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Acceptability of improved crop production practices among rural women in Aguata agricultural zone of Anambra State, Nigeria

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The acceptance of improved crop production practices by rural women in Aguata Agricultural Zone of Anambra State, Nigeria was examined in this paper. The objectives of the study include identification of the available improved crop production practices, determination of the women's adoption level, identification of problems that limit the rural women's acceptability of improved crop production practices, and to ascertain the relationship between the socio-economic characteristics of the women and their decision to adopt. Structured questionnaire was administered to one hundred randomly sampled women from twenty communities in five local government areas. Data analysis was by the use of frequency distribution, percentages, mean and multiple regression technique. It was observed that the respondents adopted ten out of twelve selected improved practices. The study revealed significant relationship between adoption and the following variable, household size (t-value = 4.419), number of farms owned (t-value = 2.391) farming experience (t-value = 2.938) and extension contact (t-value = 3.034). It is recommended that rural women should be encouraged through access to appropriate inputs, land, credit facilities and policy promotion for increased and effective agricultural productivity.

Key words: Adoption, improved cassava technology, rural women.

INTRODUCTION

A rapidly changing world with high population growth rates and major changes in political and economic systems has created an urgent need to develop new and revise/improve many existing agricultural systems. Rapidly increasing population pressures overwhelmed traditional farming systems and farm holding are no longer large enough to support the growing systems and growing number of people in household (CTA, 2000). Improved crop production practices geared towards achieving sustained and efficient food production and as well increased income which enable the farmer to meet up with the growing number of people in the household. The mainstay of Nigerian economy is agriculture which at the same time is a major source of income (Mathews-Njoku, 2004). Hence, a farmer who farms as his fore-fathers' cannot produce enough food for more than a family of five, even if he works very hard. Whereas, the one who adopts modern/improved crop production packages can produce ample food for as many as thousands of people. Farming based entirely upon traditional agriculture has low economic returns. A nation which is dependent upon traditional agriculture is inevitably poor; as a result it spends much of its income on food (Okoye, 1989).

Rural development involves strategies designed to improve the economic and social life of the rural area. An important objective of rural development is to increase agricultural productivity with a view to enhancing farmer's income and standard of living. Improved practices provide the main venue for increasing productivity in the country's agriculture. In fact rural development can be promoted through stimulating the adoption of new/ improved agricultural practices. Consequently, the survey specifically concern rural women and their decision to adopt/accept improved crop practices, which if they show positive attitude towards, will help boost their farming practices.

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Women play an indispensable role in farming and improving the quality of life in rural areas. Over 80 percent of women in Nigeria provide 60-80 percent of all agricultural labour (Mahmood, 2001). According to Ukpongson and Mathews-Njoku (2002), women form the backbone of rural development. Accordingly, women represent a major force to rural change, a largely untapped resource that could boost rural economy, higher growth rate and increased food production (Matthews-Njoku and Adesope, 2003). Contributions of rural women to agricultural production is overwhelming and cannot be overemphasized. Thus, considerable attention has been given in recent years to the fact that a large proportion of agricultural work in any country is done by women (Van den Ban and Hawkins, 1988). Over the years reports across different societies of the world including those of Nigeria clearly gave credence to the productive capability of women in national development in relation to their men folks. Women actually constitute the bulk of the world's food producers by predominating the agricultural sector in terms of numbers and tasks performed. Research reports have confirmed that women all over the world are taking giant strides in agricultural activities. For instance, Kisekka (1981) reported that in Nigeria 60 - 80% of the agricultural workers are women. Also, FAO (1985) stated that women contribute 71 percent of the time devoted to subsistence activities in developing countries. Further, Blackwood (1988) noted that an estimated 50 percent of man hour input in sub-Saharan African agriculture is provided by women. Eboh (1988) is of the view that despite women's major responsibility in household, health and nutrition, their role in agriculture covers all facets of agro-business, including food production, livestock production, fishing and as well as farm management.

Morna (1992) noted that, if men and women share agricultural load, women bear the greater burden taking into account the respective contributions of men and women together as husbands and wives. It was further asserted that the work load of rural women is compounded by their multiple roles as farmers, traders, income earners, mothers, family caretakers, water carrier, fuel gatherers, food processors and others. On the basis of this, FEM consult (1990) concluded that everywhere, women's work load is greater than men's as a result of their multiple roles. Again, FAO (1985) observed that in Nigeria, about 45 percent of rural population is made up of women farmers. In effect, women are the backbone on work force of development and agricultural production. Hence, considering the women's workload, Matthews-Njoku (2004) observed that when a task done by women is made easier by technological improvement, then men have a tendency to taking over for economic benefits. Thus, most men are profit orientated and not job oriented. Women need to be empowered and encouraged towards the need to accept improved crop production practices in order to make their task easier, ensure a sustained and efficient production of food, enhance economic development and as well boost agricultural production which ensures agricultural development. It is against this background therefore, that this study is focused on the dominant work force in Nigerian's agriculture, 'women', to verify their response to improved crop production practices in Aguata Agricultural zone, Anambra State, Nigeria.

The acceptance of improved crop production practices in any locality at any given time is as a result of the interaction of various factors, including certain personal characteristics (Okoye, 1989). Women play an indispensable role in farming and in improving the quality of life in rural areas. However, their contributions often remain concealed due to some social barriers and gender bias. Even government programs often fail to focus on women in Agriculture (RWFSAC, 2003). There are some constraints facing the rural women's adoption of improved crop production practices which include, failure of extension workers to reach them, lack of incentive to increase productivity, limited access to credit inputs, lack of access to relevant technological information and improved agricultural practices, and lack of access to membership in cooperatives and other rural organizations. Experience has shown that some women because of their habit and apathy are resistant to change, that is, they cannot agree to accept any improved crop production practices which may definitely change or affect their farming system. It is against this background therefore, that this study examines women's decision to accept/ adopt improved crop production practices.

The main objective of the study is to determine factors influencing women's decision to adopt/accept improved crop production practices and to identify variables which interact to influence their adoption behavior in Aguata agricultural zone, of Anambra State, Nigeria. Specifically, the study has its objectives as follows: identify the available improved crop production practices, determine the level of the women's adoption of the improved crop practices, identify problems that limit the rural women's acceptability of improved crop production practices, and ascertain the relationship between the socio-economic characteristics of the women and their decision to adopt. The hypothesis was stated thus: There is no significant relationship between socio-economic characteristic of rural women and their decision to adopt improved crop production practices.

METHODOLOGY

This study was carried out in Aguata Agricultural Zone of Anambra State. The target population was the rural women in Aguata Agricultural Zone. There are four agricultural zones in Anambra state from which Aguata agricultural zone was taken as a case study. Five local government areas in the zone were covered. They include Augata, Orumba South, Orumba north, Nnewi south and Nnewi North. From each of the local government, four communities where randomly selected and a random sampling of five women were selected from each of the community to give a total of one hundred respondents. Structured questionnaire was designed and administered to the respondents through the extension agents. The sampling method used in this study is the multi-stage random sampling.

Measurement of variables

The variables of the study were measured as follows: The dependent variable was adoption/acceptance.

Adoption/acceptance:

This was measured by the level of adoption. The level of adoption was measured on a 3 –point scale of; fully adopted (2), partially adopted (1) and not adopted (0) of the improved crop production practices.

Availability of crop production practices

These were measured in a 4-point scale of very much available (3), moderately available (2) less available (1), not available (0).

Marital status: This was measured as single (0) and married (1).

Age: This was measured as the actual age of respondent (in years).

Education: This was measured by the highest educational level attained and also whether attended any formal school.

Household size: This was measured by actual number of members of the household.

Number of farms owned: Number of farms was measured as the actual number of farms owned.

Farmer status: This was measured as full time and part time.

Farming experience: This was measured by the number of years they have been engaged in farming.

Extension contact: This was measured by the number of times the extension agents have reached the farmers per week.

Model specification

$Y = f (X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8 , e)$

Where Y = index of adoption (pooled adoption scores), X_1 = marital status (single = 0, married = 1), X_2 = age (years), X_3 = level of education (no formal education = 0, primary education = 1, secondary education = 2, higher education = 3), X_4 = household size (actual number of household), X_5 = number of farms owned (actual number of farms owned by the farmer), X_6 = farmer status (full time = 0, part time = 1), X_7 = Farming experience (years), and X_8 = extension contact (per week)

Data collection

Data used were collected from two sources: Primary Data which consisted of a structured questionnaire was designed and used for data collection as the primary data source. Secondary Data Source included relevant materials (books), journals of agriculture, forestry and sciences and media materials.

Data analysis

Data collected were analyzed using descriptive statistical tools such as percentages, frequency distribution and mean scores. Inferential statistic used was multiple regression analysis to test the hypothesis. The multiple regression analysis was used to determine the significant relationships between socio-economic characteristics of rural women and their decision to adopt improved crop production practices.

RESULTS AND DISCUSSION

Availability of improved crop production practices

Table 1 shows the availability of improved crop production practices. For adequate crop spacing, 89 percent of the respondents indicated that the technology is available while 11 percent indicated that it is not available; the mean score of 2.58 confirms availability of adequate crop spacing. Optimum plant population is available as 89 percent of the respondents affirmed its availability and 11 percent indicated that it is not available but the mean score of 2.44 also confirms that it is available. Seed dressing as an improved crop production practice is available since 85 percent said it is available; seed dressing is confirmed available by mean score of 2.27. Use of herbicides is confirmed not available since it has the mean mark of 1.37. Use of fertilizer is affirmed available by 81 percent of the respondents and 19 percent indicated that it is not available, the mean score 2.29 suggests its availability. Use of insecticide is identified available by 52 percent of the respondents and not available by 48 percent.

Regular weeding is indicated available by 94 percent of the respondents while 6 percent indicated it not available. The mean score of 2.75 affirms its availability. Adequate disease control was indicated available by 64 percent of the respondents, and 36 percent indicated that it is not available. 1.88 mean score confirms that adequate disease control measure is available. Timeliness of planting is observed available by 82 percent of the respondents and not available by 18 percent and the mean score of 2.47 confirms its availability. Yam minisett technology is an available technology as affirmed by 86 percent of the respondents and 14 percent identified it not available; the mean score of 2.45 proves its availability. Improved maize varieties are indicated available by 80 percent of the respondents and not available by 20 percent and the mean score of 222 confirms that improved maize varieties are available. Improved cassava varieties are identified available by 82 percent and mean score of 2.28 affirms its availability. Dry season vegetables as a technology is seen available by 75 percent of the respondents and not available by 25 percent and the mean score of 1.88 confirms the technology available.

Adoption Level

Table 2 shows the responses on adoption of selected

Table 1. Frequency distribution according to availability of improved crop production practices.

Improved crop production practices	VMA	MA	LA	NA	Mean	Remarks
Adequate crop spacing	70 (70)	19 (19)	10 (10)	1 (1)	2.58	Available
Optimum plant population	58 (58)	31 (31)	8 (8)	3 (3)	2.44	Available
Seed dressing	47 (47)	38 (38)	10 (10)	5 (5)	2.27	Available
Use of herbicides	14 (14)	29 (29)	37 (37)	20 (20)	1.37	Less available
Use of fertilizer	48 (48)	33 (33)	19 (19)	-	2.29	Available
Use of insecticides	16 (16)	36 (36)	31 (31)	17 (17)	1.51	Available
Regular weeding	81 (81)	13 (13)	6 (6)	-	2.75	Available
Adequate disease control measures	25 (25)	39 (39)	35 (35)	1 (1)	1.88	Available
Timeliness of planting	68 (68)	14 (14)	15 (15)	3 (3)	2.47	available
Yam minisett technology	62 (62)	24 (24)	11 (11)	3 (3)	2.45	Available
Improved maize varieties	42 (42)	38 (38)	20 (20)	-	2.22	Available
Improved cassava varieties	45 (45)	37 (37)	16 (16)	2 (2)	2.28	Available
Dry season vegetables	26 (26)	49 (49)	12 (12)	13 (13)	1.88	Available

Figures in parentheses are percentage. The mid point for this frequency table is 1.50. As a decision rule, any mean score that is ≤ 1.50 = less available; > 1.50 = available.
VMA = Very much available; VA = moderately available; LA = less available; NA = not available.

Table 2. Frequency distribution according to the level of adoption of improved crop production practices.

Improved crop production practices	Fully adopted	Partially adopted	Not adopted	Mean	Remarks
Adequate crop spacing	66 (66)	33 (33)	1 (1)	1.65	Adopted
Optimum plant population	52 (52)	45 (45)	3 (3)	1.49	Adopted
Seed dressing	66 (66)	24 (24)	10 (10)	1.56	Adopted
Use of herbicides	20 (20)	43 (43)	37 (37)	0.83	Partially adopted
Use of fertilizer	65 (65)	28 (28)	7 (7)	1.58	Adopted
Use of insecticides	22 (22)	55 (55)	23 (23)	0.99	Partially adopted
Regular weeding	84 (84)	15 (15)	1 (1)	1.83	Adopted
Adequate disease control measures	35 (35)	55 (55)	10 (10)	1.25	Adopted
Timeliness of planting	77 (77)	15 (15)	8 (8)	1.69	Adopted
Yam minisett technology	71 (71)	28 (28)	1 (1)	1.70	Adopted
Improved cassava varieties	60 (60)	36 (36)	4 (4)	1.56	Adopted
Dry season vegetables	37 (37)	50 (50)	13 (13)	1.24	Adopted

Figures in parentheses are percentage. The mid point of this frequency table is 1.00. As a decision rule, any mean score that is ≤ 1.00 = partially adopted and any that is > 1.00 adopted.

improved crop production practices by the rural women of Aguata agricultural zone. The adoption of the improved crop production practices by the rural women was varied. Whereas 66 percent of the respondents indicated full adoption of adequate crop spacing technology, 33 percent indicated partially while 1 percent indicated no adoption. The mean score of 1.65 suggests that adequate crop spacing is adopted by the rural women. Optimum plant population is fully adopted by 52 percent of the respondents, 45 percent partially adopted and 3 percent not adopted, the mean score 1.49 confirms that optimum plant population is adopted by the respondents.

Seed dressing is adopted by 66 percent of the respondents, partially adopted by 24 percent of the respondents and not adopted by 10 percent of the respondents; the mean score of 1.56 affirms its adoption by the respondents. Use of fertilizer is fully adopted by 65 respondents, partially adopted by 28 respondents and 7 respondents did not adopt. The mean score of 1.58 shows that use of fertilizer (organic) is adopted. Use of herbicides and insecticides were partially adopted. The reason might be the fear of poisoning plants and human or as a result of the cost of securing the chemicals. Conversely, regular weeding was fully adopted by 84 percent and not adopted by 1 percent of the respondents; the mean score of 1.83 confirmed adoption of regular weeding practice.

Adequate disease control measures was fully adopted by 35 percent of the respondents, partially adopted by 55 percent and not adopted by 10 percent of the respon-

Table 3. Frequency distribution according to the problems that hinder adoption.

Problems	VS	MS	LS	NS	Mean	Remarks
Inadequate medium as a source of information	24 (24)	60 (60)	11 (11)	5 (5)	2.03	Serious
No technical advice for proper application and use of technologies	22 (22)	61 (61)	7 (7)	10 (10)	1.95	Serious
Low level of income	84 (84)	15 (15)	1 (1)	-	2.83	Serious
Lack of access to appropriate	60 (60)	33 (33)	6 (6)	1 (1)	2.52	Serious
Lack of access to land	51 (51)	30 (30)	7 (7)	12 (12)	2.20	Serious
No access to credit facilities	74 (74)	16 (16)	8 (8)	2 (2)	2.62	Serious
Fear and suspicion	12 (12)	52 (52)	10 (10)	26 (26)	1.50	Less serious

Figures in parentheses are percentage. The mid point for this frequency table is 1.50. As a decision rule, any mean score that is ≤ 1.50 = less serious and that > 1.50 serious.
VS = Very serious; MS = moderately serious; LS = less serious; NS = not serious.

dents and the mean score of 1.25 suggests adoption of the technology by the respondents. Timeliness of planting was fully adopted by 77 percent of the respondent, 15 percent partially adopted and 8 percent not adopted; the mean score of 1.69 shows adoption. According to Nnadi (2005), "timeliness of planting is usually a function of earliness or lateness of the rain". Since rural agriculture is rain-fed, the rural women respond immediately at the start of rain. Yam minisett technology is fully adopted by 71 percent of the respondents, partially adopted by 28 percent and not adopted by 1 percent of the respondent; the mean score of 1.70 confirms adoption of yam minisett technology by the rural women. Improved cassava varieties were fully adopted by 60 percent of the respondents, partially adopted by 36 percent and not adopted by 4 percent of the respondent and the 1.56 mean score affirms adoption of improved cassava varieties by the respondents. Dry season vegetables is fully adopted by 37 percent of the respondents, partially adopted by 50 percent and not adopted by 13 percent of the respondents; the mean score of 1.24 suggests the adoption of dry season vegetables as a technology by rural women.

Problems that hinder adoption of improved crop production practices

Table 3 shows the seriousness of problems that hinder adoption of improved crop production practices. Where 84 percent of the respondents indicate inadequate medium as a source of information a serious problem, whereas 16 percent indicating it not a serious problem (mean = 2.03). By implication, inadequate medium as a means of information is a serious problem that hinders respondents' adoption of technologies. The importance of communication in development context cannot be overemphasized. For instance, Kashem (2006) observed that extension communication can play a very important role in the overall disaster management. The present study found that lack of technical advice for proper application and use of improved crop production practices was also identified as a serious problem of adoption since 82 percent of the respondents confirm it and 18 percent said is not a serious problem (mean = 1.95). This finding obviously confirms Dimelu and Saingbe (2006) who stated that adoption and utilization of appropriate agricultural technology by rural farmers is largely dependent on the relevance and effectiveness of information dissemination and the ability of the agents to persuade the farmers. Low level of income is suggested a serious problem by 99 percent of the respondents and only 1 percent said is not a serious problem, taking the mean score to be 2.83. Low level of income is a serious problem hindering the rural women's adoption of the improved practices. Consequently some innovations are very expensive that these rural women cannot afford to get them and thus may not be able to use them. Lack of access to appropriate farm input is a serious problem as confirmed by 93 percent of the respondents while 7 percent suggest it no serious problem (mean = 2.52). This implies that lack of access to appropriate farm input is a serious problem. Likewise lack of access to land is indicated a serious problem by 81 percent of the respondent and 19 percent affirms that it is not a serious problem (mean = 2.20).

No access to credit facilities is indicated a serious problem by 90 percent of the respondent while 10 percent indicate that it is no serious problem (mean = 2.62). This implies that no access to credit facilities is a serious problem hindering adoption of improved crop practices by the rural women. Fear and suspicion was identified less serious problem since the mean score is 1.50.

Regression analysis

Four functional forms were tried to determine the relationship between adoption and socio-economic characteristics of rural women. These include linear, semi-log, double-log and exponential forms.

Table 4 shows the relationship between the socio-economic characteristics of rural women of Aguata agri-

Table 4. Relationship between adoption and socio-economic characteristics of rural women.

Functional forms	Constant	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	R^2	f-value
Linear	4.088	-0.426	0.911	-1.995E-02	1.537	0.790	-0.821	1.571	2.379	0.447	9.184
	(1.029)	(-0.494)	(1.911)	(-0.050)	(4.419)*	(2.391)*	(-0.932)	(2.938)*	(3.034)*		
Double log	0.977	-6.335E-02	0.128	1.189E-02	0.279	8.792E-02	-0.117	0.97	0.257	0.363	6.477
	(12.210)	(-0.063)	(2.001)	(0.209)	(4.597)*	(1.842)	(-1.284)	(1.923)	(1.664)		
Semi log	8.710	-1.736	5.082	0.274	9.906	2.739	-4.813	6.664	9.594	0.417	8.124
	(3.349)	(-0.586)	(2.449)*	(0.148)	(5.025)*	(1.764)	(-1.617)	(2.003)	(1.912)		
Experimental	0.835	-1.521E -02	2.277E-02	2.761E-03	5.554E-02	1.780E-2	-2.285E-02	3.974E-02	6.573E-02	0.366	6.564
	(6.363)	(-0.557)	(1.519)	(0.221)	(4.487)*	(1.749)	(10.818)	(2.374)*	(1.424)		

Figures in first rows are regression coefficient (b).
Figures in parenthesis are t- values.
*Significant at 0.05 level (5%).

cultural zone, Anambra state, Nigeria and their adoption of improved crop production practices. The linear function had the highest coefficient of multiple determinations (R^2) with 0447 and F-value of 9.184. The number of significant variables (4) was also the highest. Hence, linear function was identified as lead equation and used for further discussion.

The result shows that household size, number of farms owned, farmer experience and extension contact were significant at 0.05 levels. Thus, the hypothesis is therefore rejected since there was significance relationship between the farmer's socio-economic characteristics and adoption of improved crop production practices. The coefficient of household size (x_4) was significant and positively related to rural women's adoption of improved crop production practices (t-value = 4.419). This implies that the more hands to help in the household, the more they adopt. This is in consonance with Nnadi (2005) who observed that rural women with more people in their household invariably had more mouths to feed in order to meet up with the exigencies of household food security adopt more. A positive relationship was obtained between number of farms owned and adoption (t-value = 2.391). This implies that respondents with larger farm holdings adopt more. This is in agreement with our previous observation (Matthews-Njoku, 2003) and also in confirmation with findings of Nkonya et al. (1997) suggesting that farmers who had large farms are likely to adopt those innovations and technologies which will enhance and make their production practices effective resulting in higher yield. Farming experience correlated positively and significantly with adoption of improved crop production practices. Thus, as the farmer acquire longer experiences, so he acquires diverse ways of farming.

There is a positive significant between extension contact and the adoption of improved crop production practices by the rural women with t-value of 3.034. This suggests that the more the extension contact with the farmers, the more information on the improved crop production practices. Hence, these women are likely to adopt more. The more visit by the extension agents to the farmers, the more aware they become of the improved practices and the more they adopt. This agrees with the findings of Nnadi and Akwiwu (2005).

Conclusion and recommendations

Greater attention needs to be given to the activities of rural women to encourage, equip and assist them overcome obstacles and expand their productivity. The availability of improved crop production practices obviously influenced the adoption as was observed in this study. The intensity of adoption was however, determined by household size, number of farms owned, farming experience and extension contact. It is therefore concluded that rural women are still significant stakeholders in the agricultural sector in Nigeria. It is therefore recommended that regular visit by extension agents to farmers should be encouraged to further improve their awareness and

make more improved practices available. Rural women should be equipped with adequate agricultural inputs needed for efficient agricultural production.

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