



Productivity and Gender/Intra-Household Roles in Rice Production in Awka North Local Government Area, Anambra State, Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The study ascertained productivity and gender/ intra-household roles in rice production in Awka North Local Government Area, Anambra State, Nigeria. Ninety farmers selected from three and nine town and village communities respectively constituted the respondents for the study. Data were analysed with percentage, mean score and analysis of variance (ANOVA). Findings show that majority (53.3%) of the respondents were females who were married (58.9%) with a mean household size of 6 persons, mean farming experience of 14 years and mean age of 40 years. Greater proportion (57.8%) engaged in farming as their primary occupation with a mean monthly income of 28,294.44 Naira. On average they owned 2.7 hectares of land and cultivated 1.7 hectares of the land with rice. Their mean output and yield from rice production were 3.2 tonnes and 1.4 tonnes/hectare respectively. Youths anchored most activities of rice production. Hence there is need for the government to enact policies and initiate programmes aimed at attracting youth to rice production and agriculture generally so as to reduce restiveness among youths, channel their energy and expertise towards achieving food security as well as agriculture and economic growth and development.

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1. INTRODUCTION

Rice has a great potential and can play crucial role in contributing to food and nutritional security, income generation, poverty alleviation and socio-economic growth in Nigeria [1]. Rice is consumed by over 48 billion people in 176 countries and it is the most important food crop for over 2.89 billion –people in Asia, over 40 million people in Africa and over 150.3 million people in America [2]. Rice being a major staple food for a large part of the world's population is one of the mostly consumed foods in Nigeria. [3] noted that Nigeria per capita consumption levels of rice is growing significantly at 7.3 percent per annum.

According to [4], rice is rich in carbohydrates and proteins and is used mainly for human food consumed in the form of whole grains. It provides more calories and protein than cassava, maize or sorghum/millet. It is also eaten in the form of parched rice, rice flour, rice flakes, puffed rice and rice pudding. Rice flour is used in confectionery, rice cream, pudding and pastry.

Rice had assumed a cash crop status most especially in the producing areas where it provides employment for the inhabitant of the area. The activities involved in rice production contribute in provision of job opportunities, particularly at the rural communities as a result of production, processing, storage and marketing [2].

The demand for rice in Nigeria had been soaring and the rising demand was partly as a result of increased income levels, rapid urbanization and associated change in occupational structure [5]. However, this demand has not been met by domestic production. Thus, there is significant gap between the production and consumption level of rice which is revealed by increasing importation of rice in order to meet increasing demand/ consumption of rice.

Several agricultural policies, programmes and researches may have been initiated to boost agricultural outputs and yields including rice. These tools tend to tackle issues on rice and agriculture holistically with little or no reference to gender. Hence sex disaggregated data are not common in researches. Gender studies tend to show differences with respect to gender on specific subject thereby pointing at methods to

be adopted in handling different gender or clients in agriculture for a positive result.

Consequent upon these facts, the study was carried out to ascertain productivity and gender/intra-household roles in rice production in Awka North Local Government Area of Anambra State. Specifically, the study

- characterized (personal and socio-economic characteristics) rice farmers in the study area;
- ascertained their activities and productivity in rice production;
- ascertained gender/ intra-household (men, women, youth and children) roles in rice production in the area and
- drew implication for policy and sustainable agricultural growth and development.

2. METHODOLOGY

2.1 Area of Study

The study area, Awka North Local Government Area Anambra State is located at the Eastern part of Nigeria. It lies approximately between latitude 6°30' to 6°47' and longitude of 7°30 to 7°37' [6] and shares boundaries with Ayamelum L.G.A in the North, Anaocha and Orumba North L.G.A in the south, Dunukofia L.G.A in the east and Uzo Uwani L.G.A of Enugu State in the West [7]. This area has a tropical climate marked by distinguished dry and wet seasons and a favourable soil for agricultural activities. Thus most of the inhabitants are either full time or part time farmers. They produce crops like yam, cassava, rice, maize banana, potato etc.

Awka North Local Government Area has a population of one hundred and twelve thousand six hundred and eight (112,608) people, comprising fifty nine thousand one hundred and twenty eight (59128) males and fifty three thousand four hundred and eighty (53480) females [8]. It is made of nine (9) town communities which include Amasea, Isu-Aniocha, Mgbakwu, Urum, Amanuke, Achalla, Ebenebe, Ugbenu and Ugbene.

2.2 Population and Sample

Multi-stage sampling technique was used to select the respondents for the study as follows;

Stage one: from the nine (9) town communities in the L G A, three (3) town communities (Ebenebe, Amanuke and Achalla) were purposively selected due to their high level of involvement and productivity in rice enterprise.

Stage two: Three villages were selected from each of the selected town communities using simple random sampling technique giving a total of nine village communities for the study.

Stage three: from each of the selected villages, ten (10) rice farmers were selected using simple random sampling technique giving a total of ninety respondents (rice farmers) for the study.

2.3 Data Collection

Data for the study were collected from the respondents through the use of semi- structured questionnaire/interview that were administrated by the researcher to the respondents.

The instrument contained relevant information based on the objectives of the study as follows:

In order to characterize the farmers, information were collected on the following; age, sex, marital status, educational qualification, farming experience (in years), income (in Naira), number of bags produced per farming season, house hold size, primary occupation among others. Types/sources of seed grown, cropping pattern, farm size, output and yield from rice production were variables captured under activities and productivity of the farmers. Data on gender/ intrahousehold (men, women, youths and children) roles in rice production were collected with the aid of four (4) point Likert scale with response options as often (4), sometimes (3), occasionally (2) and not at all (1) with mean of 2.5. Any variable with a mean score equal or greater than 2.5 was regarded as a role played by the gender while any variable with a mean score less than 2.5 was regarded as a role not played by the gender. Data were further subjected to analysis of Variance (ANOVA) in order to detect area/s where difference/s exist in the roles played by gender and other members of the household.

Percentage, mean score and analysis of Variance (ANOVA) were used in analyzing the data.

3. RESULTS AND DISCUSSION

3.1 Personal Characteristics of the Farmers

3.1.1 Age

Table 1 shows that the higher proportion (28.9%) of the rice farmers were within the age range of 31-40 years, 24.4% were within the age range of 41-50 years, 20% were within the age range of 21-30 years while 16.7% were within 51-60years. The mean age of the respondents was 40 years. This implies that these farmers were still in their productive age and thus have higher propensity to learn and acquire new farming practices. Unlike aged farmers that are often not amenable to changes and are neither likely to adopt improved technologies nor have the physical strength to do manual work as the younger ones [9,10].

3.1.2 Sex

Table 1 reveals that the majority (53.3%) of the respondents were female while the rest (46.7%) were male. This high proportion of female in their sex distribution suggests active roles of women in rice production and agriculture generally. On the other hand, manual operations in rice production which is evident in developing countries are labour intensive hence may not be easy for women who are weaker sex and are more engaged in unpaid domestic chores.

3.2 Marital Status/ House-hold Size

The table also reveals that higher proportions (58.9%) of the respondent were married while 21.1% were single. Result in Table 1 also shows that higher proportion (51.1%) of the respondents had 1-5 persons while 40% had 6-10 persons in their households. Their average household size was six persons. These show that the respondents are married with moderate house hold size. Thus, large household size is expected to enhance labour availability [9]. However, labour availability through household depends on the age structure of the household members such that households with more members at middle/productive age are more likely to have/benefit from family labour.

Table 1. Personal characteristics of the respondents

Parameter	Frequency	Percentage (%)	Mean (x)
Age (in year)			
Less than 21	3	3.3	40
21-30	18	20.0	
31-40	26	28.9	
41-50	22	24.4	
51-60	15	16.7	
Above 60	6	6.7	
Gender			
Male	42	46.7	
Female	48	53.3	
Marital status			
Single	19	21.1	
Married	53	58.9	
Widowed	12	13.3	
Divorced	6	6.7	
Level of education			
No formal education	26	28.9	
Primary school level	26	28.9	
Secondary school level	23	25.6	
Tertiary	15	16.6	
Household size			
1-5	46	51.1	6
6-10	36	40	
11-15	8	8.9	

3.3 Educational Background

Result in Table 1 reveals that 28.9% of the respondents had no formal education, another 28.9% attended primary school while 24.6% attended secondary school. Thus on aggregate resolution, the majority (71.1%) of the respondents were literate. This implies that these rice farmers will readily adopt and practice innovations if exposed to them. This is because education enhances acquisition and utilization of information on improved technology by the farmer as well as their innovativeness [9,11,12].

3.4 Socio-economic Characteristics of the Farmers

3.4.1 Primary and secondary occupations

Entries in Table 2 show that greater proportion (57.8%) of the respondents engaged in farming while 22.2% engaged in trading as their primary occupations. Table 2 further shows that greater proportion (42.2%) of the respondents engaged in farming while 27.8% engaged in trading as their secondary occupations. This is in line with [13] who reported that major economic activities of the rural people are found in agricultural occupations.

3.4.2 Farming experience

Table 2 shows that 27.8% had been engaged in farming for 6-10 years, 22.2% for less than 6 years, 21.1% had been engaged in farming for 11-15 years while 20.0% had been engaged in farming for more than 20 years. Average farming experience of these farmers was about 14 years. This implies that majority of the respondents were experienced in farming. Farming experience may be said to be the "best teacher" and determinant of profitability in agriculture because it allows farmers to detect and adjust their enterprises to changing climatic, social and economic conditions and carry out their farming activities with precision in output, yield, demand and income.

3.4.3 Monthly income

Table 2 further reveals that about 34% of the respondents earned ₦20,001 to ₦30,000, 18.9% earned ₦10,001 to ₦20,000 while 15.6% earned ₦30,001 to ₦40,000 as their monthly income. The mean monthly income of the respondents was ₦28,294.44. This may imply that the farmers in the area are relatively poor which is one of the characteristics of farmers in developing countries.

3.5 Cropping Pattern, Types and Sources of Seed Grown

Table 3 shows that about 34% of the respondent grew a variety of rice called MARZ, 31.1% grew R-Box, 17.8% grew FARO-45, 15.6% grew 1416 and 13.3% grew BJ. Further, from the table majority (66.7%) of the respondents obtained these varieties they grew from stored seeds of previous farm produce, 27.8% obtained theirs from the market (seed dealers), 4.4% obtained from research institutes while the rest (2.2%) obtained from extension agents. Since majority

(66.7%) of the respondents made use of their stored seeds that is recycling previously used varieties, it may imply that the respondents did not source or use new improved varieties in rice production and this may negatively affect output and yield from their rice enterprise. This finding is in line with [4] who reported that the low productivity of farmers is due to several constraints including poor seed management. Farmers should consult the nearest agricultural office or seed companies for certified seeds of recommended varieties in their areas [14] in order to access better rice seeds for planting.

Table 2. Socio-economic characteristics of the respondents

Parameter	Frequency	Percentage (%)	Mean (x)
Primary occupation			
Farming	52	57.8	
Trading	20	22.2	
Teaching	7	7.8	
Palm wine tapping	0	0	
Civil service	2	4.2	
Others (as meson, hair dresser auto mechanic, commercial phone call business etc)	9	10	
Secondary occupation			
Farming	38	42.2	
Trading	25	27.8	
Teaching	2	2.2	
Palm wine tapping	5	5.6	
Civil service	3	3.3	
Others (as meson, commercial phone call business etc)	5	5.6	
None			
Farming experience (years)			
Less than 6	20	22.2	
6-10	25	27.8	
11-15	19	21.1	
16-20	8	8.9	
Above 20	18	20.0	
Monthly income (₦)			
Less than 11,000	13	14.5	
11,001-20000	17	18.9	
20,001-30,000	31	34.4	
30,001-40,000	14	15.6	
40,001-50,000	12	13.3	28,294.44
Above 50,000	3	3.3	

Source: Field Survey; August, 2009

Table 3. Distribution of respondents on types/ sources of seed grown and cropping pattern

Pre-planting and planting operations	Frequency	Percentage (%)
Varieties		
BJ	13	13.3
MARZ	31	34.4
FARO 45	16	17.8
1415	14	15.6
R Box	28	31.1
Source of seed*		
Stored seed personal resources	60	66.7
Market	25	27.8
Research institute	4	4.4
Extension Agent	2	2.2
Cropping patterns		
Sole	81	90
Mixed	9	10

*Multiple responses

3.5.1 Cropping pattern

Table 3 shows the cropping patterns used by the rice farmers. The majority (90%) plant rice solely while the rest (10%) planted rice with other crops. Field observation showed that the few that practiced multiple cropping, intercropped rice with maize, palm trees, cocoyam and other crops. Although these farmers practiced mono cropping, multiple cropping may be said to be more advantageous especially in this era of uncertainties associated with agriculture and economic doom because it helps the farmers to overcome risk of climate change and crop failure.

3.6 Productivity of Rice

3.6.1 Farm size

Entries in Table 4 reveal that greater proportion (48.9%) of the respondents owned a farm land within the range of 1 to 2.9 hectares, 17.8% owned 3 to 4.9 hectares, 15.6 owned 5-6.9 hectares while 13.3% owned farm land less than 1 hectare. The average farm size of the respondents was 2.7 hectares. This finding is consistent with [15] who reported that the major occupation in the area was farming with land holding ranging from 2-3 hectares per household on the average. The Table also shows that the majority (62%) of the respondents cultivated rice on 1 to 2.9 hectares of land, 18.9% of them cultivated in less than 1 hectare while 16.7% cultivated on 3 to 4.9 hectares of land. Thus the respondents cultivated 1.7 hectares of land with rice on average. The result suggests that the respondents did not cultivate the entire land they owned with rice probably because many of them

practiced mono-cropping in rice farm. Hence they may need to cultivate other staple crops like maize, cassava, vegetables etc in some of their lands for consumption and commercial purposes.

3.6.2 Output and yield of rice

Table 4 shows that 43.3% of the respondents produced 1 to 2.9 tonnes of rice 24.4% produced 3 to 4.9 tonnes, 17.8% produced 5 tonnes while the rest (14.5%) produce less than 1 tonnes. The average output of the respondents was 3.2 tonnes of rice. The table also reveals that majority (55.6%) of the respondents obtained rice yield of 1 to 1.9 tonnes/hectare, 23.3% obtained less than 1 tonne/ha while the rest (21.1%) obtained 2 to 2.9tonnes/ha. The average yield of rice obtained by the respondents was 1.4 tonnes/ha. This average yield (1.4 tonnes/ha) is very low when compared with 3.0 tonnes/ha in places like Cote d' Ivoire and Senegal (1) and that of the world average yield of 3.84 tonnes/ha [4].

3.7 Gender/intra-household Roles in rice Production

3.7.1 Roles of men

Data in Table 5 reveal that men were role players in acquisition of land (x=3.84), land clearing (x=3.68), milling (x=3.23) agrochemical application (x=3.44), procuring of seeds (x=3.34), threshing (x=3.23) and fertilizer application (x=3.19). They equally partook in storage (x=2.98), bagging (x=2.94), and marketing/supply (x=2.51). This finding shows that adult males participated in many operations of rice

production in the area contrary to [16] that are increasingly being involved in traditional male tasks such as land preparation, irrigation and threshing. posited that traditional labour tasks have changed due to lack of male labour and women

Table 4. Distribution of respondents on farm size and productivity of rice

Parameter	Frequency	Percentage (%)	Mean (x)
Total farm size (Ha)			
Less than 1	12	13.3	2.7
1-2.9	44	48.9	
3-4.9	16	17.8	
5-6.9	14	15.6	
7 and above	4	4.4	
Portion cultivated with rice (Ha)			
Less than 1	17	18.9	1.7
1-2.9	56	62.2	
3-4.9	15	16.7	
5 and above	2	2.2	
Output (Tonnes)			
Less than 1	13	14.5	3.2
1-2.9	39	43.3	
3-4.9	22	24.4	
5 and above	16	17.8	
Yield (T/Ha)			
Less than 1	21	23.3	1.4
1-1.9	50	55.6	
2-2.9	19	21.1	

Table 5. Roles and differences in various roles played by gender/members of household in rice production

Activities	Men	Women	Youth	Children	Sig.
Land acquisition	3.84	1.64	1.73	1.17	0.00*
Land clearing	3.68	2.36	3.83	1.32	0.74
Procurement of seeds	3.34	2.92	2.90	1.23	0.00*
Ploughing of the soil	2.66	3.48	3.52	1.36	0.88
Nursery preparation	2.43	3.63	3.32	1.23	0.00*
Planting	2.41	3.79	3.53	1.31	0.00*
Transplanting	2.07	3.80	3.43	1.37	0.00*
Weeding	1.46	3.97	3.11	1.84	0.00*
Fertilizer application	3.19	2.97	3.71	1.31	0.00*
Agrochemical application	3.44	2.33	3.76	1.14	0.00*
Trapping of rodents	2.09	1.84	3.12	2.87	0.08
Making scare crows	2.10	2.00	3.16	2.87	0.00*
Harvesting	2.94	3.16	2.68	1.32	0.00*
Threshing	3.23	2.69	3.63	1.68	0.00*
Soaking	1.76	3.83	2.66	1.50	0.00*
Steaming	1.71	3.90	2.67	1.29	0.00*
Milling	3.3	2.07	3.42	1.17	0.00*
Bagging	2.94	3.08	3.63	2.12	0.00*
Storage	2.98	3.0	3.57	1.51	0.00*
Marketing/supply	2.51	3.81	2.54	1.18	0.00*

Significant at less than or equal to 0.05 * = significant

3.7.2 Roles of women

Entries in Table 5 show that women were role players in weeding ($x=3.97$), steaming ($x=3.90$), soaking ($x=3.83$), marketing ($x=3.81$), transplanting ($x=3.80$), planting ($x=3.79$), nursery preparation ($x=3.63$), puddling of the soil ($x=3.38$), harvesting ($X= 3.16$), bagging ($x=3.08$), storage ($x=3.00$), fertilizer application($x=2.97$) and threshing ($x=2.69$). This is in accordance with [17] who emphasized that the activities related to planting. Weeding, harvesting and processing are in the domain of women. [4] also noted that women engage in both pre-harvesting, transplanting, weeding, harvesting etc and post harvest operations (packing, threshing, drying, parboiling, storage and marketing).

3.7.3 Roles of youths

Data in Table 5 show that youth were role players in rice production in areas like land clearing ($x=3.83$), agro chemical application ($x=3.75$), fertilizer application ($x=3.71$), harvesting ($x=3.68$), bagging ($x=3.63$), storage ($x=3.57$), planting ($x=3.52$), transplanting ($x=3.43$), milling ($x=3.42$), nursery preparation ($x=3.32$), making scare crows ($x=3.16$), trapping rodents ($x=3.12$), weeding ($x=3.1$), procurement of seeds ($x=2.90$), steaming ($x=2.67$) soaking ($x=2.66$) and marketing/supply ($x=2.54$).

3.7.4 Roles of children

Table 5 shows that children were role players only in trapping of rodents ($x=2.87$) and making scare crows ($x=2.68$). This finding is in line with [4] that stress that children assist in bird scaring.

3.8 Differences in Various Roles Played by Gender/Members of the Household in Rice Production

Result in Table 5 also reveals that there were significant differences in most of the activities engaged by different members of the household in rice production as can be proved by $t<0.05$ in the specific roles. These differences existed in land acquisition, procurement of seeds, weeding, steaming, soaking, marketing, nursery making, planting, transplanting, fertilizer application, agro chemical application, making scare crows, trapping of rodents, harvesting, threshing, soaking, steaming, milling, bagging, storage and marketing/supply. Thus showing that male were more involved in land acquisition, procurement of seeds and milling while women were more

involved in nursery making, planting, transplanting, weeding, soaking, steaming and marketing. Youths were more involved in fertilizer and agrochemical application, making scare crows, harvesting, threshing, bagging and storage. This can be proved by higher mean scores of these household members in these activities they were more involved. However, children did not dominate in any activity of rice production.

4. CONCLUSION

Farmers involved in rice production in the area were young females who were also literate with moderate household size. They grew local variety of rice which may have resulted to low yield and poverty among these farmers. There were significant differences in roles played by each member of the household in most of the activities involved in rice production with youths anchoring most of these roles.

5. RECOMMENDATIONS

- Researchers that develop technologies related to rice should target specific members of household that dominate in specific activities in generating technologies related to them. Agricultural extension should also take cognizance of these intra-household roles in selecting clients or target beneficiaries for a particular innovation such that innovation related to particular task in rice production should be directed to household members that do the task.
- Thus there is need for government to enact favourable policies and programmes that will aim at making agriculture attractive and lucrative. This will attract and deploy youths in rice/agricultural production, stimulate and sustain growth and development in the sector and economy at large.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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