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Evaluation of Farmers' Participation in Farming Systems Research in Cross River State, Nigeria

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ABSTRACT

Farming Systems Research and Extension (FSRE) has been acknowledged as a veritable approach to technology generation, adapting such technologies to farmers' social, economic and physical environments, taking into consideration their production constraints. The study was, therefore, conducted to find out the extent of participation of farmers in Farming Systems Research and Extension activities, with particular reference to OFAR (On-Farm Adaptive Research). In conducting the study, 180 farmers participating in extension programmed in the state were randomly selected using the multi-stage random sampling technique. The data collected through a structured questionnaire were analyzed using the t-test of significance of difference between sample and population mean. The study found that farmers were unanimous that they participated effectively in OFAR as the study found no significant difference between population and sample means. Hence, the null hypothesis that no significant difference existed between the sample and population means regarding farmers' participation in OFAR was accepted, while the alternative hypothesis rejected at 0.05 ($p \leq 0.05$) level of significance and 179 degrees of freedom

Keywords: Evaluation, farmers, participation, farming, systems, adaptive, research.

INTRODUCTION

Farming Systems Research and Extension (FSR & E) approaches were developed as agricultural researchers sought to overcome the shortcomings inherent in traditional, pure commodity or disciplinary research methods, which lacked proper understanding of farmers' circumstances and socio-economic environment (Dilton and Anderson, 1984). While farming systems research focuses on technology generation in cooperation with farmers, the Training and Visit extension system (T and V) focuses on pushing down technologies generated upstream without farmers' input for adoption. The top-down bureaucratic approach of the T and V has been criticized as being considerably responsible for poor adoption.

Farming Systems Research and Extension approach concentrates on the farmers' conditions, especially their constraints and expectations, and integrate farmers into research and development process. Farming Systems Research and Extension is essentially a farmer-oriented problem-solving approach to agricultural research and extension based on the appreciation of farmers' production systems, their household interactions and environmental variables, viz: agro-ecological, sociological, cultural, economic and political constraints/opportunities, which influence the farmers' decision-making process. It is an approach to agricultural research and development, which views the farm historically. Consequently, it focuses on the interdependencies among the various components controllable by the farm household and how these components interact with the physical, biological and socio-economic factors outside the households' control (Unamma, Onwudike, Uwaegbute, Edeoga and Nwosu, 2004).

According Anderson and Hardaker cited in Amalu (1998), Farming Systems Research and Extension has the following attributes:

- A problem-solving orientation
- A holistic outlook and approach
- A multidisciplinary basis involving the coordinated use of base data, surveys, modeling, laboratory investigation and on farm trials
- Being focused on the problems of identified and relatively homogenous of group of farmers
- Being based on farmers' participation, with emphasis on bottom-top communication, and recognition of the farmer as the key element of the farming system
- Ensuring effective upstream and downstream links with researchers, extension staff and the farmer;
- Following a dynamic action-oriented and adaptive approach, enabling tentative solutions to be tested and modified, redesigned or rejected on the basis of accumulated experiences and feedback from farmers; and
- Being an assemblage to the extent which it leads to the development of cost effective and improved farming systems that are readily adopted by its clientele, the farmers.

Commenting on research and extension in enhancing adoption, IFAD (2001) observed that the prevalent model of agricultural development aid today continues to be technology transfer from scientific researches to farmers through extension. The model rests on two assumptions: Participatory methodologies and approaches to technology generation and adaptive trials are acknowledged as not only ensuring that technological innovations are environmentally friendly, socially desirable, economically affordable but also sustainable. Moreover, participatory research ensures very high adoption of technologies that developed. The participatory research methodologies/technique emphasized by the Cross River Agricultural Development Programme (CRADP) viz-a-vizFarming Systems Research and Extension (FSRE) are On-Farm Adaptive Research (OFAR), On Farm Adaptive Trials (OFAT) and Small Plot Adoption Technique (SPAT). In this regard, CRADP cited in Agbarevo (2005) observed that the strategies of OFAR are based on the farmers' perception of their constraints, whereas the techniques adopted include:

- A diagnostic survey of the farming communities to obtain the understanding of the farming practices and constraints as seen by the farmer;
- Analysis of the constraints to determine those that can be overcome with existing knowledge and those that require investigation through trials on farmer' farms;
- Planning of the trials;
- Execution of trial, and

- Analysis, evaluation and publication of results.

Participatory methodologies are a bottom-top approach in agricultural research and extension in contrast to top-down approach, which has proved to be ineffective in bringing about changes and improved agricultural production. Participatory approaches integrate farmers' fully as equal partners In generating and testing new ideas, techniques, technologies and practices leading to a more dynamic development, commitment and result at community level. Farmers are involved in the process of decision-making, implementing programmes, sharing costs and benefits of development programmes as well as evaluation of such programmes (Hagmann *et al*., (2010) and Nagel cited Agbarevo and Obinne, 2010).

Participatory research approaches build on the indigenous knowledge of the farmers to enhance the acceptance of innovations and consequently adopt them. They encourage the integration of desirable aspects of indigenous practices with foreign technologies in a manner that is compatible. Unless the local people/farmers are integrated in identification of needs, planning programmes, implementing and evaluation of such programmes/projects, their full cooperation would not be obtained, and adoption rates would remain low. Participation of farmers in research activities would, therefore, ensure greater success of agricultural development. This is because participatory approach is demand-driven and ensures the highest level of commitment and dedication to achieve success because the participants (farmers) are the ultimate beneficiaries of the expected dividends. In this regard, Roth (2001) observed that greater success in agricultural development was achieved by using participatory approaches rather than top-down bureaucratic approach, which has been criticized for being responsible for the failure of many agricultural projects and programmes.

MATERIALS AND METHODS

In conducting the study, 180 farmers participating in the Cross River State Agricultural Development Programme were randomly selected using the multi-stage random sampling technique. The state was divided into three existing ADP zones, which were further divided into extension blocks. The blocks were made up of cells and the cells made up of circles. In using the multi-stage random sampling technique, three blocks were selected from each of the three zones, giving a total of nine blocks out of the thirty blocks in the State; this constituted the first stage of the sampling. In the second stage of sampling, two cells were selected from each block, giving a total of eighteen cells. In the third and last stage, ten farmers were selected from each of the 18 cells giving a total of 180 farmers as the sample size.

The instrument used for data collection was a structured interview schedule for farmers. The interview schedule/questionnaire was designed to have farmers rate their participation in OFAR, which is a form of farming systems research. The reliability of the instrument was established using the test- retest technique. In doing this, the questionnaire was administered to a small group of 20 farmers with the assistance of extension agents. After 15days, the questionnaire was re administered to the same group of farmers. The product moment correlation co-efficient ® was computed, and a value of 0.96 was obtained. This implied that both sets of scores obtained were highly correlated, and thus reliable. The extension agents and enumerators assisted the researcher in administering the copies of the questionnaire.

The questionnaire was a graphic rating scale designed to measure participation of farmers in OFAR to which numerical scores were assigned thus: rarely participates = 1, often participates = 2, and always participates =3.The data obtained were analyzed using descriptive and inferential statistics, that is, the mean and the t-test respectively. The use of mean as a descriptive statistic was obtained using a 3-point graphics rating scale, which was modified thus: > 2.50 = (high participation), 2.0 – 2.50 = average participation, <2.00= low participation.

The hypothesis that there is no significant difference between the sample and population means regarding farmers' participation in OFAR was tested for significance using the t-test of significance of difference between the sample and population means at 95% confidence level (P ≤0.05). This is given by the formula:

$$t = \frac{\overline{\chi} - \mu}{\frac{s}{\sqrt{n-1}}}$$

Where:

$\overline{x}$=sample mean

μ=population mean, estimate: $\frac{1.96\ (\text{alpha} - \text{level})s + \overline{x})}{2\sqrt{n}}$

sd=standard deviation of sample

n=size of sample

RESULTS

Table 1 shows the level of farmers' participation in On-Farm Adaptive Research (OFAR). The table shows that 99 farmers representing fifty-five percent of the samples always participated in OFAR activities. 66 farmers, representing 36.7 per cent often participated, while 15 farmers representing 8.3 per cent rarely participated. The table further shows that those that always participated and those that often participated add up to 91.7 per cent with only 8.3 per cent rarely participating.

Table 1: Level of Farmers' Participation in OFAR

Always participates	Often participates	Rarely participates	Total
99	615	-	180
55%	36.7%	8.3%	100%

Table 2 is the t-test analysis of significance of difference between the sample and population means. The result shows that the sample mean was 2.446, while the population mean was 2.468. The critical value of t at 179 degree of freedom is 1.96, while the calculated value of t was 0.042. The difference between the sample and population means was found not be significant. Hence, the sample of the study is a true representation of the population from which it was drawn.

Table 2: t-Test Analysis of Significance Difference in Farmers' Level of Participation in OFAR

Groups	N	XSD	α -Level	t-cal	Table- t	Result
Sample180	2.466	0.646	0.05	0.042	1.96	Not sig.
Population	2.468					

DISCUSSION

The result of analysis showed that 55% and 36.7% of the farmers always and often participated in OFAR respectively. This means that 91.7% of the farmers can be said to have actively participated in OFAR. The mean score of 2.466 on a 3-point rating scale showed that, generally, the farmers in Cross River State who are registered with the Agricultural Development Programme, participate actively in joint On - Farm Adaptive Research (OFAR).This showed that the Cross-River State Agricultural Development (CRADP) and

Research personnel are succeeding in achieving the cardinal objectives of FSRE, which according to Amalu cited in Agbarevo (2014) is to concentrate on farmers' conditions, especially their constraints and expectations, and integrate them into the research and development process. This he further observed is a farmer-oriented problem-solving approach to agricultural research and extension based on the appreciation of farmers' production systems and their household interactions.

The high percentage of farmers (91.7%) participating actively in OFAR as found by the study showed that, farmers' needs and production challenges were addressed by OFAR. This finding agrees with the Darnhofer, Gibbon and Genoit (2012) who observed that Faming Systems Research provided answers to the challenges faced by rural farmers in the present rural and turbulent times. This is further accentuated by the finding of Okoli *et al.,* (1996), Anuebunwa (2000) and Udealor and Asiegbu (2006), who reported that farmers evaluate the extent any technology, or project met their needs and yearnings relative to overcoming their production problems and the compatibility of such technologies and projects with their farming system. Farmers would, therefore, accept to participate in such programmes/projects and adopt technologies that meet such concerns. Similarly, Agbarevo (2013) in a study found that farmers evaluate whatever programme/project or technology for its relevance to their felt-needs, and would key into any activity that would address their felt-needs, or demonstrates potentials for better benefits more than their existing practices.

CONCLUSION

Participatory research viz-a-vis farming system research and extension has proven to be an effective means of technology generation, adaptation of such technologies to farmers' condition leading to enhanced adoption of such technologies by farmers. Because it is a farmer-centered approach, which addresses farmers' production problems relative to their physical, social and economic environments farming Systems Research and Extension has become an effective tool in increasing farmers' productivity. This study has shown that farmers in Cross River State actively participate in Farming Systems Research and Extension activities vis-a-vis On-Farm Adaptive Research (OFAR) with 91.7% of the farmers often and always participating in OFAR activities. The study, therefore, recommends further strengthening of Research Extension Farmer Input Linkage Systems to build on the success already made for greater farmer participation, and consequently improved productivity.

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