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### Participation of Rice Farmers in Research Outputs Dissemination Activities in Katcha Local Government Area, Niger State

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#### Abstract

*The study examined the level of rice farmers' participation in extension activities for disseminating research outputs, analysed perceptions of the relevance and effectiveness of research outputs disseminated, and identified constraints to the dissemination of research outputs by farmers. Quantitative data were obtained from 111 rice farmers through a multistage sampling procedure. Correlation analysis was used to test the relationship between constraints to dissemination and participation in research output dissemination. The results revealed that for relevance, the response with the highest mean was "addresses specific challenges" ( $\bar{x}=2.17\pm 0.96$ ). For effectiveness, the highest mean was recorded by "improved understanding of soil fertility and nutrient management" ( $\bar{x}=2.24\pm 1.02$ ). Respondents mostly participated in training ( $\bar{x}=3.94$ ) and group meetings ( $\bar{x}=3.87$ ). The main constraints to dissemination were low motivation ( $\bar{x}=3.73$ ) and poor communication of extension programme time ( $\bar{x}=3.73$ ). Low motivation ( $r=-0.96, p=0.00$ ) and inadequate number of farmers as extension agents ( $r=-0.14, p=0.04$ ) had a negative significant relationship with participation. The study recommended the decentralization of extension programmes to communities to enhance farmers' participation.*

**Keywords:** Rice farmers' participation, extension programmes, research outputs dissemination

#### Introduction

The overarching objective of agricultural extension programmes is to facilitate the adoption of new technologies, knowledge, skills, resources, and improved agricultural practices, to enhance the productivity of farmers (Bikuba and Kayunze, 2019). Agricultural extension services involve the provision of information and advisory services to influence agricultural practices and improve crop yields. In general, extension services take various forms such as training, workshops, and field

demonstrations. These activities are typically handled or coordinated by governmental agencies or bodies at various levels of intervention.

The practice of agricultural extension service delivery has undergone dynamic changes over the years. Specifically, there has been a paradigm shift from the conventional top-down method involving the designation of dedicated extension agents to advise farmers on the application of new agricultural techniques or adaptation strategies, to a more participatory model, which integrates farmers in the implementation of extension services. This participatory approach leverages farmers' role as change agents and utilizes their experiential skills and knowledge of the farming community to engender sustainable agricultural practices (Meanteaw et al., 2020).

Farmer-participating extensions are increasingly utilized to enhance agricultural practices and improve productivity (Jack *et. al.*, 2020). In the rice sector, participatory extension enables farmers to disseminate research outputs to boost rice production (Takahash *et. al.*, 2019). The scope of knowledge shared by rice farmers typically covers the adoption of new or improved technologies developed by agricultural research institutes, climate change adaptation and mitigation strategies, harvesting, and marketing approaches (Kommey and Fombad, 2023).

Traditionally, agricultural research institutes are tasked with the role of conducting research into agricultural problems and generating new technologies or innovations through research outputs for implementation by farmers to enhance farm productivity. The production of credible research evidence by these institutions has historically impacted agricultural practices in diverse areas such as improved seed varieties, inorganic chemicals, and climate smart agriculture (Jayne, 2023). However, this can only happen if these outputs are integrated into policy and practice, funnelled through extension activities, and shared with smallholder farmers who utilise them to solve existing problems (Ifeanyi-Obi and Asuquo, 2023).

The effectiveness of extension efforts and adoption of innovations from research outputs reflects the perceived value of the information, their appropriateness or relevance to farmers' needs and the effectiveness of the communication systems, Effectiveness of extension information is defined as its capacity to achieve its planned purpose or anticipated outcomes and relevance is conceived as the suitability and value of extension information (Danjumah *et al.*2024). Communication is facilitated and reinforced through farmers' participation in dissemination of agricultural practices and innovations. Therefore, it is necessary to assess the level of participation of rice farmers in research output extension activities in Katcha Local Government Area (LGA) of Niger State.

The broad objective of this study was to assess participation of rice farmers in research outputs dissemination activities in Katcha LGA of Niger State. The specific objectives were to analyse the perceptions of relevance and effectiveness of information disseminated by rice farmers; examine the level of farmers' participation in extension activities for disseminating research outputs; and identify the constraints faced by farmers in disseminating research output.

## **Methodology**

The study was conducted in Katcha LGA of Niger State. The LGA is one of the 25 in Niger State with headquarters at Katcha town (8° 03'7" N, 6° 04' E and 9° 29' N, 6° 028' E). It has a tropical climate characterized by seasonal rainfall, high temperature, high wind speed and humidity.

The study population comprises rice farmers in the LGA. Respondents were selected using a two-stage sampling procedure. Badeggi, Kambari, and Egbanti were purposively sampled due to intensive rice production and high agricultural research/extension activities within the areas. Twenty percent of rice farmers in each of the selected rice-growing communities (Badeggi 39, Kambari 38, Egbanti 34) was proportionately sampled using simple random sampling. A total of 111 respondents were selected.

A quantitative method of data collection was employed. Data were analysed using mean, standard deviation and correlation. To measure rice farmers' perception of the relevance and effectiveness of research outputs by farmers to fellow farmers, a five-point Likert scale of strongly agree, agree, undecided, disagree and strongly disagree was used. The responses were aggregated, and the mean was calculated.

Constraints were measured using a three-point Likert-type scale of severe constraint, mild constraint and not a constraint. The mean was calculated to determine the severity of the constraints. The level of participation was measured using a three-point Likert-type scale of often (more than ten times) participate (3), sometimes (three to ten times) participate (2) and rarely (once or twice) participate (1). The mean was obtained and used to categorize participation into low and high. A score below the mean indicates a low level of participation, while a score similar and/or above the mean depicts a high level of participation in research outputs dissemination. Correlation analysis was used to test the relationship between constraints to dissemination and participation in disseminating research outputs.

## **Results and Discussion**

### **Perception of Relevance and Effectiveness of Research Output Disseminated by Rice Farmers**

The extension farmers provided training on research findings related to improved rice varieties (FARO 42 & 44), application of fertilizers, organic manure, and use of integrated pest management practices. Table 1 shows the perception of relevance and effectiveness of research output disseminated by rice farmers. In the case of relevance, the responses with the high means "address specific challenges" ( $\bar{x}=2.17\pm 0.96$ ), "applicable to local context and conditions" ( $\bar{x}=2.00\pm 0.98$ ) and "practical and actionable" ( $\bar{x}=1.88\pm 0.78$ ). This indicates that the research outputs disseminated by farmers to other farmers were useful in solving certain challenges, suited to the rural environment where farming is taking place as well as applicable and implementable for their rice farming activities. Overall, the positive "relevance" perceptions reflect the usefulness of the research outputs disseminated to farmers' needs. Danjumah et al. (2024) reported that farmers perceived the extension information as relevant and effective in Ghana.

For effectiveness, the responses with the highest means were improved soil practices ( $\bar{x}=2.24\pm1.02$ ), optimization of water and irrigation ( $\bar{x}=2.16\pm0.72$ ), improved knowledge and skills ( $\bar{x}=1.98\pm0.80$ ), and increased awareness of innovative techniques ( $\bar{x}=1.97\pm0.75$ ). This suggests that the farmers perceived the research output disseminated by them to other farmers as effective in enhancing their understanding of their farm operations, exposing them to innovations, and helpful in fertility, nutrient, water, and irrigation management of their farms. Ejem et. al. (2023) affirmed that extension practices do not effectively spread innovations to farmers in rural communities, consistent with global best practices, due to heavy dependence on extension agents and unidirectional flow of information from research through extension officers to farmers.

**Table 1: Perception of relevance and effectiveness of research output disseminated by rice farmers**

Perceptions	$\bar{x}$	Std. Dev.
<b>Relevance</b>		
Addresses specific challenges	2.17	0.96
Applicable to local context and conditions	2.00	0.98
Practical and actionable	1.88	0.78
Overcome the common obstacles	1.85	0.77
Tackles environmental and sustainability challenges	1.84	0.75
Reflects current trends and issues	1.78	0.79
Supports the adoption of best practices	1.73	0.77
Highly relevant and valuable	1.70	0.78
<b>Effectiveness</b>		
Improved soil practices	2.24	1.02
Optimizes water and irrigation	2.16	0.72
Improved knowledge and skills	1.98	0.80
Increased awareness of innovative techniques	1.97	0.75
Increased awareness of innovative techniques	1.97	0.75
Influenced decision-making process	1.94	0.85
Impacted productivity and yields	1.87	0.92
Encouraged adoption of sustainable practices	1.81	0.76
Enhanced pest and disease management practices	1.74	0.75
Helpful in addressing specific challenges	1.73	0.75

Source: Field Data, 2023

### **Level of Participation in Research Output Dissemination Activities**

Table 2 displays the level of participation in research output dissemination by the farmers. A high level of participation was recorded for training ( $\bar{x} =3.94$ ), group meetings ( $\bar{x} =3.87$ ), land preparation ( $\bar{x} =3.79$ ), planting ( $\bar{x} =3.70$ ) and field demonstrations ( $\bar{x} =3.56$ ). The activities that recorded low participation were problem identification ( $\bar{x} =1.78$ ) and evaluation of technology ( $\bar{x} =1.53$ ).

**Table 2: Level of participation in research output dissemination activities**

Participation in research output activities	$\bar{x}$
Training	3.94
Group meetings	3.87
Land preparation	3.79
Planting	3.70
Field demonstrations	3.56
Seed selection	2.96
Pest and disease management	2.75
Water and irrigation management	2.73
Soil fertility and nutrient management	2.63
Post-harvest handling	2.54
Problem identification	1.78
Evaluation of technology	1.53

Source: Field Data, 2023

### Constraints Faced by Farmers in Disseminating Research Output

Table 3 presents the constraints faced by farmers in disseminating research outputs to other farmers. The most mentioned constraints were low motivation ( $\bar{x} = 3.73$ ), poor communication of extension programme time ( $\bar{x} = 3.58$ ), lack of equipment for field demonstration ( $\bar{x} = 3.56$ ) and distrust of information delivered ( $\bar{x} = 2.89$ ). Tafida et al. (2024) concluded that low motivation constrained extension service delivery in Kaduna State.

**Table 3: Constraints faced by farmers in disseminating research output**

Constraints	$\bar{x}$
Low motivation	3.73
Poor communication of extension programme time	3.58
Lack of equipment for field demonstration	3.56
Distrust of information	2.89
Poor knowledge sharing culture	2.75
Doubts about information sources	2.73
Inadequate number of farmers as extension agents	2.70

Source: Field Data, 2023

### Relationship between Constraints Faced by Farmers and their Participation in Disseminating Research Output

The inferential results reported in Table 4 showing the Pearson Product Moment (PPMC) analysis of the relationship between respondents' constraints and participation in disseminating research output, reveals that low motivation ( $r = -0.96$ ,  $p = 0.00$ ), poor communication of extension programme time ( $r = -0.02$ ,  $p = 0.05$ ) and inadequate number of farmers as extension agents ( $r = -0.14$ ,  $p = 0.04$ ) had a negative but significant relationship with farmers' participation in disseminating research output. Sennuga et. al. (2020) confirmed the extremely low extension agent to-farmers' ratios in Sub-Saharan African communities.

**Table 4: Relationship between constraints faced by farmers and their participation in disseminating research output**

Variable	N	R
Low motivation	111	-0.96*
Poor communication of extension programme time	111	-0.02
Lack of machinery/equipment for demonstration	111	-0.65*
Distrust of information provided	111	-0.47
Inadequate number of farmers as extension agents	111	-0.14*

\*Significant@  $p \leq 0.05$

## Conclusion and Recommendation

Rice farmers participated in the dissemination of research outputs in Katcha LGA of Niger State especially in trainings, group meetings, land preparations and field demonstrations. It is therefore recommended that extension programmes should be decentralised to the community level to enhance farmers' participation while farmers should be provided with requisite equipment and facilities to perform extension functions.

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