ASSESSMENT OF THE TRAINING NEEDS OF AGRICULTURAL EXTENSION PERSONNEL IN NORTHWESTERN NIGERIA.

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ABSTRACT

The study was carried out in Northwestern Nigeria. Multistage sampling procedure was used to select 306 respondents for the study. Primary data was collected via a structured questionnaire and Key Informant Interview (KII). Descriptive, and Kendall's W Test were employed to analyzed the data. Results on socio-economic and psychological characteristics revealed that the extension personnel had a mean age of 39.4 years and they were mostly (83.7%) male, (90.2%) were married, 77.8% held OND/HND qualifications, with an average of 15.8 years of schooling. The mean household size and working experiences are 4 persons per household and 7.3 years respectively. They had averaging 8 training sessions and had covered a mean of 7473 farm families. More than half (58.8%) specialized in agricultural extension, 62.1%) belonged to professional associations. A significant proportion (82%) came from farming families and seminars were the most attended training type (53.9%). Results revealed that the highest-priority training needs were knowing extension approaches (Mean Rank = 12.7), training on extension goal philosophy (Mean Rank = 13.1), knowing needs assessment tools (Mean Rank = 13.1) among others. Results on constraints faced among respondents revealed that too many jobs with different specializations (97.1%), lack of training and re-training (88.9%), unavailability of resources (75.2%), lack of funding (74.8%), disproportionate extension-farmer ratio (73.9%) and poor remuneration (72.5%) & Poor Attitude (62.1%) were the major constraints. It was concluded that addressing training need would significantly improve the effectiveness of agricultural extension services in the region. Therefore, it was recommended that there should be a continuous professional development, particularly in ICT skills, basic communication, and modern extension techniques, should be prioritized for extension personnel while government and non-governmental organizations should continue recruiting additional extension personnel to help reduce the current disproportionate extension-farmer ratio.

Key words: Northwest, Personnel. Training need

INTRODUCTION

Agricultural extension is an indispensable way for reaching farmers with required knowledge and advice they need to upgrade their livelihoods. Agricultural extension is also described as the system of diffusing the latest idea and methods to farming community in order to improve their conventional farming practices (Abbas et al, 2008) cited in Tafida et al,. 2021). Agricultural extension services facilitate the transfer of information, knowledge and innovations to farmers in order to improve their output and standard of living. It is therefore imperative to provide farmers with adequate knowledge and information in the right place and at right time (Sadia & Abdul, 2016; Sanga, Kalungwizi & Msuya, 2013; cited in Tafida et al., 2021).

In 1974, the Agricultural Development Projects (ADPs) was institutionalized in Nigeria with funding assistance from the World Bank, Federal Government and State Governments (Omoregbe & Ajayi, 2009). The ADPs worked in the areas of improving agricultural services and human development. The agricultural extension personnel are those who examine the problems of the farmers and rural people and bring back to them a suitable solution to such problem (Safdar, 2005). However, the State's ADPs are now dormant due to lack of funds, even though the structure in terms of building assets; few personnel, serviceable vehicles, equipment, are still available but mostly in poor shape in most states (Federal

Ministry of Agriculture and Food Security (FMAFS) & United State Agency for International Development (USAID, 2023).

For a successful and effective extension personnel's job, there is need for extension personnel to be well-trained and competent in their jobs and these call for a continuous in-service training that will assist them in effective agricultural programme implementation and through extension service delivery.

Thus, this research work is aimed to find out the training needs and competency level of the extension staff in the zone for better recommendations.

METHODOLOGY

Description of the Study Area

North-West Nigeria comprises of seven states, namely, Sokoto, Kebbi, Zamfara, Katsina, Kaduna, Kano and Jigawa States. The Zone occupies a land mass of about 214,395 km and it lies between longitude 12° 10′ North and latitude 6° 15′ East (Eze et al, 2014). Based on the 2023 Cadre Harmonize Analysis for Nutrition Food and Nutrition Security in the Sahel, North-West Nigeria is the most populated geopolitical zone with 53,712,067 people.

The Zone experienced two climatic seasons; the wet season which lasts from April to October and the dry season which lasts from November till March (Eze et al, 2014). The dry season commences with harmattan, a dry chilly spell that lasts till February and is associated with lower temperatures. February to March is the hottest period of the year and temperature ranges from 33 to 41 °C (Eze et al., 2014). As regards rainfall distribution, the drier North-West zone has the Sahel savanna vegetation.The zone has relative advantage in respect to the use of e-resources in extension service delivery by the extension personnel as there are many mobile networks available.
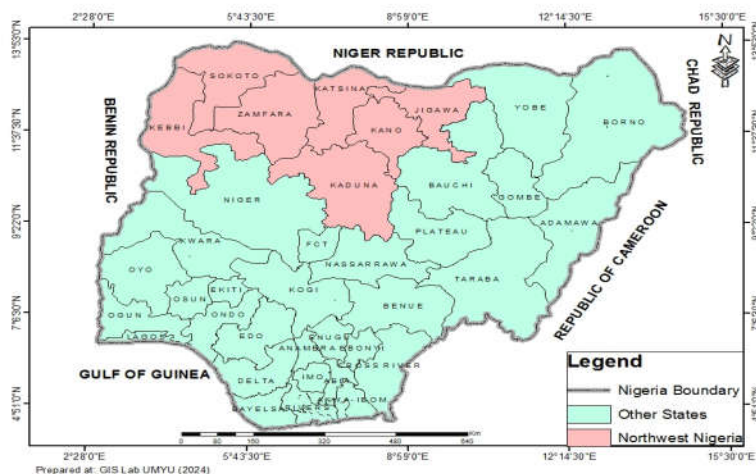

Fig.1: A map of Nigeria showing the Northwestern States

Sampling Procedure and Sample Size
This study targeted extension personnel in Northwestern Nigeria. Data obtained from various State ADPs suggests a total population of two thousand and ninety-one (2091) frontline extension agents across the study area. Multi-stage sampling was employed for extension agents' selection. First, three States (Katsina, Kano, and Zamfara) were chosen randomly. The second stage involved simple random selection of extension personnel within 8 ADP zones across the 3 chosen States. Raosoft sample size calculator was used to determine the sample size, employing a 5% margin of error and a 95% confidence interval. This was used to determine the number of extension personnel that were selected from each state (16 from Katsina, 256 from Kano, and 34 from Zamfara). The total sample size across the three (3) states stands at three hundred and six (306) respondents (Table 1). The third stage involves proportionate sampling of extension personnel from nine (8) ADP zones across the three (3) selected States.

Table 1: Population and sample size of extension personnel in the study area

States	Sampled states	Population of extension personnel	Procedure for sample size selection	Number of extension personnel selected (sample size)
Kaduna	Katsina	76	76/1431x304 = 17	16
Kano	Kano	1253	1253/1431x304 = 266	256
Katsina	Zamfara	169	169/1431x304 = 21	34
Kebbi				
Jigawa				
Sokoto				
Zamfara				
Total = 7	**3**	**1498**		**306**

*Reconnaissance survey, KTARDA, KNARDA, and ZARDA, March 2024

Data Collection

Data was collected through the review of relevant literatures and using structured questionnaires. The questionnaire was pretested to check for its appropriateness and correctness in generating all the necessary information to meet the objective of the research. The information collected include; socio-economic characteristics of the respondents, their training needs and constraints faced by extension personnel. Qualitative data was also collected using in-depth interview with key Informants to triangulate the quantitative information collected using questionnaire

Validity of Research Instrument

The Instrument for data collection was subjected to both face and content validity. Face validity was carried out with the assistance of experts in the field of agricultural extension and rural development. This was achieved by seeking the opinions of the experts on the representativeness and adequateness of items designed to measure the various variables of the study. This procedure had assisted in developing items that cover the objectives and capture the content that was assessed in the study. Multi-stage approach was employed in establishing the validity of the research instrument (DeVellis, 2017). This process is crucial in quantitative research, as validity refers to the extent to which the instrument measures the intended concepts (Polit and Beck, 2017). First, experts reviewed the instrument items for content and face validity. Content validity ensures the items comprehensively capture the target constructs, while face validity assesses their clarity and appropriateness for the target population (Polit and Beck, 2017). Following expert review, a pretest was conducted to further refine the instrument and enhance its validity. Finally, the experts' approval assured the instrument's suitability for the research objectives.

Pretesting of the Research Instrument

The instrument was pretested at Jigawa State which is not among the selected States. It was administered to 10% of the intended target population (≈30).

Reliability of the Research Instrument

To ensure the data collection instrument possess the necessary level of reliability and adequately address the research objectives, a thorough analysis of their internal consistency was conducted using split-half method. This method assesses the consistency of scores obtained by dividing the instrument into two halves and calculating the correlation between them. A reliability coefficient of 0.87 was found which indicates a high level of internal consistency as suggested by Kuder and Richardson (1937) and Reale and Twycross (2015), meaning the instrument will yield consistent results across administration.

Measurement of Variables
Dependent Variables

Dependent variables in this study refers training need which refers to the knowledge, skills, and abilities (KSAs) related to extension service delivery required in discharging responsibilities. This encompasses a strong understanding of the principles behind core competency and the ability applies them effectively (FAO, 2016). Competency/training need on extension service delivery covers various techniques across different domains. Agric Extension personnel were asked to rate their self-perceived level of knowledge on 27 specific areas of extension using a Likert type scale with very low (1), low (2), medium (3), high (4), and very high (5). Training needs were measured by asking the respondents to respond appropriately with either YES or NO as to whether they need training or not on each one of the 27 specific KSA that every extension personnel ought to have possessed. Data collected was analyzed using the Statistical Package for Social Scientist (SPSS 20) and finally some perceived constraints were listed and the extension personnel indicated those that they felt as constraints and those that were not.

Descriptive statistics (frequencies, percentages, mean and standard deviation) was used to summarize the data.

Independent Variables

Age: It refers to the chronological age of the extension personnel since their last birthday. It was measured in years. It is expected to influence competency among extension personnel negatively.

Sex: Extension personnel will be asked to indicate their sex which will if male be coded 1, or female, will be coded 0. It is expected to influence competency among extension personnel negatively for female and positively for male folk.

Marital Status: Marital status refers to a person's legal and social relationship to marriage, including single, married, divorced, widowed, and so on. Extension agents will be asked to indicate their status on the following scales: married (1) and (0) if otherwise. It is expected to influence competency among extension personnel positively for married ones.

Household size refers to the total number of people living in a single dwelling unit. Extension agents will be asked to indicate the number of people that reside with them and with whom they share foods and other basic household utilities. It is expected to influence competency usage among extension personnel positively

Educational qualification refers to the level of formal education a person has attained. Extension personnel's literacy level will be measured on the scale of informal education (0), primary education (1), secondary education (2), and tertiary education (3). It is expected to influence competency among extension personnel positively.

Access to extension training refers to the level of active participation in extension training programmes. Extension personnel will be asked whether they have engaged in any

extension related training coded as 1 if engaged and 0 if otherwise. It is expected to influence competency among extension personnel positively.

Number of trainings acquired per year: this refers to total number of trainings received in a year. It is expected that the higher the training frequency the higher the competency possess by extension personnel

Years of experience as an extension agent refers to the total number of years an agent has been employed in a professional extension service role. It will be measured in years. Extension personnel will be asked to indicate how many years they have been in the extension service. It is expected to influence competency among extension personnel positively.

Family background refers to the status of the extension personnel in relation to his/her agricultural background. This may be categorized in to either farming family and will be scored 1 or non-farming family which will be scored 0. It is expected to positively influence competency among extension personnel from farming family.

Educational attainment refers to the educational level of completion by the extension personnel. This may be measured as primary school completion =1, secondary school completion =2, OND completion = 3, N.C.E/HND completion = 4, Bachelor Degree = 5, Masters = 6, and PhD = 7. It is expected to positively influence e-resources usage among extension personnel that attain high level of education.

Area of specialization refers to the agricultural field of study where the extension personnel studied in the tertiary institution or vocational training centre, the score will follow as thus: agronomy = 1, crop related = 2, animal related = 3, agricultural economics = 4 and agricultural extension = 5. It is expected to positively influence e-resources usage among extension personnel that studied agricultural extension.

Membership of professional association refers to the extension personnel belonging/affiliation with any agricultural related group/organization/association. He may be member and scored 1 or non-member, if he/she is not belonging to any association and will be scored 0. It is expected to positively influence e-resources usage among extension personnel belonging to their professional association.

Number of trainings obtained refers to the total number of trainings that extension personnel obtained in a year. It is expected to influence e-resources usage among extension personnel positively.

Type of training(s) acquired/undergone refers to the category of training undergone by the extension personnel. It is expected to influence e-resources usage among extension personnel positively.

Farmer/farm families covered currently refers to the total number of farmers or farm families the extension personnel is currently working with as far agricultural extension service delivery is concerned. It is going to be measured in number. It is expected to influence e-resources usage among extension personnel positively.

The thirteen (13) independent variables in the study are: age, gender, marital status, household size, years of formal education, educational qualification, specialty area, membership of professional association, experience in extension work, family background, number of trainings acquired, type of trainings, farmer/farm families covered.

DATA ANALYSIS

Data collected for the study were analyzed using both descriptive and inferential statistics. The descriptive statistics were used to described the socio- economic characteristics, a certain the knowledge, identify the training need and identify the constraints militating against realization of high competency among extension personnel in North western Nigeria. Kendall's W Test was used to identify the training need among respondents.

Model Specification
Kendall's W Coefficient of Concordance

$$W = \frac{12}{k^2(n^3-n)} \sum\nolimits_{j=1}^{n} \left(R_j^2 - \frac{R_j}{n}\right)$$

R_j = Sum of rank across raters

n = number of observation

$$T = \sum\nolimits_{j=1}^{n} \left(R_j^2 - \frac{R_j}{n}\right) = \text{total sum square}$$

W = coefficient of concordance

The chi-square approximation used to test hypothesis two (H_{02}) from the Kendall's W test is;

$X^2 = (K - 1) \times W$

RESULTS AND DISCUSSION
Socio-economics and psychological characteristics of extension personnel in Northwestern Nigeria

Age

Finding of this study revealed that 76.1% of the respondents were between the age range of 31-50 years with a mean age of 39.4 years. This implies that most of the personnel were in their active age. This is in line with the finding of Aja et al. (2024) who reported that agricultural extension personnel (AEP) in Imo and Ebonyi States, Nigeria were in their productive age. Similarly, the results shows that 83.7% of the respondents were male. This implies that extension work in the study area is dominated by male. This could be because of the common believe of the people that farming is a male driving profession. This agree with the finding of Aja et al. (2024), who posited that agricultural extension personnel (AEP) in Imo and Ebonyi States were mostly male.

The results revealed that 90.2% of the respondents were married. This indicate that, majority of the extension personnel could have the trust of their client as they live together with them. This is in line with the work of Uzoechi *et al.* (2022), who reported that most of the extension agents in Southeastern Nigeria were married. The results also revealed that 77.8% of the respondents had OND/HND with a mean year spent in school of 15.8 years. This is in line with the work of Uzoechi *et al.* (2022), who reported that Extension Agents in Southeastern, Nigeria were

highly educated. The results further revealed that 43.5% of the respondents had a household size ranging between 1-5 persons with a mean of 4 persons. This disagrees with the finding of Nwaogu and Akinbile (2018), who reported that most of the extension in the study area had a considerable large household size.

On work experience, results revealed that 32.7% of the respondents had working experience ranging between 6-10 years with a mean of 7.3 years. This implies that, the extension personnel in the study area had many years of work experience. This could be an indication of increase in level of extension service knowledge and competence. This is in line with the finding of Tafida *et al.* (2021) who reported that most of the extension workers in kano state had many years of working experience. The results further revealed that 33.3% of the respondents had attended training ranging between 6-10 times in their carrier with a mean training of 8 times. This implies that some of the extension personnel have attended training that could aid good performance at their job.

Tabel 2: Distribution of the respondents according to their socioeconomic characteristics (n=306)

Variables	Freq	Percent	Mean	Std. Dev
Age				
18-30	17	5.6		
31-50	223	76.1	39.4	8.02
51 above	56	18.3		
Gender				
Male	256	83.7		
Female	50	16.3		
Marital status				
Single	25	8.2		
Married	276	90.2		
Widow	4	1.3		
Divorced	1	0.3		
Level of education				
SSSC	40	13.1		
OND/HND	238	77.8		
B.Sc.	14	4.6		
M.Sc.	8	2.6		
PhD	6	2.0		
Years spent in school				
1-6	67	21.9		
7-12	53	17.3		
13-16	161	52.6	15.81	3.58
17 above	25	8.2		
Household size				
1-5	133	43.5	4	2.37
6-10	115	37.6		
11-15	45	14.7		
16 above	13	4.2		
Work experience				
1-5	20	6.5		
6-10	100	32.7	7.35	1.21
11-15	52	17		
16-20	69	22.5		
21 above	65	21.2		
Number of trainings attended				
1-5	6	2.0		
6-10	102	33.3	8.75	4.27
11-15	42	13.7		
16-20	88	28.8		
21 above	68	22.2		

Source: field survey, 2025

Psychological characteristics of extension personnel in Northwestern Nigeria

Result on of this research work on Transfer opportunity revealed that majority (68.3%) of the respondents had transfer opportunity. This implies that the work of extension personnel is made flexible to able to choose place of work that suit his current situation at a particular point in time. Movement of extension personnel from one community to another could also increase their knowledge of the profession which can transform into high work competence as they could be able to handle different situation and cope in diverse environment. Similarly, the results on advance education revealed that majority (82.4%) of the respondents had attended school beyond secondary education. This implies that education which provides knowledge and exposure in any field of profession was upheld by the extension personnel as they strive to keep updating their knowledge through advanced education. On the passion for agricultural profession results revealed that majority (98.4%) of the respondents had passion for agriculture. This implies that agriculture as a profession is becoming more lucrative and not seen as dirty job. Having extension personnel who had passion for their job indicates high commitment to the field and could promote good working environment and health competition, putting the interest of the job first.

Similarly, results on the significance of their job revealed that majority (98.7%) of the respondents indicated that their work as extension personnel is significance in their live. This implies that most of the extension personnel were contented with profession they have chosen and the work environment are favorable for them to carry out their responsibilities. This can contribute to motivation and job performance. The results further revealed that majority (98.7%) of the respondents had training opportunity. This implies that, most of the extension personnel were provided with avenues to increase their knowledge and skills about the profession through several training opportunity either from government or nongovernmental organizations. On the issue of recognition, the results revealed that majority (55.2%) of the respondents were recognized. This implies that most of the extension personnel in the study area were motivated and respected for their services to the farming community. This recognition could be from government or farmers associations who had gain much through extension services. Motivation gives workers energy to do more,

therefore from this finding, extension personnel in the study area could said to have zeal for the work.

The finding of this research on promotion revealed that majority (70.6%) of the respondents had regular promotion. This implies that majority of the extension personnel in the study area were promoted when due, this is another form of work motivation which could keep workers performance as their career advances. Since there is regular promotion, they are expected to perform better than those who were not promoted. On the respondents' attitude to farmers the

results revealed that, majority (82.7%) of the respondents had positive attitude towards farmers. This implies that, most of the extension personnel sees farmers not only as clients but as people who hold value for the betterment of the Nation and needs to be treated with respect. Creating a friendly environment would allow farmers to voice out their problem and trust the extension personnel to provide a solution, such environment makes adoption of innovation easy for the farmers with less work from the extension personnel.

On the Farmers perceived Satisfaction with salary results revealed that majority (73.5%) of the respondents were satisfied with their salary. This implies that most of the extension personnel were contented with their take home. This will create a fair environment for proper work ethics to prevails and there could be less corruption and marginalization in service delivery because if the salary is not satisfactory, extension personnel could turn to exploit farmers. The results further

revealed that majority (79.4%) of the respondents had a good work condition. This implies that the work environment for the extension personnel in the study area is stress free and flexible to enable them also to attend to their personal needs. This is an indication that the extension personnel could feel involved in the decision process of their work place which could promote a healthy team work. Similarly, the findings revealed that 40.2% of the respondents had a very good relationship with their coworkers. This promotes healthy competition and team work, this is an indication that, extension personnel from different location in the study area can easily be integrated to work together.

Table 4: Distribution of the respondents according to their psychological characteristics (n=306)

Variable	Frequency	Percentage
Transfer opportunity		
Yes	209	68.3
No	97	31.7
Advance education		
Yes	252	82.4
No	54	17.6
Passion for agricultural profession		
Yes	301	98.4
No	5	1.6
Job significant		
Yes	302	98.7
No	4	1.3
Training opportunity		
Yes	302	98.7
No	4	1.3
Recognition		
Recognized	169	55.2
Not recognized	137	44.8
Promotion		
None at al	34	11.1
Not regular	56	18.3
Regular	216	70.6
Attitude towards farmers		
Negative	53	17.3
Positive	253	82.7
Satisfaction with salary		
Not satisfied	81	26.5
Satisfied	225	73.5
Work condition		
Poor	27	8.8
Fair	36	11.8
Good	243	78.4
Relationship with coworkers		
Very poor	8	2.6
Poor	2	0.7
Good	107	35
Very good	123	40.2
Excellent	66	21.6

Source: field survey, 2025

Other Psychological characteristics of extension personnel in Northwestern Nigeria

Findings of this research work on relationship with farmers revealed that 29.2 of the respondents had an excellent relationship with farmers. This implies that extension personnel in the study area are trying their best to prioritize farmers satisfaction on their various service delivery.

When farmers feel save and trust their extension personnel covering their community, they will make the environment safe and healthy for collaboration with the extension personnel in charge. Similarly, findings on the Supervisor visits revealed that, all (100%) of the respondents were visited by their supervisors. This implies that extension work in the study area had check and balance system. Indicating that, the quest to promote farming technologies

and practices among various farming communities is not a one-man business. Supervision keeps extension personnel on their toes when there is target to meet, which could increase the efficiency of the entire extension system. The results further revealed that most (85.7%) of the

respondents were satisfied with the visits of their supervisors. This implies that there is a mutual relationship with both superior and subordinate, which is a sign of health work environment and team work. **(Table 5)**

Table 5: Distribution of the respondents according to their psychological characteristics (n=306)

Variable	Frequency	Percentage
Relationship with farmers		
Very poor	35	11.4
Poor	15	4.9
Good	87	28.4
Very good	80	26.1
Excellent	89	29.2
Supervisor visits		
Yes	306	100
No	-	-
Feedback on supervisor visits		
Bad	9	2.9
Fair	35	11.4
Satisfactory	262	85.7

Source: field survey, 2025

Knowledge Level of Extension Personnel on Agricultural Service Delivery

The finding of this research work on the knowledge levels of extension personnel in six key areas: Extension Planning, Implementation, Monitoring & Evaluation (M&E), Communication,

Subject atter, and ICT. The mean score and standard deviation indicate the extent to which extension personnel possess essential knowledge for effective service delivery.

The results on Extension Planning revealed that most respondents demonstrated medium to high knowledge levels in extension planning. The highest-rated aspect was being familiar with work plan rudiments (mean = 3.57), while the lowest-rated was being familiar with extension system goals (mean = 3.45 Medium). This implies that while extension personnel have a good grasp of planning fundamentals, further training may be needed in goal-setting and strategic alignment with extension objectives. Also results on Implementation revealed that respondents exhibited high knowledge in all five aspects, with teamwork (mean = 3.59) and training facilitation (mean = 3.71) scoring the highest. This implies that the high knowledge in implementation suggests that extension workers are well-equipped to engage with farmers and execute extension programs effectively.

More so, result on Monitoring & Evaluation (M&E) revealed that the knowledge level in M&E was medium across all four components, with the lowest being knowledge of report writing (mean= 3.18). Since M&E is crucial for assessing program impact, the moderate knowledge level highlights the need for training in data collection, analysis, and reporting. In

addition, result on Communication revealed that knowledge levels varied, with high scores for local social values (mean = 3.62), local jargon (mean = 3.51) and knowledge of the local calendar (mean = 3.53), but medium for basic communication skills (mean= 3.32). This implies that while personnel understand cultural and linguistic factors, improving general communication skills is essential for better knowledge transfer.

Furthermore, results on Subject Matter Knowledge revealed that knowledge of crop production (mean = 3.92), animal production (mean = 3.64), and soil management (mean = 3.59) was high. However, value chain approaches (mean = 3.45), agribusiness principles (mean = 3.45), and pest/disease management (mean = 3.42) received medium scores. This implies that while personnel are knowledgeable about production, they need more training in value chains and agribusiness to enhance agricultural commercialization and sustainability. Also, results on ICT Knowledge revealed that ICT knowledge was the weakest area, with all aspects scoring in the medium range. This implies that the limited ICT knowledge suggests the need for digital skills training to improve the use of modern tools for extension service delivery. In Overall, the results on Knowledge Level of extension personnel agricultural service delivery revealed that 90.8% of respondents fall within the high knowledge category implying that the majority of extension personnel are well-versed in key areas of agricultural service delivery. However, there are specific gaps in M&E, communication, agribusiness, and ICT that should be addressed through targeted training programs. This in line with the work of Akande *et al.* (2018), who investigated the knowledge of extension agents regarding the professionalization of extension services in southwest

Nigeria. Their study revealed significant disparities in the level of knowledge between public and private agents**. (Table 6)**

Table 6: Results on knowledge level of extension personnel on agricultural service delivery

Variables	Weighted score	Mean score	Std. Dev	Remark
Extension Planning				
Being familiar with extension system goal	1057	3.45	1.07	Medium
Knowing extension approaches	1068	4.49	0.98	Medium
knowing need assessment tools	1079	3.52	0.94	High
Being familiar with community resources	1067	3.48	1.00	Medium
familiar with work plan rudiments	1093	3.57	0.89	High
Implementation				
Knowing team work	1100	3.59	0.96	High
Knowledge of training facilitation	1134	3.71	0.95	High
Knowledge of extension ethics	1131	3.69	0.96	High
Knowledge of farmers' culture	1112	3.63	1.04	High
Knowledge of interest-based negotiation	1082	3.53	1.09	High
Monitoring and Evaluation				
Understanding the concept of M&E	992	3.24	0.95	Medium
Knowledge of data collection design	1024	3.36	0.98	Medium
Knowledge of data analysis method	1015	3.32	1.05	Medium
Knowledge of report writing	976	3.18	1.06	Medium
Communication				
Knowledge of local social values	1108	3.62	0.95	High
Knowledge of basic communication skills	1016	3.32	1.09	Medium
Knowledge of local jargons	1076	3.51	0.96	High
Knowledge of local calendar	1080	3.53	1.09	High
Subject Matter				
Knowledge of crop production	1200	3.92	0.90	High
Knowledge of animal production	1115	3.64	1.07	High
Knowledge of soil management	1101	3.59	1.08	High
Knowledge of value chain approaches	1057	3.45	1.15	Medium
Knowledge of agribusiness principles	1058	3.45	1.19	Medium
Knowledge of pest and diseases	1048	3.42	1.17	Medium
ICT				
Knowledge of ICT gadgets	931	3.04	1.23	Medium
Knowledge of ICT tools application	918	3.00	1.17	Medium
Knowledge of software	883	2.88	1.21	Medium
Knowledge Level of Agricultural Extension Personnel				
Knowledge level Knowledge category	Freq	percent		
Low 0.00-1.50	-	-		
Medium 1.51-2.50	28	9.2		
High 2.51-5.00	278	90.8		

Source: field survey, 2025 **1= very low, 2= low, 3= medium, 4=high, 5=very high**

Training Needs of Agricultural Extension Personnel in Northwestern Nigeria

Findings on the training needs of agricultural extension personnel across six key areas: Extension Planning, Implementation, Monitoring & Evaluation (M&E), Communication, Subject Matter, and ICT. The mean rank

indicates the priority of training needs, with lower-ranked variables representing higher-priority training needs. Kendall's W test was used to assess agreement among respondents regarding these rankings. A Kendall's W value of 0.624 indicates a moderate to strong level of agreement among extension personnel. The Chi-square value of 202.962 is statistically significant ($p < 0.01$), implies that the ranking result was not due to chance.

Result on Extension Planning revealed that the highest-priority training needs were: Knowing extension approaches (Mean Rank = 12.7), training on extension goal philosophy (Mean Rank = 13.1) and knowing need assessment tools (Mean Rank = 13.1). This implies that extension personnel recognize the importance of understanding extension approaches, goal-setting, and needs assessment, as these are critical for planning effective extension programs. Also, result on Implementation revealed that the higher-priority training need is Knowledge of extension ethics (Mean Rank = 14.9). This implies that personnel may already be familiar with teamwork and training facilitation, but further training on ethical practices in extension services is needed to ensure professionalism and trust in service delivery. Results on Monitoring and Evaluation (M&E) revealed that the most training need include; Knowledge of data collection design (Mean Rank = 13.2). Understanding the concept of M&E (Mean Rank = 13.5) and Knowledge of data analysis (Mean Rank = 13.5). This implies that Personnel require more training in data collection, analysis, and impact assessment

to improve evidence-based decision-making in extension programs.

In addition, result on Communication revealed that the highest training need was in knowledge of local social values (Mean Rank = 13.6) and local jargon (Rank = 13.6). This suggests that extension personnel value the cultural context of communication in agricultural extension and require further training in engaging with farmers effectively. Also, results on Subject Matter Knowledge revealed that the highest training needs include: Knowledge of soil management (Mean Rank = 14.6), Knowledge of value chain approaches (Mean Rank = 14.9) and Knowledge of crop production (Mean Rank = 14.9). This implies that there is a moderate need for subject matter training, particularly in soil management and agricultural value chains, which are crucial for sustainable farming and agribusiness development. Furthermore, the results on ICT Knowledge revealed that the most pressing ICT training needs were: Knowledge of ICT tools application (Mean Rank = 15.2) and Knowledge of software (Mean Rank = 14.8). This implies that ICT is a weak area among extension personnel, and more training is required in digital tools, data management, and software applications for modern agricultural extension services. This is in line with the findings of Chikaire *et al.* (2018), who investigated the training needs of extension workers in the Bauchi State Agricultural Development Programme, Nigeria. Their findings revealed a need for training in improved crop production practices, climate-smart agriculture, and communication skills. **(Table 7)**

Table7: Kendall's W Test result on training needs of agricultural extension personnel in Northwestern Nigeria

Variables	Freq.	Percent	Mean rank	Rank
Extension Planning				
Training on extension goal philosophy	271	88.6	13.1	2nd
Knowing extension approaches	281	91.8	12.7	1st
knowing need assessment tools	271	88.6	13.1	2nd
Being familiar with community resources	261	85.3	13.6	7th
familiar with work plan rudiments	255	83.5	13.8	12th
Implementation				
Knowing team work	244	79.7	14.3	17th
Knowledge of training facilitation	242	79.1	14.4	20th
Knowledge of extension ethics	229	74.8	14.9	24th
Knowledge of farmers' culture	249	81.4	14.1	16th
Knowledge of interest-based negotiation	245	80.1	14.3	17th
Monitoring and Evaluation				
Understanding the concept of M&E	262	85.6	13.5	5th
Knowledge of data collection design	270	88.2	13.2	4th
Knowledge of data analysis method	263	85.9	13.5	5th
Knowledge of report writing	257	84.0	13.7	10th
Communication				
Knowledge of local social values	261	85.3	13.6	7th
Knowledge of basic communication skills	258	84.3	13.7	10th
Knowledge of local jargons	260	85.0	13.6	7th
Knowledge of local calendar	245	801	14.3	17th
Subject Matter				
Knowledge of crop production	230	75.2	14.9	24th
Knowledge of animal production	255	83.5	13.8	12th
Knowledge of soil management	237	77.5	14.6	22nd
Knowledge of value chain approaches	232	75.8	14.9	24th
Knowledge of agribusiness principles	256	83.7	13.8	14th

Knowledge of pest and diseases	252	82.4	13.9	15th
ICT				
Knowledge of ICT gadgets	240	78.4	14.5	21st
Knowledge of ICT tools application	223	72.9	15.2	27th
Knowledge of software	234	76.5	14.8	23rd

Kendall's W = 0.624
Chi^2 = 202.962
Degree of freedom =26
Sig = 0.000

Source: field survey, 2025   Rater: 1= yes, 2= no

Constraints affecting Extension Personnel in Northwestern Nigeria.

The results on Constraints faced by extension personnel in discharging their duty highlight the major constraints to include: many jobs with different specializations expected (97.1%)., The expectation for personnel to handle diverse tasks reduces efficiency and weakens technical specialization, Lack of training and re-training (88.9%), without continuous skill improvement, personnel cannot keep up with new technologies, digital tools, and modern farming techniques,
Unavailability of resources (75.2%) & lack of funding (74.8%), Resource shortages (e.g., transport, demonstration materials, ICT tools) limit effectiveness, Disproportionate extension-farmer ratio (73.9%). Fewer personnel managing too many farmers lead to inefficient service delivery and farmer dissatisfaction, Poor remuneration (72.5%) & poor attitude (62.1%), Weak internet connectivity (70.6%). Affects access to digital extension tools, online training, and farmer advisory services. This finding aligns with the broader limitations identified by Nwaogu _et al._ (2017), Olorunfemi (2023), specifically highlighted limited access to training and workshops as a constraint hindering extension agents' competence in promoting climate-smart agricultural practices. Similar to the constraints identified by Nwaogu _et al._ (2017), Umar _et al._ (2019) pinpointed lack of training opportunities and inadequate supervision as factors hindering improvements in extension worker competency. **(Table 8)**

Table **8**: Results on the constraints militating against realization of high technical competency among extension personnel in Northwestern Nigeria.

Constraints	*Frequency	percentage
Lack regular training and re-training of extension personnel	272	88.9
Disproportionate extension-farmer ratio	226	73.9
Un availability of resources	230	75.2
Lack of funding for extension activities	229	74.8
Poor remuneration	222	72.5
Weak internet connectivity	216	70.6
Poor attitude of extension personnel towards the service	190	62.1
Too many jobs with different specializations expected	297	97.1

Source: field survey, 2025   *Multiple responses

CONCLUSION
From the finding of this study, it could be concluded that extension personnel possess medium to high knowledge in various areas of agricultural service delivery, but significant gaps in ICT knowledge and basic communication skills remain., several areas such as extension planning, monitoring & evaluation, and subject matter expertise, particularly in agribusiness and ICT, require improvement. Key constraints include inadequate training, resource shortages, high extension-farmer ratios, poor remuneration, and ineffective management. Extension Directors also highlighted that the extension system is hindered by bureaucratic delays, political interference, and a lack of regular training and resources. Addressing these challenges would significantly improve the effectiveness of agricultural extension services in the region.

RECOMMENDATIONS
Based on the findings of this study it is recommended:

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1. There should be a continuous professional development, particularly in ICT skills, basic communication, and modern extension techniques for both extension personnel and managers.

2. funding and other resources are to be made available for necessary tools and equipment, such as ICT gadgets, transportation, and demonstration materials.

3. Additional extension personnel should be employed to help reduce the current disproportionate extension-farmer ratio, enhancing service delivery and reducing workload challenges.

4. working conditions need be to improve.

5. Bureaucratic processes and political interference by government need to be reduce to tackle.

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