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# Farmers' Perception of Effectiveness of Agricultural Extension Delivery in Cross-River State, Nigeria.

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***Abstract:*** *Evaluation of the success of extension delivery programmes, in most cases, has focused on farmers, viz-`a-viz behavioural change in terms of adoption as well as increased use of production inputs, yield, income and impact assessment (farmers standard of living). And when the indices on these variables are low, farmers are blamed for not responding to extension delivery programmes. However, the effectiveness and efficiency with which extension personnel deliver extension services cannot be over looked as this may in fact be a greater reason for success or failure of extension programmes. In this regard, the study was conducted to find out how farmers perceive or evaluate the effectiveness of extension delivery. In conducting the study, 180 farmers participating in extension programme in Cross River 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 means., The study found that farmers were unanimous that extension delivery process was not very effective as the study found no significant difference between the population and sample means at 95% confidence level. The strongest links in the delivery process areas were found to be farmer visits, meetings between farmers and extension personnel, demonstration, while the weakest links were organization of Research-Extension-Farmer-Linkages, farmer training programmes and distribution of training materials.*
***Keywords:*** *Perception, effectiveness, extension, delivery, farmers.*

## I. Introduction

Farmers have been blamed for poor adoption on the ground that they are conservative. The level of adoption should not always be used in measuring success or failure of extension delivery because the effectiveness of the extension delivery mechanism is to a large extent responsible for success or failure of extension programme. An alternative means of evaluating extension programmes is measurement of the learning situations provided, which is extension delivery mechanism or process as means of measuring extension effectiveness. Adoption focuses on behavioural changes in the farmer, while learning situations focus on extension personnel and their activities The effectiveness of extension personnel in conducting its activities can be used to assess success of extension programme. This is because if appropriate teaching/learning situation is provided, it follows that learning or relatively permanent and positive change in behavior of the farmer would take place. Such teaching/learning situations are effectiveness indicators (Misra,1997).

Extension effectiveness indicators are used to assess the effectiveness of extension personnel Hence, extension effectiveness may be determined by the level of awareness of extension services created among the farmers, number of visits paid by the village extension worker, percentage of scheduled meetings held between farmers and extension workers, number of field meetings held, regularity of meetings held by village extension worker, number of field days organized by village extension worker , monthly or quarterly, etc., number of demonstrations organized by the village extension worker within specified time frame (monthly, quarterly, annually), number of supervisory visits, number and regularity of research-extension linkage workshops and farmer training sessions/farmers trained. Extension effectiveness indicators are shown in table 1.

**Table 1: Extension Effectiveness Indicators**

| | | | |
|---|---|---|---|
| 1. | **Awareness** | - | number of farmers aware of village extension worker. |
| 2. | **Visit** | - | number of visits by village extension worker, say per month. |
| 3. | **Field meeting** | - | number of meetings held with village extension workers. |
| 4. | **Regularity** | - | number of meetings held by village extension worker with farmers on fixed days (percentage) |
| 5. | **Field days** | - | number of field days organized by village extension worker (monthly, quarterly, and annually (average) |
| 6. | **Demonstration** | - | number of (a) method demonstrations (b) Result demonstrations (c) method-cum-result demonstrations |

| | | | |
|---|---|---|---|
| | | | organized by village extension worker monthly, quarterly and annually. |
| 7. | **Supervision** | - | number of supervisory visits from Agricultural Extension Officers to village extension worker in the field per month (average) |
| 8. | **Research Extension Linkage** | - | number of research-extension linkage workshops organized monthly (average) |
| 9. | **Farmer Training** | - | number of farmers trained in farmer training centres/farmer training workshops organized |
| 10. | **Effectiveness** | - | which is the arithmetic average of the above indicators (composite indicators) |

**Adapted from D.C. Misra (1997) in B. E. Swanson et al. p. 157.**

Extension effectiveness model as a means of evaluating extension programme was highlighted by Ajayi (2005). In this model, extension programme is evaluated on the basis of achievement of project input delivery system. The model stresses determination of effectiveness through timeliness of input supply, distribution of machinery and their availability, among other variables. Effectiveness emphasizes what extension personnel accomplish in terms of the activities it has scheduled for itself to undertake as well as how resources, such as capital, manpower, goods and services, training and technologies needed for implementation of the programme have been used (Williams 1984). It has been observed that the extension delivery has recorded poor performance with regard to extension effectiveness indicators, especially with regard to farming systems research and farmer training programmes, which have been identified as weak links in the agricultural extension delivery in Nigeria. This could be attributed in part to:

- the researchers inadequate consideration of externalities and the substantial resources that would be needed for it to keep pace with the dynamics of farming systems;
- scientist being inadequately prepared for face-to-face dialogue with farmers, and
- researchers' tendency to dominate the design, content, conduct and evaluation of the on-farm testing (Amalu, 1998 & Uza *et al.,* 1999).

Amalu (1998) further observed that faulty planning by either the research managers and/or their collaborators caused most problems that have been observed in research trials. The problem is worsened by the fact that a large number of scientists from research institutes and universities are now working with the ADP-sponsored on-farm research trials. Several among them are eminently qualified scientists who are knowledgeable in pure basic research but are grossly inexperienced in applied or adaptive research methodologies. And most of the new entrants have been insufficiently trained in On-Farm Adaptive Research (OFAR) methodologies, he concluded.

Poor participation of farmers in research-extension-farmer linkage activities has been attributed to top-down approach in contrast to participatory approach to mainstream the resource-poor farmers into research-extension activities (Morris & Igbokwe, 2001; Agbarevo & Obinne, 2010).

Extension efforts aimed at improving agriculture require an understanding of existing farming systems along with how resources and technology (local and foreign) can help overcome farmers' production problems. Moreover, opportunities exist for integration of local and foreign technology in a compatible and economically sound manner, and should be vigorously pursued since horizontal transfer of technology from developed to less developed countries of the world as well as top-down transfer of technology has been very successful ((Agbarevo, 2007).

Consequent upon the above, it is the objective of this study to determine how farmers perceive effectiveness of extension delivery mechanism, that is, how effective extension personnel are in the conduct of extension activities.. In this regard, the paper hypothesizes that there is no significant difference in the farmers' perception of the effectiveness of extension delivery by the Cross-River Agricultural Development Programme (ADP).

## II. Description of Area of Study

The area of study, Cross River State of Nigeria, is in the South- South geo-political zone of Nigeria. It is bounded to the south by the Atlantic ocean, to the east by the Republic of Cameroon, to the south-west by Akwa-Ibom State, to the west by Abia and Ebonyi States, and to the north by Benue State. It lies between the co-ordinates of latitudes $6^{o}$N and $8^{o}$E of the Equator. There are three main cities in the state: Calabar (the state capital) in the south, Ikom in the central zone and Ogoja in the northern zone. The inhabitants of the state are

mainly farmers. Most of the local governments have several rivers, which encourage fishing activities. The farmers are mainly resource-poor. Farmers in the south and central zones are predominantly arable crop farmers. Crops produced include maize, yam, cassava, plantain, banana, cocoa yam, etc. However, Ikom in the central zone is noted for production of cocoa in addition to the other crops. Boki Local Government, which is also in the central zone is noted for the production of cocoa and palm oil in commercial quantities. Farmers in the north produce cassava, yam and maize but to a less extent. They, however, produce rice and groundnuts in greater quantities than the other zones. Generally, cassava, yam and maize are the major crops grown in the state.

The state has a population of about 3million and a land mass of 22156 square kilometers with wide expanse of arable lands, which encourage arable and plantation farming. As typical of areas in Nigeria with many rivers, the state has a multiplicity of languages with more than one language spoken in some local governments. Cross River State is adapted to the production of a wide range of crops because of variation in the soil and climatic conditions. The south of Cross River and its environs are essentially mangrove forest, swamp and tropical rainforest. Cross River central is essentially a rainforest belt, while Cross River North is essentially guinea savanna belt.

## III. Materials and Methods

The population of the study consisted of all the resource-poor farmers who participate in agricultural extension programme in Cross-River State. The sample size consisted of one hundred and eighty resource-poor men and women farmers selected from the three ADP zones in the state. Sixty farmers were selected from each zone, giving a total of 180 farmers with 10 farmers from each of the cells in the blocks selected.

To obtain a representative sample, the stratified sampling technique was used. The state was divided into three ADP zones or strata. The ADP zones were further stratified into extension blocks and finally cells .Three extension blocks were randomly selected from each of the three ADP zones using the balloting with replacement method. Hence, a total of 9 extension blocks were selected. The extension blocks were further stratified into cells, and two cells were randomly selected from each of the nine blocks giving a total of eighteen cells. Ten farmers were selected from each cell. This gave a sample size of 180 farmers.

The instrument used for data collection was a structured interview schedule/questionnaire for farmers. The interview/schedule/questionnaire was designed to elicit information on farmers' perception of extension effectiveness. The method of validating the instrument used to ensure its reliability was the test-retest technique.. 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 extension effectiveness with regard to each of the effectiveness indicators to which numerical scores were assigned thus: not effective = 1, effective = 2, and very effective = 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 graphic rating scale, which was modified thus: >2.50 = high (very effective), 2.0 – 2.5 = average (effective), <2.00 = low (ineffective). A mean of 2.00 was used as cut-off point to determine effectiveness or ineffectiveness of extension personnel with respect tom each of the effectiveness indicators. Thus, a 3-point graphic rating scale of 1, 2 and 3 add up to 6, which gives 2 as mean, when divided by 3.

The hypothesis that there is no significant difference between the sample and population mean ratings of farmers regarding extension delivery effectiveness was tested for significance using the t-test of significance of difference between the sample and population means at 95% confidence level ($P \leq 0.05$). This is given by the formula:

$$\mathbf{t} = \frac{\bar{X} - U}{\frac{s}{\sqrt{n-1}}}$$

where

$\bar{X}$ = sample mean

U = population mean estimate = alpha – level (0.05) $\frac{(S)}{\sqrt{n}} + \bar{X}$

S = standard deviation of sample

n = size of sample

**Table 2: Mean Ratings Of Farmers' Perception Of Effectiveness Of Extension Delivery (N=180)**

| | Extension Effectiveness Indicators | Very Effective (Fx3) | Effective (FxX) | Not Effective (Fx1) | $\bar{X}$ |
|---|---|---|---|---|---|
| 1. | Creating awareness of extension service | 573 | 0 | 9 | 2.9** |
| 2. | Visiting farmers | 351 | 78 | 24 | 2.5* |
| 3. | Organizing field meeting With farmers | 369 | 72 | 21 | 2.6** |
| 4. | Holding scheduled meetings with farmers | 468 | 36 | 6 | 2.8** |
| 5. | Organization of field days | 390 | 28 | 36 | 2.5* |
| 6. | Organization of method demonstrations | 441 | 36 | 15 | 2.7** |
| 7. | Organization or result demonstrations | 423 | 42 | 18 | 2.7** |
| 8. | Organization of method/result demonstration | 423 | 36 | 21 | 2.7** |
| 9. | Organization of research/extension linkage workshops | 243 | 96 | 21 | 2.2** |
| 10. | Farmer training programmes | 207 | 108 | 57 | 2.1* |
| 11. | Participation of farmers in OFAR | 297 | 132 | 15 | 2.5* |
| 12. | Distribution of pamphlets, leaflets, etc | 108 | 108 | 90 | 1.7 |
| 13. | Organization of audio-visual shows | 207 | 30 | 96 | 1.9 |

* Effective
** Very Effective

**Table 3. Significance of Difference In Perception Of Extension Effectiveness Among Farmers**

| **Groups** | **N** | $\bar{X}$ | **SD** | **p** | **t-cal** | **table-t** | |
|---|---|---|---|---|---|---|---|
| Sample | 180 | 2.44 | 7.97 | 0.05 | 0.68 | 1.96 | Not Sig. |
| Population | | $\bar{}$ 2.48 | | | | | |

**Decision: Null hypothesis accepted.**

## IV. Results And Discussion

The data as presented in Table 1 show the percentage achievement of Cross River State Agricultural Development Programme with respect to effectiveness indicators The result shows that there exists a high level of awareness among farmers about the existence of extension agents. The level of awareness was found to be 94.82 percent. This is where extension effectiveness is highest.

The Cross River ADP scored high in holding fixed meetings with farmers (87.93 percent). The performance of the Cross River ADP in other effectiveness indicators were as follows: method demonstrations conducted (82.75%); result demonstrations conducted (79.31%); method/result demonstrations conducted(77.58%); while effectiveness in conducting of field days was (72.41%).

Extension effectiveness in visiting farmers was 65.55%, while supervisory visits by extension officers from headquarters and zonal offices was 60.12%. Although extension performance in these two areas was not bad, there is need for improvement.

However, extension delivery was poor in the following areas: research-extension-farmer linkage through On-Farm Adaptive Research (46.55%) and farmer training programmes that were executed (39.65%). The result shows that the poorest performance of Cross River ADP is in the area of organizing farmer-training programmes in farmer training centres. However, the average percentage achievement of 70.67 percent of set targets is considered good. But the poor effectiveness in On Farm Adaptive Research – OFAR and farmer training is a matter for concern.

The study found the average percentage level of effectiveness of extension activities to be 70.67%. The percentage average of the performance of extension delivery with respect to the performance indicators as

reflected in table 1 could be used to assess the effectiveness of the delivery system (Misra, 1997). While a performance rating of 70.67% may appear good, the study found that the Cross-River ADP performed poorly in few but very important areas of extension delivery, viz: farmer training programmes (39.65%), research extension farmer linkage (46.55%). This was due to poor funding with the withdrawal of World Bank funding as well as inadequate research personnel. Although the performance of Cross River ADP was high in conducting demonstrations, organization of field days and holding meetings with farmers.

The poor performance of Cross River ADP in farmer-training programmes and research-extension-farmer linkage is a source for serious concern as these areas constitute strong pillars in extension delivery. Creating awareness and conducting demonstrations, which are areas of strength in the Cross River Agricultural Development Project were unable to bring about high adoption in the absence of adequate farmer training programmes and farming systems research and extension programmes. Because farming systems research and extension is a participatory approach to extension delivery, which is farmer centered, its poor execution, no doubt, contributed to the low adoption of technologies by the resource-poor farmers. The poor performance of the Cross-River Agricultural Development Project in Farming Systems Research and Extension (FSRE) as found by the study is supported by the findings of Amalu (1998) who reported that, Farming Systems Research and Extension is a weak link in the agricultural extension delivery in Nigeria. According to him, the short-comings of Farming Systems of Research and Extension, (FSRE) in Nigeria are attributable in part to:

(a) the researchers' inadequate consideration of externalities and the substantial resources that would be needed for it to keep pace with the dynamics of farming systems;
(b) scientists being inadequately prepared for face-to-face dialogue with farmers, and
(c) researchers' tendency to dominate the design, content, conduct and evaluation of the on- farm testing.

Amalu (1998) further observed that faulty planning by either the research managers and/or their collaborations cause most problems that have been observed in research trials. The problem is worsened by the fact that a large number of scientists from research institutes and universities are now working with the ADP-sponsored on-farm research trails. Several among them are eminently qualified scientists who are knowledgeable in pure basic research but are grossly inexperienced in applied or adaptive research methodologies. And most of the new entrants have been insufficiently trained in OFAR methodologies, he concluded.

The poor participation of farmers in on-farm adaptive trials (OFAR), which the Cross River Agricultural Development Project had earlier identified as one of the ways of actualizing its objective of incremental food production is worrisome considering the emphasis given to OFAR in Cross River ADP policy document (Lebo, 1986). Such poor participation of resource-poor farmers in OFAR as found by the study is equally similar to that by Swanson (1997) who observed that the poor participation of farmers in research-extension-farmer linkage activities is attributable to non-use of participatory approach to mainstream the resource-poor farmers into research-extension activities.

Furthermore, the findings of Otuokere (1988) regarding poor inter-organizational co-ordination between research and extension which adversely affects OFAR give further support to the findings of this study, that research-extension-farmer linkage activities are poorly executed. He further observed that the frequency of contracts between researchers and extension staff was sporadic and in some cases lacking. The poor performance of Cross-River ADP in research-extension-farmer linkage activities as well as farmer training as reported by the study is accentuated by Amalu (1998), who observed that inadequate human resources has remained a problem in agricultural research. He, therefore, advocated the training of young researchers/scientists and subject matter specialists from the Agricultural Development Projects in the general farming systems, research and extension approach.

The finding of the study that farmer-training by extension staff is a weak link in the extension delivery system of Cross River ADP has been attributed to the low capacity of extension services in the agricultural development programmes, which has often been blamed on field extension agents whose responsibility it is to educate the farmers on improved farm practices and resources available to them (Uwaka, 1980; Iwueke, 1990). Farmer training is a very important aspect of agricultural extension delivery. Poor farmer-training programmes would invariably affect adoption of technological recommendations packaged to farmers.

Under the Training and Visit (T and V) system of agricultural extension delivery used by CRADP, the extension agents (EAs) attend forth-nightly training (FNT) sessions where they are taught by subject matter specialists (SMSs). The subject matter specialists themselves are taught by research personnel in monthly 2-day training meetings –Monthly Technological Review Meetings (MTRMs). The extension agent is supposed to select eighty 'contact farmers' to teach the application of technological recommendations. The contact farmers are expected in turn to teach the non-contact farmers in their various groups. Thus, the recommended ratio of extension agent to contact farmer of 1:8, cannot be met by Cross River ADP. Rather, it is one extension agent to eighty contact farmers (1:80). With this high ratio of extension agent to farmer, the extension agent is over burdened. This in part explains why organization of training sessions for contact and non-contact farmers

constitutes a weak link in the extension delivery of CRADP. However, the performance of the CRADP in the coming years is expected to worsen because of the recent redeployment of extension agents to secondary schools as agricultural science teachers, which puts the extension agent-contact farmer ratio at about 1:160. This portends great danger to agricultural extension delivery in the state.

Apart from the high farmer extension agent ratio, another problem responsible for poor organization of farmer-training programmes in developing countries, like Nigeria is that training activities may be beyond the capability of most field extension workers (Swanson, *et al.* 1984). In such a situation, they recommended that field extension staff should identify groups of farmers that need assistance and then coordinate the provision of such services by extension specialists.

Furthermore, the findings of the study that poor extension delivery service, especially with regard to farmer-training programmes and research-extension-farmer activities was largely responsible for poor adoption of recommendations is corroborated by the findings of Chinaka *et al.* (2005) who reported that effectiveness of extension delivery influences adoption by farmers, and that, poor extension delivery would lead to poor adoption.

Other areas of weakness in the extension delivery of Cross River ADP as found by the study were in the distribution of extension leaflets, pamphlets and posters as well in the organization of audio-visual shows (as seen in items 12 and 13 of table 2). Pamphlets, leaflets and posters are very valuable training materials in extension delivery, likewise the use of audio-visual aids. It is not surprising to observe poor performance in these areas since they form part of training programmes which they study had earlier identified as a weak link in extension delivery. The importance of print and audio-visual aids in extension training programmes according to Youdeowei and Kwarteng (1995) include the following:

- making the learning process more interactive; guides trainees and trainers during training.
- serve as reference during and after training;
- contain useful illustrations which facilitate learning;
- make learning interesting by attracting and holding attention of trainees especially visual aids;
- effectively convey messages which are easy to understand.

The findings of the study and the observations of Youdeowei and Kwarteng (1995) lead to the conclusion that extension training programmes cannot be effectively conducted without printed teaching/learning aids as well as audio-visual materials. Zeitlyn (1992) further amplifies the role of training materials as appropriate media for trainers or field workers in communication in agriculture. He observed that trainers or field extension staff/workers need training materials in form of manuals, visual aids, worksheets, posters/leaflets, radio and television. Such training materials, he went further to state, should be used in the following ways in agricultural training to optimize adoption

- manuals should be used as training guides which help extension workers to run training and use media and materials to communicate effectively;
- visual aids, which are needed for use in training sessions for all trainees to see and understand the message. Such message should be appropriate for the culture, context and support of the trainer worksheets, which help trainees practice new skills during training and after training sessions
- posters/leaflets, which help the trainee take the training message home to neighbours and family. It helps to implement the training by reminding them of what they learnt;
- radio/television, as broadcast media are used to support training by creating demand for learning the skill. It also reminds trainees to implement and follow up their training at home.

The study posits that lack of and poor use of training materials by Cross River ADP partly contributed to its poor performance in organizing farmer-training programmes. The analysis of data as shown in table 3 shows no significant difference in farmers' rating of extension effectiveness. The farmers were unanimous that CRADP is not very effective.

## V. Conclusion

A number of variables influence the adoption of agricultural extension recommendations by farmers, and one of such variables is effectiveness of extension delivery. When adoption is low, it should not always be attributed to farmers unwillingness to adopt as poor extension delivery mechanism, cost, usability social desirability, sustainability of innovation, among other variables may lead to non- adoption. A key factor in the adoption process is how well extension activities are organized and delivered. If adequate delivery activities are conducted with adequate materials and personnel, then we can expect high adoption, while low adoption should be expected if the contrary is the case.

The study has identified the weak links in the Cross River State extension delivery mechanism hindering adoption, which included poor organization of Research-Extension-Farmer-Input-Linkages. (REFILS), farmer training programmes and distribution of training materials. Unfortunately, these weak areas are key to success of extension programme because technology transfer cannot be effected without adequate linkages between

research, extension and farmers. Evaluation of success or failure of extension programmes cannot be properly done without assessing the effectiveness of the delivery process. The paper, therefore, concludes that any evaluation of extension programme should be done in terms of rate of adoption, programme effect and impact relative to the effectiveness and efficiency of extension delivery process.

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