



TOURING THE GAP BETWEEN EXTENSION AGENTS, EXTENSION STRATEGIES, CAPACITY BUILDING AND CONSTRAINTS OF RICE PRODUCTION IN AGRICULTURAL ZONE IN NIGER STATE, NIGERIA

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ABSTRACT

The study examined or assessed the gap between extension agents, extension strategies, capacity building and constraints of rice production in agricultural zone of Niger State, Nigeria. Multi-stage sampling technique was used in selecting 48 respondents. Data were collected through the administration of questionnaire and analyzed using descriptive statistics. The study found that a participatory approach is not fully decentralized in planning, monitoring and evaluation of the agricultural extension programs to meet the demand-driven services of the farmers in the study area. Moreover, there is a difference between the capacity building of the extension personnel and the constraints incurred in rice production. The capacity building is mostly focused on production and post-harvest of rice production, while having multitude of constraints in marketing as well. Therefore, it is recommended that a participatory approach must be fully promoted and the capacity building of extension personnel must be melded with the demand-driven needs of farmers in approaching the rice production issues. The study will be needful for extension agents, policymakers, researchers, educationists and stakeholders in Agriculture and non-Agricultural sectors so as to understand ways of increasing the quality and effectiveness of agricultural extension services to foster agricultural production.

Keywords: Capacity building, Constraints, Extension strategies, Extension services, Rice production.

INTRODUCTION

In many countries, extension services represent one such example of a formal institution that plays a critical role in supporting small-scale agriculture and in achieving national and household food security (Roseline *et al.*, 2021). Agricultural extension services have been shown to build farmers' agricultural knowledge and skills, disseminate new technology and change farmers' attitudes (Khalid *et al.*, 2021) as well as promote community development through human and social capital development, facilitate access to markets and work with farmers towards sustainable development goals (Khalid *et al.*, 2021) also observed that participation in agricultural extension programmes by farmers in Nigeria led to improved welfare through increases in farmers' income and household productivities. Dokochi *et al.* (2020) demonstrated the critical role of agricultural extension in promoting the adoption of soil improvement technologies, highlighting that access to extension services significantly enhanced the adoption of chemical fertilizers.

In the context of Agricultural production, agricultural extension has a responsibility to increase awareness of the best available local adaptations that can be used to increase Agricultural produce. Whilst existing studies demonstrate the significant role played by



extension services in promoting farmers' welfare and productivity and empowering them to address the constraints faced, significant knowledge gaps remain relating to the capacity building needs of extension officers themselves. Focus has been largely on supporting farmers to adapt, without empirically assessing how agricultural extension agents can be more effective. In relation to agricultural productivity, it is also unclear how extension capacity gaps feature in the wider landscape of factors that combine to create barriers to successful adaptation outcomes (Rafat *et al.*, 2021).

For agricultural extension agents to help smallholders to effective agricultural production and productivity, it is vital to understand the capacity building needs of the agricultural extension agents to fulfil this important mandate. Capacity building includes efforts to “generate knowledge, skills and expertise in order to enhance analytical capacity that may assist in increasing agricultural productivity and sustenance” (Danmusa 2020). This study aims to identify the touring gap between the extension agents, extension strategies and capacity building in order to support smallholding farmers to address their constraints in rice production. In the 1970s, extension evolved as a government policy response to the World Food Crisis when there was a need to boost the production of staple food crops (Danmusa, 2020). In general, the role of agricultural extension is educational, with agents providing and disseminating information to farmers, providing institutional support and helping meet their needs. Efforts have included the transfer of appropriate technologies (primarily for crop and livestock production systems) from central research units to smallholders (Yusuf, 2021). Different approaches have been used in delivering extension education to farmers around the world, including farmer-field schools, flyers, radio messages, and field demonstrations (FAO, 2019). The objectives of this research are to:

- i. Identify the demographical characteristics of agricultural extension agents in the study area
- ii. examine the capacity building needs of agricultural extension agents for effective communication in the study area
- iii. identify constraints faced by the farmers in the study area

MATERIALS AND METHODS

The Study Area

The research was carried out in Agricultural Zone I of Niger State with four (4) local government areas namely: Katcha, Gbako, Lavun, and Edati. It has an area of 9,015 square kilometers (3,936 sq mi) and a projected population of 6198, 80 as at 2021. (Niger State Bureau of Statistics 2021). About 75% of its land area is good for arable crops production (Niger State Geographical Information System, 2021). It is located within Latitudes 6–9°N and Longitudes 3 – 8°E) and with a growth rate of 2.3%. All the four Local Government experiences two distinct season dry and wet seasons with annual rainfall varying from 1,100mm in the Northern part to 1,600mm in the Southern parts. The average annual rainfall is about 1,400mm. The duration of the rainy season is approximately 180 days. The wet season usually begins in April/May to October, while the dry season starts from November to March. The maximum temperature of 29°C, average temperature of 22°C and minimum temperature of 26°C. The mean average temperature is around 32°C. Dry season commences in October (Niger State Geographical Information System, 2021). Most of the communities in the Local are predominantly agrarian. Cereal crops grown such as rice, millet, guinea corn and maize vegetables grown in the Local Government are, Spinach, Pumpkin, bitter leaf and water leaf leave. Tree crops grown are mango, citrus, coconut, cashew, banana and pawpaw. Other non-



agricultural activities engaged by the people include blacksmithing, leatherwork, mat and basket making and trading. Women on the other hand engaged in technical handicraft and trading.

Sampling Procedure

Multi-stage sampling technique was used in selecting respondents for the study. The first stage involved random selection of Agricultural zones I in the State. At the second stage, four (4) Local Government Areas (LGAs) was randomly selected, this is due to largest production of cereal crops. The third stage involved random selection of two (2) extension blocks from each of the LGAs. At the fourth stage, 10% of the extension agents were randomly selected from the sampling frame of each extension block. In all, a total of 48 extension agents were selected from the four LGAs as the sample size for the study.

Table 1: Distribution of extension agents across the four LGAs

LGAs	Extension Block		No of Extension Agents selected	
Lavun	i.	Gbade	i.	8
	ii.	Sosa	ii.	10
Katcha	i.	Badeggi	i.	7
	ii.	Evutagi	ii.	5
Gbako	i.	Legbozukurun	i.	4
	ii.	Etsuyisa	ii.	3
Edati	i.	Eshata	i.	5
	ii.	Tama	ii.	6
4		8		48

Source: Field survey, 2021



Table 2. Leading topics for touring participants' experiences of extension services

Questions	Prompt
How often do you receive training?	
What agricultural extension training did you attend?	Pest management, seed protection, disease control, product development, etc.
What strategies do you adopt for providing extension services in terms of planning, monitoring, evaluation, implementation and reporting in your extension block?	Top-down, bottom-up, farmers, extension, researchers, etc.
How do you disseminate agricultural services to farmers?	
Is training related to the issues faced by farmers?	
What are the production constraints that you need to address through extension services?	Labor shortages, wildlife conflicts, irrigation, etc.
What are the marketing constraints that you need to address through extension services?	A lack of market, inaccessibility of a market, etc.
What are the post-harvest constraints that you need to address through extension services?	Pest and diseases, value addition, etc.
What are the harvesting constraints that you need to address through extension services?	Pest and diseases, lack of harvesting facilities, etc.
What government support do you think farmers require?	Budget, capacity building, etc.
What supports from development partners do you think farmers require?	

Source: Field questionnaire, 2021

RESULTS AND DISCUSSION

Descriptive Characteristics of the Extension Agents

The descriptive variables of the extension agents are shown in Table 3. The males, with 83.6%, dominated their female counterparts with 16.4%. This result is in collaboration with (Roseline, *et al.*, 2021) who says that female extension agents are fewer in term of service delivery which affects the adoption of innovation. The mean age of the extension agents was 35 years, with an education level slightly skewed towards diploma qualification at 73.6%. The majority (83%) of the respondents had a medium level of knowledge and skills in cereal production and a mean of 10 years of experience in agricultural extension. The average household growing rice was 258. On average, 131 days were spent on rice activities by extension agents per year. While, with a mean of 20.7, most extension agents did not handle projects related to rice production, 57% of the extension agents had attained training in rice production at least more than once. This result is in line with (Tajudeen *et al.*, 2021) who says that effective and efficient training of extension agents on new innovations will increase the capacity building of such extension officers and promote the adoption of such innovation. Half of the extension agents (50.4%) have experience in extension service delivery especially on new skills and knowledge to disseminate to the farmers. This result commensurate with (Majidadi *et al.*, 2021) who says that experience in extension service delivery promotes extension agents' knowledge and skills for the adoption of new technologies by the farmers.



Table 3: Socio-extension attributes of the extension agents

Variable (n = 62)		Frequency	Percentage
Sex	Male	45	83.6
	Female	17	16.4
Age (mean = 35.39 years)	20-30	17	16.4
	31-40	28	67.2
	41-50	17	16.4
Education	Diploma	33	73.6
	Bachelor's degree	29	26.4
Knowledge and skills in rice production	Low	3	10.1
	Medium	57	82.9
	High	2	7.0
Households growing rice under extension block (mean = 257.6)	1-150	7	9.3
	151-300	31	70.0
	301-450	15	16.2
	above 450	9	4.2
Engage in activities related to rice production in a year (mean = 164.5).	1-120 days	40	65.5
	121-240 days	14	24.4
	141-364 days	8	10.1
Projects on rice production (mean=20.7)	Not at all	48	81.4
	At least one	9	12.9
	More than one	5	5.7
Training (mean = 20.7)	Not at all	22	33.7
	At least one	14	9.4
	More than one	26	56.9
Extension experience (mean = 12.32)	1-10 years	26	39.9
	11-20 years	30	50.4
	21-30 years	6	9.7

Source: Field survey, 2021

Agricultural Extension Capacity Building

As shown in Table 4, among various capacity buildings attended by the extension agents, majority (70%) of them mentioned that rice production was the main training attended. Pest and disease management and weed management accounted for about 30% and 20% of training, respectively. While post-harvest management contributed 15%, product development and water management accounted for about 12% each in overall training. The rest of the training is less than 10%.

In general, the most common training attended by extension workers is on rice production. This result is in collaboration with the submission of (Hadiza *et al.*, 2021) who find out that in any agricultural programme or project, staple crop production programmes are of higher participation by the farmers than the other programs. A case of FADAMA I, II and additional financing followed by post-harvest and marketing. Training regarding marketing lacks diversity, unlike production and post-harvest. This indicates a large gap in the acquisition of knowledge and skills that extension agents are intended to acquire in all dimensions of agricultural development. In order to provide extension services, the extension agents must receive adequate knowledge and skills from education, training, seminars, refresher courses, and available information sources. Accordingly, extensive in-service agricultural training is



needed to prepare extension employees to deal with farmers' expanding needs (Adegoke, 2020). According to (Mohammed, 2019) who noted that insufficient skills of extension agents hamper planning and implementation of participatory extension approaches with farmers. Similarly, a majority of the respondents had a low to medium level of knowledge and skills in overall rice production exacerbated by a low-capacity building in their entire extension profession period. This implies that extension knowledge dissemination is weak. It is evident from a study (Gilbert *et al.*, 2021) that extension training is crucial and has found that hands-on training has bolstered adoption rates of orchard management practices of farmers in Jos north LGA of Plateau State, Nigeria, resulting in higher yields and productivity. Thus, it is suggested that capacity building of the extension personnel must consider all aspects of cereal production- production, post-harvest, and marketing.

Table 4: Capacity building attended by the extension agents

Capacity building	Frequency	Percentage	Types
Rice production	24	60	+
Pest and diseases management	11	30.6	+, ++
Weed management	7	19.9	+
Post-harvest management	5	14.9	++
Product development	4	10	++
Water management	4	12	+
Cultivation methods	3	8.5	+
Seed selection	3	8.5	+
Plant protection	3	8.5	+
Soil nutrient management	2	5	+
Value addition	2	5	++, +++
Nursery management	2	5	+
Application of fertilizer	2	5	+
Threshing practices	1	2.5	++
Pollination management	1	2.5	+
Harvesting practices	1	2.5	++

Note: +Production; ++ post-harvest; +++Marketing

Source: Field survey, 2021

Constraints Faced by the Extension Agents in Rice Production

The labor shortage was the major production challenge accounting for 70% followed by the crop damages by the wildlife and pest and disease infestation each attributing to 17% and 13%, respectively as presented in Table 5. Labour shortages resulting in fallow lands, and human-wildlife conflicts (Khalid *et al.*, 2021). Although it is implausible for the extension to provide a direct human workforce, the provision of technical facilities, including farm machinery, will greatly reduce the labor shortage Wildlife conflict is rampant in rural areas, plummeting agricultural productivity in all phases of crop production, including cultivation, harvest, and post-harvest, as well as depredating domestic animals and harming livestock production. A score of studies (Khalid *et al.*, 2021) have noted that crop depredation and livestock predation in the study area, are common during cropping seasons, affecting livelihoods, causing economic losses, and threatening food security. Although electric fencing



provided by extensions (Adewale and Joseph, 2020), and self-initiated methods such as wooden fencing, scarecrows, and self-guarding of crops (Adewale and Joseph, 2020) are practiced as mitigating measures, human-wildlife conflict continues to be a serious challenge to agriculture farming. Extension must consider diverse methods in curbing human-wildlife conflicts, according to the agricultural systems and the place and the diversity of the extension services is required to reach out to different stakeholders and meet farmers' needs (Adewale and Joseph, 2020). The other pronounced challenge is the pest and disease infestation. Studies mention that pests and diseases are prevalent in rice production (Yusuf, 2020).

Table 5: Constraints faced by the extension agents in rice production

Constraints	Frequency	Percentage
Labour shortage	38	70
Crop damage by wild life	25	17
Infestation by pest and diseases	22	13

CONCLUSION AND RECOMMENDATIONS

This study examined the extension strategies adopted by the extension agents and touring the linkages between the extension training and the rice production challenges. The extension strategies providing the extension services was assessed in planning, monitoring, implementation, evaluation and reporting. The training of extension personnel is mostly dominated by rice production and post-harvest, where challenges are largely distributed among production, post-harvest, and marketing of the rice. This clearly shows the discrepancy between the capacity building given and the constraints faced in promoting extension services to promote rice production. Therefore, it is recommended that the methods of the provision of extension services be improved to ensure the quality and effectiveness of the extension services. The capacity building of extension personnel must consider all aspects of cereal production— production, post-harvest, and marketing. The training must focus on the most prominent challenges, upgrading the knowledge and skills of the extension personnel so as to adequately disseminate it to the farmers.

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