

*Full Length Research Paper*

# **Evaluation of the relevance of packages of extension recommendations on cassava to farmers' felt needs in Cross-river State, Nigeria: Implications for the attainment of Millenium Development Goal on food security**

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**Relevance of packages of improved agricultural technologies to farmers' felt needs would influence how readily the farmers adopt them as well as the attainment of the goal of self-sufficiency in food production vis-à-vis the Millennium Development Goal on food security. The study was, therefore, conducted to evaluate the relevance of extension packages of improved technologies to farmers' felt needs in Cross River State, Nigeria. In conducting the study, 180 farmers participating in extension program 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 means. The study found that farmers were unanimous that most of the extension recommendations were not very relevant to their felt needs. There was no significant difference between the farmers' rating of the relevance of extension recommendations and their felt needs. As such the null hypothesis was accepted and the alternative hypothesis rejected at 0.05 level of significance. Some recommendations were also made**

**Key words:** Evaluation, relevance, recommendations, cassava, farmers, felt-needs, Cross River.

## **INTRODUCTION**

Agricultural extension delivery has as its major goal, getting farmers to adopt improved agricultural technological recommendations with a view to increasing yield and productivity. Hence, the attainment of the Millennium Development Goal on food security would be influenced by how well extension recommendations are packaged to reflect farmers' felt needs and how effectively they are delivered, among their variables. Cassava is a staple food in Nigeria with high export potentials. However, the annual growth rate of cassava production of 1.3% has not been encouraging with a projection of 43,000,000 metric tones by the year 2014 (FAO 2005). This poor growth rate of production should

be a matter of great concern vis-à-vis the attainment of the Millennium Development Goal on food security in Nigeria. Efforts aimed at making extension recommendations more relevant to farmers felt needs with a view to increasing adoption of such recommendations and consequently, yield cannot be overemphasized.

The adoption of improved technology by rural farmers is influenced by the extent the farmers feel their felt needs would be met by adopting such recommendations. In this regard, Titilola (1990) observed that some modern technologies packaged by extension staff to farmers were neither useful nor readily adaptable, while many transferred to least developed countries proved to be very

ineffective.

The need to overcome problems occasioned by over reliance on modern agricultural technologies to improve productivity has given greater impetus to the efforts aimed at developing technologies and methods of production that focus on the farmers' felt needs and use of local materials as well as the adaptation of foreign technology to local conditions.

The low rate of adoption of extension packages of recommendations by farmers in Nigeria has been partly attributed to the neglect of the farmers' areas of need, cumulative experiences, knowledge and advances made by local farmers in consonance with their environment. The extension paradigm in most cases has bypassed the local sustainable resource management strategies of rural farmers, often introducing innovations that are impracticable or directly threatening to the resource – poor farmer. This has continued in spite of the warning of the difficulty, if not impossibility of direct transfer of the product of technology and know-how to developing countries (Rau, 1991).

Resource poor farmers are conscious of their needs and constraints associated with their farming environments in their efforts to realize their goals of production, income, security and conservation of their resource base. Therefore, they weigh the expected benefits of any recommendation from extension services against these variables to determine their sustainability or otherwise before adoption. Only recommendations that give the highest promise of meeting such needs are adopted. Therefore, extension efforts aimed at improving agriculture require an understanding of the existing farming system and how recommended technology can increase productivity by relieving such constraints (Mazur and Titilola, 1992).

The Mokwa farm settlement scheme in the former Northern Region of Nigeria failed because it failed to address the needs of the farmers. It ignored local farmers' knowledge and attempted to displace self-sufficient sustainable farming methods and livelihoods of the people among other socially undesirable practices. The project failed and was, therefore, terminated in 1953. Extension recommendation should therefore be technically and environmentally sound, socially desirable, economically affordable and sustainable (Titilola, 2004).

It has been reported (Agbarevo, 2008) that recommendations which farmers regarded as very relevant to their felt needs recorded high adoption while those that did not address their felt need recorded low adoption rates. The need to ensure that extension technological recommendations addressed farmers' felt needs cannot, therefore, be overemphasized.

Participatory approach to extension delivery has been advocated as a means making extension packages of recommendations more relevant to the farmers needs, and consequently increases adoption and farmers'

productivity. In this regard, Agbarevo and Obinne (2010) observed that extension and research personnel should work cooperatively with farmers in identifying their needs and problems, prioritizing them, analyzing them, and seeking alternative means of solving them, choosing preferred alternatives and a course of action, monitoring and evaluation of programs. Adoption of recommended innovations would record high rates with the concomitant increase in farmers' productivity to meet the MDG goal on food security if the recommendations addressed farmers' felt needs. Against this background, the specific objectives of this paper are to: 1. Identify the recommendations packaged by the Cross River Extension Service. 2. Determine farmers' rating of the relevance of cassava production recommendations to their felt needs, that is, determine which recommendations are very relevant, relevant or irrelevant to farmers' felt needs. 3. Determine if there is any significant difference in the farmers' rating of the relevance of extension recommendations to their felt needs, and 4. Examine the implications in meeting the MDG goal on food security, and make some recommendations based on the findings made. The rationale of the study is that extension recommendations should be packaged to reflect farmers' felt needs if high adoption rates are to be achieved. The guiding premises of the study are that:

1. Perceived relevance of extension recommendations by farmers affects adoption of such recommendations.
2. If farmers do not consider certain recommendations relevant to their needs, they would not adopt them.
3. Farmers' ascribed relevance to extension recommendations is expected to positively correlate with the level of adoption of such recommendations.

The study is expected to be significant in that it would reveal how relevant the extension recommendations are to the farmers' felt needs, that is, it would reveal the strengths and weaknesses of the recommendations in meeting the farmers felt needs. Hence, the study would be useful to the extension service in appraising the acceptance and adoption of extension recommendations by farmers in order to improve extension service delivery.

Consequent upon the above, the following key research questions have been formulated to guide the study:

1. What are the extension recommendations packaged to farmers by the Cross River State Agricultural Development Program for adoption?
2. How relevant do farmers perceive them to their felt needs?
3. How do farmers rate the relevance of the various recommendations to farmers felt needs?
4. Is there any significant difference in the farmers rating of the relevance of extension recommendations to their

felt needs?

The paper, therefore, hypothesizes that there is no significant difference in the farmers' mean rating of the relevance of extension recommendations to their felt needs.

## MATERIALS AND METHODS

### Description of the study area

Cross River State, which is the area of study, is in the South South geo-political zone of the country, 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 coordinate latitudes 6°N and 8°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 study covers the entire state.

The inhabitants of Cross River State are mainly farmers. Most of the local governments in the state have several rivers, which encourage fishing activities. The farmers are mainly resource-poor. Farmers in the south and central zones of ADP are predominantly arable crop farmers. Crops produced include maize, yams, cassava, plantain, banana, cocoa yams, etc. However, Ikom in the central zone is noted for production of cocoa, while Boki Local Government equally produces cocoa and palm oil in commercial quantities. Farmers in Cross River North produce cassava, yams and maize but to a less extent. They, however, produce rice, groundnut and to a less extent guinea corn and millet. Generally, yam and cassava are the major crops grown.

The state had a population of 2 million by 1991 census, and a current projected population of 2.7 million using 2.5% annual growth rate. As typical of riverine areas, the state has a multiplicity of languages with more than one language spoken in some local governments. The state has a land mass of 22156 square kilometers with wide expanses of arable lands, which encourage arable and plantation farming.

Cross River State is ecologically adapted for production of a wide variety of crops because of variation in soil and climatic conditions. The south of Cross River and environs are essentially mangrove forest, swamp forest and tropical rainforest. Cross River central is essentially rainforest belt. The north of Cross River North is essentially guinea savanna.

In conducting the study, 180 farmers participating in the Cross River State Agricultural Development Program 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 elicit information on farmers' perceived level of relevance of extension packages of recommendations to their felt needs. An excellent method of validating the instrument used to ensure its reliability was the test-

retest. Thus making the results obtained 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 the relevance of each recommended practice to the farmers' felt needs to which numerical scores were assigned thus: not relevant = 1, relevant = 2, and very relevant = 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 (very relevant), 2.0 – 2.50 = average (relevant), <2.00 = low (irrelevant). A mean of 2.00 was used as cut-off point of relevant or irrelevant recommendation. Thus, a 3-point graphic rating scale of 1, 2 and 3 add up to 6, which gives 2 when divided by 3.

The hypothesis that there is no significant difference between the sample and population mean ratings of farmers regarding the relevance of extension recommendations to their felt needs 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:

$$t = \frac{\bar{x} - u}{\frac{s}{\sqrt{n-1}}}$$

Where

population mean estimate =  $(\alpha - level) \frac{s}{\sqrt{n}} + x$   
 $\bar{x}$  = sample mean;  $u$  =  
 $S$  = standard deviation of sample;  $N$  = size of sample.

### Delimitation of study

The study was delimited to Cross River State of Nigeria because there is no general extension service in Nigeria since the various geo-political zones in Nigeria have somewhat unique agro-climatological variables which determine the nature of agricultural production in the various zones. Therefore, there is no uniform package of extension recommendations for the entire country. Hence, the study was limited to Cross River as a case study.

## RESULTS AND DISCUSSION

In relation to objective 1, Table 1 shows the identified cassava production recommendations packaged by the Cross River Extension Service and farmers' ratings of the relevance of various extension recommendations to their felt needs. The table shows that the most relevant recommendation to the cassava farmers' felt needs is fertilizer types, methods and time of application, with a mean rating of 2.74, which indicates very relevant. Another recommendation considered 'very relevant' by the farmers was herbicide application, with a mean rating of 2.61. Other recommendations such as SPAT-cassava based inter-planted with melon and maize, planting cassava, groundnuts, maize as a course at specific spacing and time, crop rotation, planting legumes in rotation, early planting, chemical pest/disease and

**Table 1.** Mean ratings of the relevance of the identified recommendations to farmers' felt needs.

No.	Recommendation	Not relevant (Fx1)	Relevant (Fx2)	Very relevant (Fx3)	Mean
1	SPAT Cassava based Inter planted with melon and maize	10	182	237	2.04*
2	Planting cassava, groundnut, maize as a course at specific spacing and time.	21	262	84	2.04*
3	Crop rotation	31	232	99	2.01*
4	Planting legumes in rotation	44	172	150	2.03*
5	Early planting	6	192	158	2.39*
6	Use of melon as cover crop				2.40
7	Use of Neem leaves as mulch/surface cover	115	114	24	1.41
8	Use of yam bean for pest control	30	228	18	1.87
9	Compost making	33	238	56	1.97
10	Fertilizer types time and Methods of application	3	82	108	2.74**
11	Herbicide use	4	129	342	2.61**
12	Chemical pest/Disease	8	202	213	2.35*
13	Keeping proper records	46	168	150	2.02*

\*Relevant; \*\*Very relevant.

**Table 2.** Significance of difference in farmers' rating of the relevance of extension recommendations to their felt needs.

Group	N	$\bar{x}$	SD	p- Level	t-Cal	Table t	Result
Sample population	180	2.12 2.14	0.60	0.05	0.4	1.96	Not Sig.

Decision: Null hypothesis accepted.

keeping proper records were rated 'relevant', while the use of yam bean for pest and disease control, use of neem leaves as mulch/surface cover, and compost making were rated 'irrelevant' by the resource-poor cassava farmers.

Table 2 shows t-test analysis of significance of difference among farmers in their rating of the relevance of extension technological recommendations to their felt needs. The analysis shows no significant difference between the sample and population means regarding the farmers' rating of the relevance of extension technological recommendations to their felt needs. The analysis of t-test of significance shows that the calculated t-value of 0.2 at 178° of freedom is less than the critical value of 1.96. This was found to be not significant at 95% ( $P \leq 0.05$ ) confidence level. Hence, the null hypothesis that there is no significant difference between the sample and mean population means regarding the farmers' rating of the relevance of extension technological recommendations to their felt needs was accepted while the alternative hypothesis was rejected.

The finding of the study, that farmers evaluate the

extension recommendations for their relevance to their felt need before adoption is supported by Abalu in Udealor and Asiegbu (2006), who observed that farmers would adopt cassava production technologies they considered compatible with their farming systems. In the same vein, Imo and Essien (2005), found that adoption was influenced by the farmers ascribed value (or relevance) of the technology delivered to them by agricultural extension for adoption. The farmers, as shown by the study, considered the Small Plot Adoption Technique (SPAT) cassava based, intercropping cassava with legume as relevant technologies to their needs, which is in agreement with the findings of Udealor and Asiegbu (2006) who reported that cassava/legume intercropping produces increased cassava root yield. This further shows that farmers ascribed relevance or value to this technological recommendation (cassava/legumes intercropping) in meeting their need for increased yield is supported by research result. The yield advantages arising from intercropping cassava with cover crops/legumes were equally amplified by Okoli et al. (1996), Muoneke and Asiegbu (1997) and Anueburwa (2000).

Other technological recommendations which the farmers considered relevant to meeting their production goals included spacing, time of planting crop rotation, early planting, cover cropping, use of fertilizers types, methods and time of application, herbicide application, chemical pest and disease control and keeping farm records. In this regard, Jirgi and Baba (2000) reported that farmers were willing to use improved seeds, agro-chemicals, pesticides and fertilizers, and that their limited use was as a result of unavailability with chemical fertilizer use recording high adoption rate. The very high rate of adoption of fertilizer use reported in that study is a reflection of level of relevance the farmers ascribed to fertilizer use in increasing yield. This is in consonance with the finding of this study on fertilizer use by farmers as they considered it a very relevant technology. This is further underscored by the assertion of Norman in Jirgi and Baba (2000) who reported that chemical fertilizer was the main modern input of technology and that its use by farmers was limited by high cost and inadequate supply. Thus study like other studies cited above show that farmers considered fertilizer application as the most relevant or valuable technological recommendation in increasing yields. Where farmers do not use fertilizer, it is not that they are conservative rather it is the prohibitive cost, or unavailability.

## IMPLICATIONS AND CONCLUSION

The findings of this study show that farmers carefully evaluate technological recommendations packaged to them by extension services as to whether they address their felt needs before adopting them. This implies that extension services should not expect out right adoption of extension recommendations because they have been adjudged good by research and extension personnel. Unless they addressed farmers' felt needs, low adoption would be recorded. Hence, non-adoption is not necessarily as a result of farmers' conservatism or high cost, but may be due to irrelevant technological recommendations that do not address farmers' needs.

This further implies that the greater the relevance of recommendations to farmers' felt needs, the greater the adoption would be and the greater the results in terms of farmers' productivity towards meeting the Millennium Development Goal (MDG) on food security.

The paper concludes that farmers should be brought into the main stream of extension/research activities identifying and prioritizing, production problems, analyzing and seeking solutions to them within the contextual framework of participatory extension to make the recommendations farmer-friendly. This would lead to increases in adoption, food production and the farmers'

general well being. Foreign technology considered necessary to improve production should be tested for adaptability and acceptability before pushing them for adoption by generality of the farmers for a better result to be obtained.

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