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Constraints to Effectiveness of Research –Extension-Farmers –Inputs –Linkage System (REFILS) among Maize Farmers in Nigeria

M.O. Oyedokun, A.S. Amusat and T.C. Idowu
Institute of Agricultural Research and Training, Obafemi Awolowo University, Moor Plantation, Ibadan, Nigeria
Corresponding Author: niyiamusat2000@yahoo.co.uk

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Abstract: *REFILS is a strategy put in place to create a flow of information from research to farmers so as to address the problem of incessant low productivity in agriculture. This study investigated the constraints to effectiveness of REFILS among maize farmers in Nigeria. Multi-stage sampling was used to select 198 farmers from the 3 states of Niger in Northcentral, Kaduna in Northwest and Oyo in Southwest, Nigeria. Data were analyzed using descriptive statistics such as frequencies, percentages, means and standard deviation. Findings revealed that majority of the respondents (59.6%) were within the age brackets of 41-50 years, married (99.5%), had one form of education or the other (62.6%), practised mixed cropping (84.8%), had 15-19 years of experience (34.3%) with farm size of 1-3 hectares (46.5%). Respondents ranked ADPs/ Extension agents (M=1.86+_o.67), radio (M=1.30+-0.43) and farmers' association (M=1.13+-0.57) 1st, 2nd and 3rd respectively as their preferred linkage options in REFILS while, high cost of farm inputs (M=1.8+- 0.5), non-involvement in planning of REFILS workshop (M=1.6+-0.7) and inadequate credit sources (M=1.5+-0.7) were regarded as major constraints confronting maize farmers in REFILS. The budgetary allocation to agriculture needs to be reviewed upward and REFILS coordinator in the zones should endeavor to carry farmers along in all REFILS activities.*
Keywords: agricultural extension, REFILS, constraints, linkage, maize farmers.

INTRODUCTION

Over the years, agricultural extension has been at the fore-front in the delivery of adequate information to farmers for increased productivity. According to (Idris-Adeniyi et al.,2024) agricultural extension service delivery all over the world has been concerned with communicating research findings and improved agricultural practices to farmers. Agricultural extension service is saddled with the responsibility of disseminating innovation that could transform agricultural production to ensure food security and economic development of agrarian community. Information and knowledge

are very vital in agricultural development of any community and where they are poorly disseminated the community is at a risk of development, (Okunlola and Sani 2023) observed that agricultural extension depends largely on information exchange between farmers and broad range of other actors who are the front line extension workers that are the direct link between farmers and other actors in the agricultural knowledge and information system (AKIS). Clara and Glad (2024) opined that the mission of the extension service is to provide research-based information, educational programs, and technology transfer and needs of the people, enabling them to make informed decisions about their economic, social and cultural well-being. Agricultural extension aims to disseminate relevant information for effectiveness and efficiency of agricultural activities but is confronted with certain constraints . According to (Johnson 2024) lack of access to basic agricultural knowledge and information by rural farmers can be assumed to be as a result of some constraints to effectiveness of agricultural extension activities which have made these farmers to stick to their old traditional methods of farming system and animal husbandry practice, hence resulting in poor crop and livestock productivity.

Attempt to boost food production in Nigeria led to the introduction of some strategic programmes, one of which was the Agricultural Development Programmes (ADPs) and evolution of Research - Extension – Farmers- Linkage in the country. The rationale for Research –Extension-Farmers –Inputs –Linkage System (REFILS) is to link the various components in order to create a flow of information from research to farmers so as to address the problem of incessant low productivity in agriculture. REFILS is defined as the interplay of research, extension, farmers and input supply agencies in a cost-effective manner aimed at rapidly increasing agricultural production and productivity of resource-poor farmers. The Research –Extension – Farmers – Input –Linkage System (REFILS) represents the framework of the coordination of research and extension activities in all agricultural zones of the country.

Research – Extension – Farmers – Input –Linkage – System (REFILS) is a strategy of the Federal Government of Nigeria to ensure effective agricultural research, extension and input delivery services for farmers in the country. One of the most debilitating problems of research and policy in Agricultural Extension in developing countries like Nigeria is the rate at which available research results are lost. There is a lag of 50 years between discovery of innovations and their effective utilization in the field. The above scenario implicates weak research farmer linkage and exposes inefficient extension service which prevailed in pre and post independent Nigeria before the establishment of a state wide Agricultural development Project (ADPs) in 1986. An active and virile sustainable ADPs anchored on the Research-Extension farmer-input linkage system (REFILS) is a vibrant and veritable extension instrument for effective technology transfer by linking research to policy and development in Nigeria. The characteristics of an efficient and effective agricultural services examined includes ; use of subject matter specialists, motivation of staff, cost effective extension approaches, defined targets or clientele, flexibility and an efficient internal monitoring and evaluation component. Despite identified constraints and the prevailing economic realities, the ADPs REFILS approach has proved an integrated

development model in linking research to policy and development in Nigerian agribusiness. The target of REFILS is the small scale farmers (resource poor) who produce 90 percent of the food eaten in the country (Amusat, 2022) .

Agricultural extension activities in Nigeria in the pre-1970 era were solely the responsibility of regional/state ministries of agriculture and their concentration was on export crops to the utter neglect of food crops, livestock and fisheries. Nigeria entered a second era of extension approaches through the intervention of the federal govemment in the 1970's. Several institutions or projects such as National Accelerated Food Production Project (NAFPP) were introduced to perform agricultural extension functions.

The Training and Visit (T and V) system of extension was formally introduced into the ADPs in 1986. The National Council for Agriculture (NCA) which is the highest agricultural policy body in Nigeria directed states to adopt the Unified Agricultural Extension Services (UAES) approach in their extension service delivery system in 1990.

Successive governments in Nigeria and their relevant agencies have been making efforts to improve agricultural extension service in the country. Some methods or strategies that were found useful and workable in other countries were Introduced to improve the effectiveness of extension services in Nigeria. The REFILS strategy was initiated in order to minimize or eliminate identified constraints such as linear information flow, basic and upstream research, low adoption of technology, technology development without farmers' involvement and lack of feedback from farmers to research which affect effective research extension farmer linkages in the country.

In spite of these efforts, the capacity/performance of extension services has been generally low and unsatisfactory in the country (Olowogbon 2020). A thorough study of the constraints to effective REFILS which is a strategy for Improved extension services is required in Nigeria to address the problem of low adoption of maize technologies and poor extension delivery in the country.

Objectives

The objectives of the study are to:

1. identify personal characteristics of respondents in the study area
2. identify the enterprise characteristics of farmers in the study area
3. determine the respondents' preference for linkage methods employed in REFILS
4. ascertain the constraints to effective REFILS activities in the study area

METHODOLOGY

The study was conducted in Nigeria. In Nigeria there are six griculturl zones out of which 50% that is three agricultural zones were selected. (Northwest, North Central and Southwest) were purposively sampled because of intense REFILS activities in the selected zones. Furthermore, states where the zonal coordinating research institutes are domiciled were also selected from each zone. Kaduna was selected in Northwest, Niger in Northcentral while Oyo was selected in southwest. A multi-stage sampling procedure was used to select maize farmers for the study. The choice of maize farmers was premised on the fact that technologies have been generated and disseminated on maize crop since inception of REFILS in Nigeria. Active maize farmers were selected through Agricultural Development Programmes (ADPs) in the respective states. Finally, 71 , 65 and 61 maize farmers were selected for the study making a total of 198 respondents used in the study .

Primary data were collected from maize farmers on their personal and enterprise characteristics, their preference for linkage methods employed in REFILS and the constraints to effective REFILS activities in the study area. Respondents provided information on their age, sex, marital status, educational attainment, family size, income per year, family size, cropping system, source of finance, labour, inputs etcetera. Respondents indicated their preferred linkage options through through a 3 point scale of large extent, less extent and not at all. Score of 2.1.0 were preference for linkage methods employed in REFILS ascertain the constraints to effective REFILS activities in the study area awarded respectively. The options were later ranked based on their means. Constraints to effective REFILS was measured by presenting a list of possible constraints on REFILS to maize production. Respondents indicated the severity from thre items on the list provided. This was measured on a 3 point scale and scores of 0,1, and 2 were awarded .Mean was used in categorisng the constraint into high and low.

Data Analysis

Data were analyzed using descriptive statistics such as frequencies, percentages, means and standard deviation.

RESULTS AND DISCUSSION

Table 1 Distribution of farmers' personal characteristics

Variable	Total n= 198	
Age	F	%
≤ 30	10	5.1
31 – 40	41	20.7
41 – 50	118	59.6
51 – 60	23	11.6
> 60	6	3.0
Mean age	44.8±7.23	
Marital Status		
Single	4	2.0
Married	189	95.5
Divorced	2	1.0
Widowed	3	1.5
Total	198	100.0
Educational level		
No formal	74	37.4
Primary	35	17.7
Secondary	68	34.3
Tertiary	21	10.6
Total	198	100.0
Household size		
1 – 4	43	21.7
5 – 8	94	47.5
9 – 12	40	20.2
> 12	21	10.6
Mean		5.8
Total	198	100.0
Social groups		
Cooperative	82	41.5
Maize farmers' Association	98	49.5
Socio/Cultural Group	6	3.0
Religious Group	6	3.0
Age Group	6	3.0
Total	198	100.0

Source: Field survey 2025

Farmers' Personal Characteristics

The Table above reveals that (59.6%) of maize farmers were within the age bracket of 41-50 years. This is consistent with (Chete et al, 2025)who reported the age bracket of 41-50 years for most farmers in rain forest and guinea savannah agro ecological zones of Nigeria. This shows that most of the maize farmers were still in their active years, implying availability of physical strength and mental alertness in adopting improved agro technologies which is a core objective of Research Extension Farmers Input Linkage System (REFILS). Majority (95.5%) of the total maize farmers were married as shown in Table 1. This shows the importance of the institution of marriage in the study area.

Married persons are expected to be more averse to risk than unmarried individuals because of the fact that they may have family to cater for. Such risk aversions make people less likely to adopt technologies because of fear of experiencing failures from such ventures. The finding on maize farmers' educational attainment across in the study area show that 37.4% of the total maize farmers had no formal education while 34.3% were educated up to secondary level. On the whole, 62.6% of the respondents had education ranging from primary six to tertiary level. The level of education attained by farmers determines their ability to perceive, interpret and correctly determine actions that would possibly enhance their performance in farming activities. Education is an important variable that can enhance the effectiveness of farmer as a key stakeholder in the Research –Extension –Farmers – Input Linkage System for sustainable agricultural development. Of the total respondents, 47.5% had household size of between 5-8 persons, 21.7% had between 1-4 persons, 20.2% had between 9-12 persons, while 10.6% had more than 12 persons. The average family size was 5.8, which depicts a fairly large family. This has an implication on food security in terms of number of dependents relative to available resources and the availability of labour for farm work. The results of the survey reveal that farmers in the study area belonged to different associations or groups . The result revealed that a little below half of maize farmers in the study area (49.5%) were members of farmers' associations, followed by cooperative societies (41.5%). The need to forge a common front or come together as a group by maize farmers to access benefits from government or credits from financial institutions might have informed their joining or belonging to farmers' associations and cooperative societies. According to Amusat (2018), farmers' groups have been identified as a veritable tool for passing information to farmers.

Table 2 Distribution of farmers' enterprise characteristics

	F	%
Income (₦)		
≤ 100,000	34	17.2
100,000 – 300,000	71	35.9
300,001-500,000	72	36.4
500,001-700,000	10	5.1
Above 700,000	11	5.4
Mean	₦332,795.46	
Farm size		
< 1 hect	11	5.6
1 – 3 hect	92	46.5
4 – 6 hect	80	40.4
> 6 hect	15	7.5
Mean	3.54±3.27	
Farming experience	198	100
< 5 years	18	9
5 – 9 years	36	18.2
10 – 14 years	57	28.8
15 – 19 years	68	34.3
> 20 years	19	9.6
Mean	15.3 ±11.1	
Land acquisition		
Family	135	68.2
Hired/lease	23	11.6
Purchase	25	12.6
Government	4	2
Source of finance		
Family and friends	54	27.3
Savings	85	43
Loan from Banks	21	10.6
Loan from Cooperative	38	19.1
Source of labour		
Family labour	66	33.3
Hired labour	45	22.7
Family & Hired	87	44
Total	198	100

Source: Field survey,2025

Farmers' Enterprise Characteristics

The mean annual income for the maize farmers in the study area was ₦332,795.46. Income is an important variable which affects farmers' ability to embrace new technologies, access other livelihood assets and dictate the standard of living of farmers in his community. The result of the farm size possessed by maize farmers in the study area reveals that 46.5% of farmers possessed between 1-3 hectares, followed by 40.4% which possessed 4-6 hectares. Table 2 reveals that the highest percentage (34.3%) of the maize farmers in the study area possessed over 15-19 years of farming experience, while only 27.3% had below 10 years of farming experience. Generally, majority of maize farmers in the study area had reasonable years of farming experience to be able to comment on Research–Extension–Farmers–Inputs –Linkage System itself which commenced 29 years ago. Table 2 shows

that 68.2% of the maize farmers acquired their farmlands through family inheritance, while land acquisition through hired, outright purchase and lease/rent from government were 11.6%, 12.6% and 2.0% respectively. The data gathered on source of finance reveals that 43.0% of the respondents funded their maize enterprise through their own personal savings, while only negligible percentage (10.6%) obtained bank loans. Additionally, 19.1% of the respondents got a cooperative loan which is another source of financial support to farmers. Furthermore, Table 2 shows that less than half of the respondents (44.0%) engaged the combination of family and hired labour for their farm work, while 33.3% and 22.7% used family and hired labour , respectively. The total result on the type of maize planted shows that majority of farmers (86.2%) planted open pollinated (OP) maize due to some obvious advantages such as farmers' ability to save seed, required less input such as fertilizer and easy availability of the open pollinated type.

Table 3 Distribution of farmers' preference for linkage options

Linkage options	Mean	Rank
ADPs/Extension Agents	1.86±0.67	1st
Input Agents	0.51±0.23	6th
Farmers' Association	1.13±0.57	3rd
ICT / Internet	1.04±0.59	5th
Print	0.31±0.19	7th
Radio	1.30±0.43	2nd
Television	1.25±0.63	4th

Source: Field survey, 2025

Farmers' preference for linkage options in REFILS

Table 3 shows farmers' response to preference on linkage option in REFILS. Majority of the famers ranked ADPs/ Extension agents, radio and farmers association 1st, 2nd and 3rd respectively across the zones. This infers that maize farmers still believe in two-way communication process which offered immediate feedback to them. This shows that government needs to improve on extension farm family ratio (1:2000) which is very high and has been continuously criticised by stakeholders. Radio has been recognised for its outstanding qualities in mass communication. Apart from being an excellent medium for mobilization, and its capability of drawing the attention of its diverse audience to new ideas coupled with techniques and latest information requiring urgent public attention, it also has a wide coverage, relatively to both urban and rural populace . In the same vein, print, input agents and internet were ranked 7th, 6th and 5th, respectively across the zones. The cost of acquiring, inaccessibility and the

inadequate skill in the operation of ICT/Internet may likely be responsible for the reason why maize farmers did not prefer ICT/Internet among the linkage options. This finding is however in agreement with those of who had earlier reported that internet was costly and not available coupled with lack of relevant skills to explore its usefulne

Table 4 Distribution of farmers' constraints to effective REFILS in Nigeria

Constraints	Mean	Rank
Non-involvement in planning of REFILS workshop	1.6±0.7	2nd
Unavailability of inputs	1.5±0.6	4th
High cost of farm inputs	1.8±0.5	1st
Irregular farm visit by Extension agents	1.0±0.8	7th
Incessant transfer of Extension agents	0.8±0.7	8th
Inability of the extension agents to communicate in vernacular	0.7±0.7	10th
Inadequate mobility (transport facility) by farmers to attend REFILS programmes	1.2±0.8	6th
Inadequate credit sources	1.5±0.7	3rd
Extension teaching is monotonous	0.7±0.8	9th
Insufficient information on demonstration e.g. SPAT, MTP	1.3±0.8	5th

Source: Field survey, 2025.

Farmers' constraints to effective REFILS in Nigeria

Table 4 shows that high cost of farm inputs (1.8 ±0.5), non-involvement in planning of REFILS workshop (1.6±0.7) and inadequate credit sources (1.5±0.7) were ranked by farmers as 1st, 2nd and 3rd respectively as the most serious constraints to REFILS in the study area , while inability of extension agents to communicate in vernacular (1.2±0.8), extension teaching is monotonous (0.8±0.7) and incessant transfer of extension agents (0.7±0.7) were ranked 10th, 9th and 8th by farmers respectively as not constituting constraints to effectiveness of REFILS in Nigeria.

The importance of farm inputs cannot be over emphasized as it is obvious that any improved technology disseminated that is not backed up by available cognate inputs cannot bring about the desired improvement in farm productivity. With the problem of inadequate credits confronting farmers, it will be difficult even for a willing farmer to acquire necessary inputs to try new technology. According to Sulaimon,etal (2022), farmers are often reluctant to invest in newly introduced agricultural technology because of limited cash resources.

Majority of the extension agents are indigenes of the geographical area in which they operate as a result the inability of the extension agents to communicate in vernacular did not arise and was not a constraint as revealed by the study.

CONCLUSION AND RECOMMENDATION

The study concludes that respondents had one form of education or another, reasonable years of experience with majority cropping 1 -3 hectares of farmland. The linkage methods preferred by the respondents are ADPs/ Extension agents, radio and farmers' association, while farmers are mostly constrained by high cost of farm input, noninvolvement in planning of REFILS workshop and inadequate credit sources. Access to credit or finance in agriculture can be considered a game changer, it is therefore recommended that government at all levels in Nigeria should increase budgetary allocation to agriculture and enhance farmers' access to fund. The coordinator of REFILS in all the agricultural zones of the country should also try to harmonise pre workshop meetings in such a way that farmers would attend and be carried along.

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