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Constraints to the Adoption of New Technologies by Small-Scale Farmers in Delta State, Nigeria.

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ABSTRACT - The constraints to adoption of new technologies by small-scale Farmers in Delta State, Nigeria was considered by the study. Findings showed that level of education, tenancy, farming type, Extension Agents availability and social status showed significant level of constraints on adoption of new technologies. It was recommended that the farming constraints should be tackled by the relevant agencies that can appropriately handle each of the classified constraints.

KEY WORDS: Constraints, Technologies, Small – Scale Farmers

INTRODUCTION

The issue of technological information and adoption is of paramount importance to increasing food production in Nigeria. Like some other African countries, 80% of Nigeria's total food production come from the rural areas. Also, 60% of her population earns its living from small farms (Olayemi, 1980). Farmers require up-to-date knowledge on farming, brought about through findings from research activities. According to Okereke (1985), if development, especially in agricultural sector, is to take place and become self-sustaining, it has to begin with the rural areas. Also, Ojo (1991) asserted that, there can be no doubt that the ultimate transformation of the small-

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scale sector will depend largely on technological change arising from research efforts.

Research in Nigeria has however been criticized as been very ineffective (Olayide 1981, Idachaba 1980) because of its under funding. Ojo (1991) linked the under funding with the viability to acquire relevant research materials and equipment. According to Okereke (1985), not much of research is done on the rural farmers' environment, psychology and socio-economic behaviour. He also stressed on the ineffective research - production sectors linkage whereby extension service obtains little or no back- up information from research institutes in terms of new technologies. Ojo(1991) sees the absence of a strong link between agricultural research and extension in Nigeria as a major constraints on food production while Eleagu (1986) refers to inadequate manpower as a critical factor for agricultural development. The authors (Ojo 1991 and Eleagu 1986) confirmed that the present Extension worker - Farmer ratio of 1:2000 - 5000 is a bottle-neck to adoption of innovations.

However, most of the problems advanced for the poor performance of research and extension in developing and transferring new technologies according to Okereke (1985) are exogenous while some are endogenous. It is against this backdrop that this study sought to identify what constraints affect the adoption of new technologies by the small-scale farmers in the study area. The study also sought to determin the socio-economic characteristics of the farmers and the level of the constraints on the level of adoption of new technologies.

METHODOLOGY

The study was carried out in Bomadi Local Government Area of Delta State. The Local Government Area was purposively selected because it is one of the LGAs where the greatest quantity of cassava, yam, maize and fishing are produced by small-scale farmers (Idachaba 1981, Ojo 1991). Stratified random sampling technique was used to select respondents from the six communities that make up the Local Government Area. In all, 100 structured questionnaires with close and open-ended questions were administered to a list of farmers provided by the ADP although 80 copies were retrieved for the analysis.

RESULTS AND DISCUSSION

(i) Personal characteristics of respondents

Personal characteristics of the respondents included sex, age distribution, marital status, level of education and social status.

TABLE 1: Personal characteristics of respondents

SEX	FREQUENCY	PERCENTGE
Male	16	20.0
Female	64	80.0
Total	80	100.0
AGE (Years)		
<25	4	5.0
26 - 35	8	10.0
36 - 45	17	21.0
46 - 55	28	35.0
56 - 65	14	17.5
>65	9	11.3
Total	80	100.0
MARITAL STATUS		
Single	14	17.5
Married	52	65
Widow	10	12.5
Divorced	4	5.0
Total	80	100.0
Level of education		
No formal education	15	18.8
Primary education	22	27.5
Secondary education	34	42.5
Tertiary education	9	11.2
Total	80	100.0
SOCIAL STATUS		
Ordinary citizen	35	45.4
Family Head	20	26.0
Village Head	11	14.3
Traditional/Religious Chief	11	14.3
Total	27	100

Source: Field Survey, 2000

According to Table 1, it was found that female farmers constituted a larger percentage (80.0) of the farming populace. This finding diversified from most previous findings where males are usually the majority. This diverse may not be divorced from variations in cultural background among Nigerian populace. Sex may not however be an inhibiting factor to accessibility to information, especially, from interaction with extension personnel, contrary to what is prevalent in the Northern part of Nigeria, where the religion in practice forbids interaction between two unmarried opposite sexes. However, timing for extension meetings may be a constraint since other roles and responsibilities deserve time-consciousness. Also apprehensive of, is accessibility to land and credit.

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Findings also show that the average age of the respondents were between 46 and 55 years old. The respondents could be referred to as middle aged, since 56.2 percent fell between 36 and 55 years old. At this age, less ruggedness in ruralites is observable and so less farming activities was expected. This majority's age bracket is also an indication of the marital status, as one is expected to have gotten married before the age bracket. This was confirmed by the result 65.0 percent of the respondents that were married. Married status confers additional responsibility to the respondents, since the household must be fed and children must be nursed. This may therefore constraints for larger farm size, search for credit and technologies and generally, improvement in strategies.

The result further shows that only 18.8 percent of the respondents had no formal education while 81.2 percent had one level of education or the other. This finding, indicates that, there would likely be high level of awareness by the farmers on development and farming improvement strategies, because, the respondents were expected to be able to garner enough information from the varying media. This agrees with previous studies (Voh, 1979, Monu, 1980, Bhowmik, 1978) who found a significant relationship between level of education and level of adoption of innovation and this according to Williams (1984) could result in increase in farm production. Large farm production was therefore expected among the respondents.

Furthermore, the result of the study shows that 45.4 percent of the respondents were ordinary citizens while 54.6 percent were not, as they were either family heads, village heads or traditional / religious chiefs. The non-ordinary citizens have therefore, enhanced statuses, which make them respectable within and outside the community they belong. This category is usually the innovators or early adopters. Extension personnel has more direct dealing with them than the other category (ordinary citizens) and is usually used as the legitimiser and /or as contact farmers.

(ii) Respondents Farming Activities**Table 2. Respondents' Farming Activities**

Farm size	Frequency	Percentage
Less than 5.99ha	55	68.7
6.00-9.99	17	21.3
10 and above	8	10.0
Total	80	100.0
Farming Type		
Crop production only	70	87.5
Mixed	10	12.5
Total	80	100.0
Tenancy		
Land owner	64	80
Non-landowner	16	20
Total	80	100.0
Level of Adoption		
Never adopted	47	58.7
Occasional	20	25.0
Always	13	16.3
Total	80	100.0

It was found that 68.7 percent of the respondents had less than 6 hectares of farm size, 21.3 had between 6.0 and 9.99 hectares while 10 percent had up to 10 and more hectares (Table 2). According to Olayide (1980), Farm size less than 6 hectares is referred to as small farm while between 6 and 9.99 and 10 and above are referred to as medium and large farms respectively. Based upon this classification therefore, the majority of the respondents could be said to be small farmers. Small-scale farming had been known (Williams 1984) to be a constraint to adoption of innovation and search for credit facilities. This is because such farmers become risk averse and lack collateral for access to credit.

It was further found that 87.5 percent and 12.5 percent of the respondents grew crops only and practised mixed farming respectively. This result has an indication that majority of the respondents were more likely to seek for technologies that support crop production. Therefore, more emphasis needs to be placed on those technologies that are relevant to crop production in the study area.

Eighty percent of the respondents was found to own their lands while 20 percent were tenants. Tenancy may not therefore be a major constraint to adoption of innovation in the study area. This is because, where farmers are tenants on their farm, they might not be able to grow their desired crops and

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it does result in poor improvement on farm land. In some circumstances, such farms are fragmented, thereby, ruling out the use of mechanization.

Again, the result shows that 58.7 percent of the respondents had never adopted innovation, 25.0 percent did occasionally while only 16.3 percent adopted consistently. These figures indicated that 83.7 percent were not effective (never adopted or adopted occasionally). Therefore, level of adoption was very low among the respondents and could be regarded as a major constraint to production among the respondents.

(iii) Perceived Constraints to Adoption

Why farmers did not adopt innovations in the study area has been hinged on some perceived constraints as contained in Table 3.

Table 3: Perceived Constraints to Adoption of Information by the Respondents

Constraints	Frequency	Percentage	Rank
Lack of input	13	53.8	1st
Lack of Infrastructures	14	17.5	2nd
Lack of Storage/Processing Equipment	7	8.7	3rd
Lack of Credits	7	8.7	3rd
Unavailability of Market	5	6.3	5th
Tenancy Problem	4	5.0	6th
Total	80	100.0	

Source: Field Survey, 2000

Table 3 shows the ranking of the perceived constraints. Clearly, lack of inputs, lack of infrastructures and processing facilities, and lack of credits have the greatest effect on adoption respectively.

The duo of farm inputs and credits had earlier been found to have the greatest influence on adoption of soybean cultivation practices (Okunloia et al 1998). This result was further buttressed by Obeta (1997) who opined that adoption of innovation depends on the availability and use of more production inputs when innovations are introduced to farmers without the necessary farm inputs to back them up, adoption would likely fail. Hence the more readily farm inputs and credits are available and accessible, the more influence they have on adoption.

Also listed as perceived constraints to adoption, are unavailability of markets and tenancy which were ranked 5th and 6th respectively. The position of tenancy in the rear can be associated with large percentage of the respondents who own their own land.

(iv) **Effects of some Socio-Economic Factors and Farming Activities on Adoption**

Using Chi-square for analysis, some socio-economic factors and farming activities were tested with level and number of perceive constraints to adoption. The factors considered included socio status, farming type, extension agent availability, level of education and tenancy.

Table 4: Chi-square Analysis on Effect of Constraints on Socio-Economic and Farming Activities

Variables	X ² cal	X ² Tab	DF	Remark
Level of Education and Level of Constraints	93.32	12.59	6	S
Tenancy and Level of Constraints	61.67	5.99	2	S
Type of Farming and Level of Constraints	72.16	11.07	5	S
Extension Agents Availability and Level of Constraints	64.4	11.07	5	S
Social Status and number of constraints	148.4	81.41	20	S
Number of Constraints and Level of adoption	121.9	18.31	10	S

Source: Field Survey, 2000

From Table 4, at 5 percent level of significance. It was found that level of education, tenancy, type of farming and extension agent availability all have significant association with level of constraints. That is, the level of constraints as perceived by the respondents has relationship with the described variables. Also, social status and level of adoption have significant relationship with level of constraints.

The implication of the findings is that, the higher the level of education of the respondents the more he will likely be able to perceive the constraints inhibiting his level of production, however, the more easily too the respondent will likely be able to seek for solutions to the constraints. This might be because the more educated farmers become, the more innovative they tend to become in the farming techniques.

The significant relationship between tenancy and level of constraints might be because, farmers who own their land are more likely to be posed with less number of constraints than the one who does not. For instance, a tenant farmer is more likely to be faced with constraints of land degradation, inability to plant perennial crops, uncertainty of tenure of land, collateral problem for credit and lack of farm input resulting from land fragmentation.

Also, where extension agents are readily available, assistance to farmers, and creation of awareness on new technologies would be more profound than where the contrary is prevalent. Hence, the perceived constraints can receive quick solution. That might have been responsible for the significant relationship that existed between extension agent availability and level of constraints.

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Furthermore, the result shows that a significant relationship existed between social status and number of constraints. Farmers with enhanced social status are sometimes used by extension personnel as contact farmers to other farmers, they are also known to be innovators and early adopters (Williams 1984). Farmers of higher social status are more likely to have access to inputs than their counterparts. As a result of this privileged stand point, farmers who are higher in social status would likely have lesser constraints than those of lower social status.

Finally, it was found that, number of constraint has significant relationship with level of adoption. It implies that the higher the number of constraints the lesser the farmer would be able to adopt. Even in a circumstance where the farmer has the urge to adopt, the limiting factors would be the many constraints which may include the inability to secure credits. Therefore, where a farmer has less number of constraints to contend with, a favourable psychological and socio-economic environment for adoption became ascertained.

CONCLUSION

The study has revealed that, farmers were faced with a lot of constraints which put a limitation on the productivity of the farmers' efforts by inhibiting their level of adoption of technologies. These constraints largely emanate from inappropriately executed government policies and financial handicap. Moreover, with a large percentage of farmers on the aged side, less of efforts of the young and virile labour force prevails, hence less enthused for adoption.

In addition, the study has shown that a large percentage of farmers had one level of education or the other and the farmers were therefore in a position to better innovatively combat the constraints they are faced with. However the farmers are small-scaled and that may not offer the enough ability to adopt and to overcome the constraints.

It therefore behooves that those constraints that are administrative should be addresses by the organs and agencies whose duties are to alleviate the limitation to the farmers' level of production. While those constraints that are financial should be combated through giving assistance to farmers to form effective co-operative associations for the purpose of funding their farming activities. When these are put in place, an atmosphere that are technology friendly would have been created, hence, increase in the level of adoption.

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