them (Table 7). The older the respondent the more appropriate is the improved rice technology to him or her. Similarly, the higher the respondent's level of involvement in rice production activities,

the more appropriate is the improved rice technology to him or her.

The results further reveal that 60.0% of the level of appropriateness of improved rice technology to the respondents could be explained by the independent variables with F-ratio of 32.7 at 1 % level of significance.

Conclusion and Recommendations

Most of the women farmers in the selected states were found to be in their middle age and their major occupations are farming, marketing and processing of agricultural produce. Farmers group is the major source of information to the women farmers. The improved rice technology is either moderately or highly appropriate to most of the respondents. The moderate or high level of appropriateness of the improved rice technology among the respondents would foster its adoption by them.

The older the respondent the more appropriate is the improved rice technology to him or her. Also the higher the respondent's level of involvement in rice production activities, the more appropriate is the improved rice technology to him or her. In order to further enhance appropriateness of improved rice technology to women farmers the following recommendations are therefore proffered:

1. Women should be involved in the development process of improved rice production technology to ensure appropriateness of the technology to them and its adoption.
2. The government should strengthen the women groups since they form the major source of information on agricultural practices; these groups could

be focused as a means through which agricultural technology could be developed and disseminated to women farmers.

3. There is need to increase the literacy level of women to broaden their horizon of knowledge and abilities in development of appropriate technology.

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