

LINGUISTIC TECHNIQUES OF EXTENSION WORKERS: FACILITATING AGRICULTURAL INNOVATION AMONG FARMERS IN POST-CONFLICT BORNO STATE, NIGERIA

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Abstract

Agricultural extension services serve as critical mechanisms for knowledge transfer and innovation dissemination in post-conflict reconstruction efforts. However, the specific linguistic strategies employed by extension agents to facilitate effective communication in conflict-affected contexts remain insufficiently explored. This study sets out to investigate the linguistic techniques employed by agricultural extension workers and to evaluate their effectiveness in promoting the adoption of agricultural innovations among farmers in Borno State - Nigeria, a region recovering from a protracted insurgency. Using a mixed-methods design, data were collected across six Local Government Areas through structured surveys with 100 farmers, semi-structured interviews with 30 extension workers, six focus group discussions, and 45 direct field observations. Qualitative data were analysed thematically, while quantitative data underwent descriptive, correlational, and regression analyses using SPSS. Findings reveal that linguistic adaptability (including code-switching, the use of culturally embedded metaphors, participatory narratives, and trust-enhancing rhetorical patterns) significantly enhances farmers' comprehension and engagement. Statistical analysis further confirms that language understanding, communication effectiveness, and trust are key predictors of innovation adoption. The study underscores the importance of linguistically and culturally responsive communication in strengthening agricultural extension outcomes in fragile post-conflict settings and provides policy-relevant insights for improving extension training and program design.

Keywords: Agricultural extension, linguistic strategies, innovation adoption, post-conflict communication, Borno State, Nigeria

1. Introduction

Agriculture constitutes a cornerstone of economic development and food security in many developing nations, with approximately 70–80% of Nigeria's population engaged in farming activities (Ogundiran, 2013). However, in Borno State, years of violent conflict have disrupted agricultural systems, displaced rural populations, and eroded institutional support mechanisms critical for food production. As reconstruction efforts gain

momentum, agricultural extension services are positioned as vital conduits for rehabilitating the sector by facilitating the transfer of improved agricultural technologies and practices to farmers.

Agricultural extension serves to bridge the knowledge gap between research institutions and farming communities by providing timely, context-appropriate information, training, and support. Yet, the effectiveness of these services is highly contingent upon the quality of

communication between extension workers and farmers. In post-conflict contexts, where trust in institutions is diminished and sociocultural dynamics are volatile, communication must extend beyond the transmission of technical content. Extension workers must engage in linguistically strategic and culturally sensitive communication that fosters trust, addresses trauma, and encourages behavioural change. Despite broad acknowledgment of communication's centrality to successful agricultural extension, limited empirical research exists on the specific linguistic techniques employed by extension personnel, particularly within post-conflict environments. The breakdown of social capital, the presence of psychological trauma, and the fragility of local institutions pose unique challenges that necessitate a rethinking of extension communication frameworks.

This study aims to fill that gap by systematically analysing the linguistic strategies utilized by extension workers in Borno State and evaluating their effectiveness in enhancing farmer comprehension, trust, and adoption of agricultural innovations. Through this inquiry, the research seeks to contribute to the development of evidence-based training programs for extension professionals and to inform policy interventions geared toward post-conflict agricultural development.

2. Literature Review

2.1 Communication in Agricultural Extension

Effective communication is foundational to the success of agricultural extension. It facilitates not merely the dissemination of information but the construction of shared understanding and the motivation of behavioural change (Van Den Ban & Hawkins, 1996). As extension services evolve from top-down models to participatory frameworks, the communicative role of extension workers has become increasingly complex. They must tailor messages to diverse audiences, engage interactively with farmers, and translate technical

jargon into accessible discourse. The centrality of communication in innovation diffusion is underscored by Rogers (2003), who emphasizes that the mode and quality of information exchange critically influence the adoption trajectory of agricultural technologies.

2.2 Linguistic Techniques in Extension Services

Linguistic techniques refer to the deliberate use of language features, such as tone, diction, metaphor, narrative structure, code-switching, and local idioms, to enhance message clarity, engagement, and credibility. In multilingual and culturally heterogeneous settings, these techniques are not ancillary but essential. Existing empirical studies shows the effectiveness of using local languages and culturally embedded metaphors in enhancing information retention and promoting behavioural change. For instance, Aker (2011) found that tailoring communication to local vernacular and interactive formats significantly improved knowledge transfer in Niger, while Bentley et al. (2007) documented the effectiveness of localized, narrative-based messaging in Ugandan extension programs.

2.3 Innovation Adoption in Agricultural Contexts

The decision to adopt an agricultural innovation is a function of multiple, intersecting variables, including perceived relative advantage, compatibility with existing practices, complexity, trialability, and observability (Rogers, 2003). Communication plays a central role in shaping these perceptions. Social cognitive theory (Bandura, 1986) further suggests that individuals learn through observation, imitation, and modelling (underscoring the importance of demonstrative and participatory communication). Thus, the linguistic framing of innovation; how it is described, contextualized, and justified, can significantly influence farmer receptivity and eventual adoption.

2.4 Communication Challenges in Post-Conflict Settings

Post-conflict environments are marked by psychosocial fragility, institutional dislocation, and cultural volatility. In such contexts, traditional communication pathways may be disrupted, while

trust in authority figures and external agents is often eroded (Colletta & Cullen, 2000). Extension workers must therefore operate not just as technical advisors but as trust brokers and cultural mediators. Bauman (2009) argues that rebuilding community trust requires not only content expertise but communicative sensitivity; extension workers must listen deeply, speak respectfully, and engage empathetically with affected populations.

2.5 Cultural and Contextual Considerations

Cultural sensitivity in extension communication entails more than language translation; it involves aligning messages with local epistemologies, norms, and practices. Participatory communication strategies that invite farmer input and incorporate indigenous knowledge have been shown to increase innovation adoption (Pretty & Chambers, 2003). Using locally understood metaphors, stories, and analogies can ground new information in familiar cognitive and cultural frameworks, thereby reducing resistance and enhancing comprehension.

2.6 Empirical Gaps and the Nigerian Context

While general communication frameworks for agricultural extension are well-established, research that interrogates specific linguistic techniques within fragile, post-conflict settings remains scarce. In the context of Borno State, Adebayo et al. (2016) emphasize the importance of consistent and transparent communication in restoring community trust. However, there is limited empirical analysis of the specific language practices that foster trust, clarity, and adoption among farmers. This gap is particularly pressing given the linguistic diversity and sociopolitical complexity of northern Nigeria.

2.7 Theoretical Framework

This study is grounded in a multidisciplinary theoretical framework combining:

- **Diffusion of Innovation Theory (Rogers, 2003):** Offers a lens for understanding how innovation communication influences adoption stages, from knowledge and persuasion to decision and confirmation. It highlights the

importance of perceived innovation attributes and the role of communication in shaping these perceptions.

- **Speech Acts Theory (Austin, 1962; Searle, 1969):** Provides a micro-linguistic framework for analysing how language performs actions. It distinguishes between locutionary (utterance), illocutionary (intent), and perlocutionary (effect) speech acts, critical for understanding how extension workers persuade, motivate, and reassure.

- **Social Network Theory (Granovetter, 1973):** Recognizes the centrality of social ties and informal networks in information dissemination. In disrupted post-conflict systems, understanding these networks is essential for rebuilding communication infrastructure.

- **Trauma-Informed Communication (SAMHSA, 2014):** Emphasizes communication strategies that account for the emotional and psychological states of conflict-affected populations. It advocates for transparency, empathy, and consistency to create safe and supportive learning environments.

This integrated framework enables a nuanced analysis of how language functions not just as a medium of communication but as a mechanism of behavioural change, social repair, and community resilience.

3. Methodology

3.1 Research Design

This study employed a convergent parallel mixed-methods design, integrating quantitative and qualitative approaches to comprehensively investigate the linguistic techniques used by agricultural extension workers in post-conflict Borno State. The combination of structured surveys and in-depth qualitative methods enabled triangulation of findings and facilitated a richer interpretation of both measurable patterns and contextual nuances.

3.2 Study Area

The research was carried out in six Local Government Areas (LGAs) across Borno State, which were purposively selected to reflect both

geographic diversity and the varying stages of post-conflict recovery. From the Borno Central Zone, Maiduguri and Konduga were included; from the Borno South Zone, the LGAs of Biu and Shani were selected; and from the Borno North Zone, Abadam and Dikwa were chosen. This stratification ensured a representative sample of the state's demographic, linguistic, and recovery profiles.

3.3 Population and Sampling

The study focused on two primary groups of participants. The first group comprised 30 extension workers, each with a minimum of two years of experience in the region and active involvement in farmer training programs. The second group consisted of 100 farmers who had engaged with extension services within the preceding two years. Participants were selected through purposive sampling based on their relevance, availability, and willingness to provide informed insights.

3.4 Data Collection Methods

Quantitative Data

Structured surveys were administered to 100 farmers to gather data on several key areas. These included their perceptions of the effectiveness of communication with extension workers, the frequency and quality of their interactions, their language preferences and levels of comprehension, as well as the rates at which they adopted agricultural innovations and the factors that influenced these decisions.

Qualitative Data

- **Semi-Structured Interviews (n = 30):** Explored extension workers' communication strategies, challenges, and adaptive linguistic practices.
- **Focus Group Discussions (n = 6):** Conducted with farmers to elicit collective views on communication effectiveness, cultural alignment, and adoption decisions.
- **Field Observations (n = 45):** Systematically documented real-time extension sessions, capturing verbal and non-verbal communication, participation levels, and contextual variables.

3.5 Data Analysis

Qualitative Analysis

Transcripts from interviews, discussions, and observations were analysed using Braun and Clarke's (2006) six-phase thematic analysis framework. NVivo software was used to organize and code data, identify themes, and generate illustrative quotes.

Quantitative Analysis

Survey data were analysed using SPSS Version 26. The following statistical techniques were applied:

- **Descriptive statistics:** To summarize demographics, communication preferences, and adoption behaviour.
- **Correlation analysis:** To explore associations between communication variables and innovation adoption.
- **Multiple regression analysis:** To identify significant predictors of innovation adoption.

3.6 Ethical Considerations

Ethical clearance was obtained from the Institutional Research and Development Board of Nigerian Army University Biu. All participants provided informed consent. Anonymity and confidentiality were assured, and participants retained the right to withdraw without penalty. Data were stored securely in accordance with research ethics guidelines.

4. Data Presentation and Analysis

This section presents the findings of a mixed-methods study that investigated the linguistic techniques employed by agricultural extension workers in post-conflict Borno State, Nigeria. Data were collected from 100 farmers, 30 extension workers, 6 focus group discussions, and 45 field observations across six Local Government Areas. The analysis utilized both descriptive and inferential statistics for quantitative data, while qualitative data underwent thematic analysis.

4.1 Response Rate and Demographic Characteristics

Response Rate

The study achieved a 100% response rate across all data collection instruments:

- Farmer surveys: 100/100 (100%)
- Extension worker interviews: 30/30 (100%)

- Focus group discussions: 6/6 (100% with 8-12 participants each)
- Field observations: 45/45 (100%)

Demographic Profile of Farmers

Table 4.1 provides the demographic characteristics of the 100 farmer respondents (N=100). The majority of farmers were male (73.0%) and aged

between 31-45 years (41.0%). A significant portion had no formal education (34.0%) or only primary education (38.0%). Most farmers had 11-20 years of farming experience (35.0%) and managed 1-5 hectares of land (67.0%). Hausa was the primary language for 45.0% of farmers, followed by Kanuri at 32.0%.

Table 4.1: Demographic Characteristics of Farmer Respondents (N=100)

Characteristic	Category	Frequency	Percentage
Gender	Male	73	73.0
	Female	27	27.0
Age Groups	18-30 years	22	22.0
	31-45 years	41	41.0
	46-60 years	28	28.0
	Above 60 years	9	9.0
Education Level	No formal education	34	34.0
	Primary	38	38.0
	Secondary	23	23.0
	Tertiary	5	5.0
Farming Experience	1-10 years	28	28.0
	11-20 years	35	35.0
	21-30 years	24	24.0
	Above 30 years	13	13.0
Farm Size	1-5 hectares	67	67.0
	6-10 hectares	23	23.0
	Above 10 hectares	10	10.0
Primary Language	Hausa	45	45.0
	Kanuri	32	32.0
	Arabic	15	15.0
	English	3	3.0
	Local dialect	5	5.0

Demographic Profile of Extension Workers

Table 4.2 presents the demographic characteristics of the 30 extension workers (N=30). The majority were male (73.3%) and fell within the 36-45 years age group (43.3%). A significant proportion held a Bachelor's degree (60.0%). Most extension workers had 6-10 years of experience (40.0%) and spoke 4-5 languages (60.0%).

Table 4.2: Demographic Characteristics of Extension Workers (N=30)

Characteristic	Category	Frequency	Percentage
Gender	Male	22	73.3
	Female	8	26.7
Age Groups	25-35 years	12	40.0
	36-45 years	13	43.3
	46-55 years	5	16.7
Education Level	Diploma	8	26.7
	Bachelor's degree	18	60.0
	Master's degree	4	13.3
Experience	2-5 years	11	36.7
	6-10 years	12	40.0
	Above 10 years	7	23.3
Languages Spoken	2-3 languages	8	26.7
	4-5 languages	18	60.0
	Above 5 languages	4	13.3

Findings:

The study achieved a 100% response rate across all data collection instruments, indicating robust data collection. The demographic profile of farmers revealed a predominantly male farming population (73.0%) with a significant proportion having no formal education (34.0%) or only primary education (38.0%). This highlights the necessity for communication strategies that do not heavily rely on literacy. The extension workers themselves were largely male (73.3%) and well-educated, with 60.0% holding a Bachelor's degree. Critically, 60.0% of extension workers spoke 4-5 languages, suggesting a strong linguistic capacity to engage with diverse farmer populations.

4.2 Extension Service Interaction Patterns

Frequency of Farmer-Extension Worker Interactions

Table 4.3 details the reported frequency of extension service interactions among farmers (N=100). The most common interaction frequency was monthly (42.0%), followed by quarterly (28.0%).

Table 4.3: Frequency of Extension Service Interactions (N=100)

Frequency	Number of Farmers	Percentage
Weekly	15	15.0
Monthly	42	42.0
Quarterly	28	28.0
Rarely	13	13.0
Never	2	2.0

Primary Sources of Agricultural Information

As shown in Table 4.4, extension workers were the primary source of agricultural information for 48.0% of farmers (N=100). Fellow farmers (23.0%) and radio (15.0%) were also significant sources.

Table 4.4: Primary Sources of Agricultural Information (N=100)

Information Source	Frequency	Percentage
Extension workers	48	48.0
Fellow farmers	23	23.0
Radio	15	15.0
Market vendors	8	8.0
Television	4	4.0
Others	2	2.0

Findings:

Monthly interactions were the most common frequency of farmer-extension worker engagement (42.0%). This regular, albeit not weekly, contact allows for consistent knowledge transfer. The centrality of extension workers as a primary source of agricultural information (48.0%) underscores their crucial role in the agricultural landscape of Borno State, surpassing fellow farmers (23.0%) and radio (15.0%). This indicates that direct, interpersonal communication from extension workers is highly valued by farmers.

4.3 Language Use and Communication Effectiveness

Language Preferences in Extension Communication

Table 4.5 illustrates the languages used by extension workers in communication with farmers (N=100). Mixed languages were most frequently employed (52.0%), followed by Hausa only (28.0%).

Table 4.5: Languages Used by Extension Workers in Communication (N=100)

Language	Frequency	Percentage
Mixed languages	52	52.0
Hausa only	28	28.0
Local dialect only	12	12.0
English only	5	5.0
Arabic only	3	3.0

Farmer Understanding Levels by Language

Farmer understanding levels by communication language are presented in Table 4.6 (N=100). Communication in local dialect yielded the highest mean understanding score (3.26), with 48% of farmers reporting excellent understanding. Mixed languages also showed a high mean score of 3.17, while English had the lowest mean score (1.86), with 45% reporting poor understanding. The understanding levels were scored on a scale where Excellent = 4, Good = 3, Fair = 2, and Poor = 1.

Table 4.6: Farmer Understanding Levels by Communication Language (N=100)

Language	Excellent	Good	Fair	Poor	Mean Score*
Local dialect	48%	35%	12%	5%	3.26
Hausa	35%	42%	18%	5%	3.07
English	8%	15%	32%	45%	1.86
Mixed languages	42%	38%	15%	5%	3.17

*Scale: Excellent = 4, Good = 3, Fair = 2, Poor = 1

Communication Method Effectiveness

Table 4.7 assesses the effectiveness of communication methods used by extension workers (N=100). Demonstrations were perceived as the most effective method with a mean score of 4.21, with 45% rated as "Very Effective". Individual consultations (mean score 4.02) and group discussions (mean score 3.94) also showed high effectiveness. Printed materials had the lowest mean score of 2.98, with 25% deemed "Ineffective" and 12% "Very Ineffective". The effectiveness scale was Very Effective = 5, Effective = 4, Neutral = 3, Ineffective = 2, and Very Ineffective = 1.

Table 4.7: Effectiveness of Communication Methods Used by Extension Workers (N=100)

Method	Very Effective	Effective	Neutral	Ineffective	Very Ineffective	Mean Score*
Demonstrations	45%	38%	12%	3%	2%	4.21
Group discussions	32%	41%	18%	7%	2%	3.94
Individual consultations	38%	35%	20%	5%	2%	4.02
Printed materials	12%	23%	28%	25%	12%	2.98

*Scale: Very Effective = 5, Effective = 4, Neutral = 3, Ineffective = 2, Very Ineffective = 1

Findings:

The study strongly highlights the importance of language in effective communication. Extension workers frequently used mixed languages (52.0%), which aligns with farmer preferences for a blend of local languages and English (45.0%). This practice appears to be highly effective, as both local dialects (mean score of 3.26) and mixed languages (mean score of 3.17) resulted in higher farmer understanding levels compared to English only (mean score of 1.86). This suggests that code-switching and language adaptation are not merely practical but are critical for ensuring comprehension, especially when conveying technical agricultural concepts.

Beyond language, communication methods significantly impact effectiveness. Demonstrations (mean score of 4.21) were perceived as the most effective, followed by individual consultations (mean score of 4.02) and group discussions (mean score of 3.94). This emphasizes the value of practical, hands-on, and interactive approaches over passive methods like printed materials (mean score of 2.98).

4.4 Linguistic Techniques Employed by Extension Workers

Qualitative Analysis of Linguistic Techniques

Through thematic analysis of interviews and observations, six major linguistic technique categories emerged.

Theme 1: Language Adaptation and Code-Switching

Extension workers exhibited advanced code-switching patterns, skillfully adapting their language use according to the characteristics of the farmers and the specific communication context. Several sub-themes emerged from the data. These included the strategic use of local dialects to build rapport and trust, the blending of English with local languages to convey technical agricultural concepts more effectively, and the modification of language based on the age of the audience to enhance understanding and engagement.

An extension worker (Extension Worker 15) stated, "When I meet elderly farmers, I start with Kanuri greetings and traditional respect phrases. For technical terms like 'nitrogen fixation,' I say it in English first, then explain in Hausa as 'maganin kasar da yake sa amfani su girma kuma suyi karfi' (the soil medicine that makes crops grow strong)".

Theme 2: Metaphorical and Analogical Communication

Extension workers frequently employed metaphors and analogies drawn from local cultural and agricultural contexts. Table 4.8 quantifies the frequency of these techniques observed in 45 interactions. Family/kinship analogies were the most common (40.0%), followed by traditional farming comparisons (26.7%).

Table 4.8: Frequency of Metaphorical Communication Techniques (N=45 observations)

Metaphor Category	Frequency	Percentage	Example
Family/kinship analogies	18	40.0%	"Seeds are like children needing proper care"
Traditional farming comparisons	12	26.7%	"New technique is like adding spices to soup"
Religious references	8	17.8%	"God blesses prepared soil like prepared hearts"
Local crafts/trades	5	11.1%	"Soil preparation like weaving - each step matters"
Natural phenomena	2	4.4%	"Irrigation like rain - timing is everything"

Theme 3: Narrative and Storytelling Techniques

Stories and narratives were commonly used to illustrate successful innovation adoption. Table 4.9, based on farmer reports (N=100), indicates that storytelling was often or always used by extension workers (35.0% and 23.0% respectively).

Table 4.9: Use of Storytelling Techniques by Extension Workers (N=100)

Storytelling Frequency	Farmer Reports	Percentage
Always	23	23.0
Often	35	35.0
Sometimes	28	28.0
Rarely	12	12.0
Never	2	2.0

Theme 4: Interactive and Participatory Communication

Extension workers employed various techniques to encourage farmer participation and two-way communication. Farmer 42 noted, "Malam Yahya always asks what we think first. He says 'What has been your experience with this?' before telling us new things. This makes us feel our knowledge is important too".

Theme 5: Trust-Building Linguistic Strategies

Specific language patterns contributing to trust development in the post-conflict context were identified. As shown in Table 4.10 (N=45 observations), respectful address forms (93.3%) and consistent message delivery (88.9%) were highly observed trust-building behaviours.

Table 4.10: Trust-Building Communication Behaviours (N=45 observations)

Behaviour	Observed Frequency	Percentage
Acknowledging farmer expertise	38	84.4
Using respectful address forms	42	93.3
Expressing empathy for challenges	35	77.8
Consistent message delivery	40	88.9
Active listening indicators	33	73.3

Theme 6: Simplification and Clarification Strategies

Extension workers employed various linguistic techniques to make complex concepts accessible. Table 4.11 (N=45 observations) reveals that breaking down complex concepts (91.1%) and repetition of key information (88.9%) were the most frequently used simplification techniques.

Table 4.11: Simplification Techniques Used by Extension Workers (N=45 observations)

Technique	Frequency	Percentage
Breaking down complex concepts	41	91.1
Using everyday vocabulary	38	84.4
Step-by-step explanations	35	77.8
Repetition of key information	40	88.9
Checking for understanding	33	73.3

Findings:

The qualitative analysis identified six key linguistic techniques employed by extension workers, demonstrating their adaptive and nuanced communication strategies:

- **Language Adaptation and Code-Switching:** This theme revealed the strategic use of local dialects for rapport building and mixing English with local languages for technical concepts, demonstrating an age-appropriate modification of language. This directly supports the quantitative finding that mixed languages and local dialects lead to better understanding.
- **Metaphorical and Analogical Communication:** The frequent use of metaphors, particularly family/kinship analogies (40.0%), traditional farming comparisons (26.7%), and religious

references (17.8%), highlights how extension workers leverage familiar cultural constructs to explain new ideas. This technique simplifies complex information and makes it relatable.

- **Narrative and Storytelling Techniques:** The significant use of storytelling (35.0% often, 23.0% always) serves to illustrate successful innovation adoption. Stories can be powerful tools for conveying practical knowledge and inspiring confidence, particularly in contexts where literacy may be low.
- **Interactive and Participatory Communication:** The emphasis on encouraging farmer participation and two-way communication, as exemplified by "Malam Yahya", fosters a sense of ownership and validates farmers' existing knowledge. This participatory approach can build trust and facilitate a more dynamic learning environment.
- **Trust-Building Linguistic Strategies:** The consistent observation of behaviors like using respectful address forms (93.3%), acknowledging farmer expertise (84.4%), and expressing empathy (77.8%) are crucial in a post-conflict setting where trust may be fragile. These strategies are fundamental for establishing strong, enduring relationships.
- **Simplification and Clarification Strategies:** Techniques such as breaking down complex concepts (91.1%), using everyday vocabulary (84.4%), and repetition of key information (88.9%) demonstrate a deliberate effort to ensure accessibility and retention of information. This aligns with the preference for "simple and practical" communication styles among farmers.

4.5 Trust and Relationship Building

Trust Levels in Extension Worker Information

Table 4.12 presents farmer trust levels in extension worker information (N=100). A combined 73.0% of farmers either "Completely trust" (28.0%) or "Mostly trust" (45.0%) the information provided by extension workers.

Table 4.12: Farmer Trust Levels in Extension Worker Information (N=100)

Trust Level	Frequency	Percentage
Completely trust	28	28.0
Mostly trust	45	45.0
Somewhat trust	20	20.0
Rarely trust	5	5.0
Do not trust	2	2.0

Factors Influencing Trust in Post-Conflict Context

Table 4.13 examines the perceived impact of conflict on trust in agricultural advice (N=100). A total of 77.0% of farmers reported that conflict either "Greatly affected" (35.0%) or "Somewhat affected" (42.0%) their trust.

Table 4.13: Impact of Conflict on Trust in Agricultural Advice (N=100)

Impact Level	Frequency	Percentage
Greatly affected	35	35.0
Somewhat affected	42	42.0
Not affected	20	20.0
Not applicable	3	3.0

Extension Worker Understanding of Post-Conflict Challenges

Farmer perceptions of extension worker understanding are detailed in Table 4.14 (N=100). The majority of farmers (60.0%) believed extension workers either "Completely understand" (22.0%) or "Mostly understand" (38.0%) the post-conflict challenges.

Table 4.14: Farmer Perceptions of Extension Worker Understanding (N=100)

Understanding Level	Frequency	Percentage
Completely understand	22	22.0
Mostly understand	38	38.0
Somewhat understand	28	28.0
Rarely understand	8	8.0
Do not understand	4	4.0

Findings:

The study records high levels of trust in extension workers' information, with 73.0% of farmers completely or mostly trusting the advice given. This trust is paramount, especially given that 77.0% of farmers indicated that conflict had affected their trust in agricultural advice. The perception that extension workers understand post-conflict challenges (60.0% completely or mostly understand) further reinforces this trust.

The findings strongly suggest a positive impact on innovation adoption. The majority of farmers (70.0%) adopted 1-4 new techniques within the past two years. Critically, "clear explanation by extension worker" (78.0%) and "trust in extension worker" (65.0%) were the leading factors influencing adoption decisions. This highlights the direct link between effective communication, established trust, and the successful uptake of new agricultural practices. Moreover, a significant increase in crop yields (73.0% reporting slight or significant increase) since interacting with extension services demonstrates the tangible positive outcomes of these efforts.

4.6 Innovation Adoption Patterns

Innovation Adoption Rates

Table 4.15 illustrates the number of new techniques adopted by farmers in the past two years (N=100). The highest percentage of farmers (38.0%) adopted 1-2 new techniques, while 32.0% adopted 3-4 techniques. Only 12.0% of farmers adopted no new techniques.

Table 4.15: Number of New Techniques Adopted in Past Two Years (N=100)

Number of Techniques	Frequency	Percentage
None	12	12.0
1-2 techniques	38	38.0
3-4 techniques	32	32.0
5-6 techniques	15	15.0
More than 6	3	3.0

Factors Influencing Innovation Adoption

Table 4.16 outlines the factors influencing adoption decisions, allowing for multiple responses (N=100). Clear explanation by extension workers (78.0%) and trust in extension workers (65.0%) were the most frequently cited factors.

Table 4.16: Factors Influencing Adoption Decisions (Multiple responses allowed, N=100)

Factor	Frequency	Percentage
Clear explanation by extension worker	78	78.0
Trust in extension worker	65	65.0
Seeing results on other farms	58	58.0
Compatibility with existing practices	52	52.0
Low cost of implementation	48	48.0
Community acceptance	35	35.0
Others	8	8.0

Impact on Crop Yields

Changes in crop yield since extension interaction are presented in Table 4.17 (N=100). A combined 73.0% of farmers reported either a "Significantly increased" (32.0%) or "Slightly increased" (41.0%) crop yield.

Table 4.17: Changes in Crop Yield Since Extension Interaction (N=100)

Yield Change	Frequency	Percentage
Significantly increased	32	32.0
Slightly increased	41	41.0
No change	18	18.0
Slightly decreased	7	7.0
Significantly decreased	2	2.0

Findings:

The study reveals a moderate but widespread adoption of agricultural innovations among farmers over the past two years. Most respondents had incorporated at least one new technique into their farming practices, with 38% adopting one to two innovations and 32% adopting three to four. Smaller proportions adopted five or more techniques, while only 12% reported no adoption at all. This pattern indicates a general openness to innovation within the farming community and reflects ongoing engagement with agricultural advancements. Key factors influencing adoption included the clarity of explanations provided by extension workers (78%) and the level of trust placed in them (65%). Additional motivations involved seeing successful outcomes on other farms, compatibility with current practices, low implementation costs, and community acceptance. These elements highlight the importance of accessible communication, credibility, social influence, and affordability in encouraging innovation. Most importantly, the adoption of these techniques translated into tangible benefits, with 73% of farmers reporting increased crop yields—further reinforcing the value of extension services in enhancing agricultural productivity.

4.7 Communication Preferences and Styles

Preferred Communication Styles

Table 4.18 shows farmer preferences for extension worker communication styles (N=100). The most preferred style was "Simple and practical" (48.0%), followed by "Question and answer format" (23.0%).

Table 4.18: Farmer Preferences for Extension Worker Communication Styles (N=100)

Communication Style	Frequency	Percentage
Simple and practical	48	48.0
Question and answer format	23	23.0
Story-telling approach	15	15.0
Group discussion format	10	10.0
Direct and technical	4	4.0

Language Preferences

Table 4.19 details farmer language preferences for extension communication (N=100). A "Mix local language with English" was preferred by 45.0% of farmers, while 32.0% preferred using "only simple, everyday words".

Table 4.19: Farmer Language Preferences for Extension Communication (N=100)

Language Preference	Frequency	Percentage
Mix local language with English	45	45.0
Use only simple, everyday words	32	32.0
Speak only in local language	18	18.0
Use technical terms with explanations	5	5.0

4.8 Statistical Analysis and Correlations

Correlation Analysis

Table 4.20 presents a correlation matrix of key variables. All variables exhibited statistically significant positive correlations at the $p < 0.01$ level. Communication Effectiveness showed a strong positive correlation with Language Understanding ($r = 0.718$, $p < 0.01$) and Innovation Adoption ($r = 0.673$, $p < 0.01$). Trust Level also had strong positive correlations with Language Understanding ($r = 0.624$, $p < 0.01$) and Innovation Adoption ($r = 0.658$, $p < 0.01$).

Table 4.20: Correlation Matrix of Key Variables

Variables	1	2	3	4	5
1. Language Understanding	1.000				
2. Trust Level	0.624**	1.000			
3. Communication Effectiveness	0.718**	0.592**	1.000		
4. Innovation Adoption	0.542**	0.658**	0.673**	1.000	
5. Yield Improvement	0.398**	0.521**	0.587**	0.745**	1.000

****p<0.01, *p<0.05**

Regression Analysis

Table 4.21 displays the results of a multiple regression analysis predicting innovation adoption. The model explained 68.7% of the variance in innovation adoption ($R^2=0.687$), which was statistically significant ($F(5,94)=41.29$, $p<0.001$). Communication Effectiveness ($\beta=0.356$, $p<0.001$), Trust Level ($\beta=0.287$, $p<0.001$), Language Understanding ($\beta=0.198$, $p<0.01$), and Farmer Education Level ($\beta=0.142$, $p<0.05$) were significant positive predictors of innovation adoption. Extension Worker Experience was not a significant predictor ($\beta=0.095$, $p=0.174$).

Table 4.21: Multiple Regression Analysis - Predictors of Innovation Adoption

Predictor Variables	B	SE B	β	t	P
Language Understanding	0.234	0.089	0.198	2.629	0.010*
Trust Level	0.345	0.102	0.287	3.382	0.001**
Communication Effectiveness	0.421	0.095	0.356	4.432	0.000**
Farmer Education Level	0.156	0.078	0.142	2.000	0.048*
Extension Worker Experience	0.089	0.065	0.095	1.369	0.174

$R^2=0.687$, Adjusted $R^2=0.670$, $F(5,94)=41.29$, $p<0.001$ **p<0.01 *p<0.05

Findings:

The correlation analysis provided robust statistical support for the relationships observed in the descriptive findings. All key variables (Language Understanding, Trust Level, Communication Effectiveness, Innovation Adoption, and Yield Improvement) were significantly and positively correlated at $p<0.01$. Notably, Communication Effectiveness had a strong positive correlation with Language Understanding ($r=0.718$) and Innovation Adoption ($r=0.673$). This reinforces the idea that effective communication, often facilitated by linguistic adaptation, leads to better farmer understanding, which in turn drives innovation adoption. Trust Level also showed strong correlations with Language Understanding ($r=0.624$) and Innovation Adoption ($r=0.658$).

The multiple regression analysis further solidified these relationships, explaining a substantial 68.7% of the variance in innovation adoption ($R^2=0.687$). Communication Effectiveness emerged as the strongest predictor of innovation adoption ($\beta=0.356$, $p<0.001$), followed by Trust Level ($\beta=0.287$, $p<0.001$) and Language Understanding ($\beta=0.198$, $p<0.01$). Farmer Education Level was also a significant predictor ($\beta=0.142$, $p<0.05$), suggesting that foundational education supports the adoption process. Interestingly, Extension Worker Experience, while likely valuable, did not emerge as a statistically significant predictor in this model ($\beta=0.095$, $p=0.174$). This might imply that while experience is a factor, the quality of communication and established trust are more immediate drivers of adoption.

5. Summary, Conclusion, and Recommendations

The data unequivocally demonstrate that linguistic techniques employed by agricultural extension workers play a pivotal role in communication effectiveness, trust-building, and ultimately,

innovation adoption and yield improvement in post-conflict Borno State. The strategic use of language adaptation, code-switching, metaphors, storytelling, and participatory approaches are instrumental in bridging communication gaps and fostering trust. These findings provide strong

evidence that culturally and linguistically sensitive communication, coupled with trust-building efforts, are key drivers for successful agricultural extension services in challenging contexts. The high levels of trust and positive impact on crop yields validate the effectiveness of these linguistic strategies and communication approaches.

5.1 Summary of Findings

The findings of this study underscore the pivotal role of linguistic strategies in agricultural extension communication within post-conflict contexts. Extension workers in Borno State did not rely solely on the content of their message but invested in the form, delivery, and sociolinguistic framing to enhance message resonance and comprehension.

The widespread use of code-switching, especially mixing English with local dialects, reflects both a necessity and a deliberate pedagogical strategy. This aligns with Aker (2011) and Bentley et al. (2007), who found that localized, mixed-language communication is crucial for audience comprehension and receptivity, particularly in low-literacy environments.

Metaphorical language, including kinship and religious analogies, served as cognitive scaffolds for abstract or technical concepts. These analogies resonate with local ontologies and help anchor innovations in familiar cultural frameworks; a process theorized in Speech Acts Theory as essential for perlocutionary success.

The participatory tone adopted by many extension workers; inviting questions, validating local knowledge, and employing storytelling, echoes the tenets of Trauma-Informed Communication and Social Learning Theory. Such approaches are not only more engaging but also help rebuild damaged trust; a critical asset in post-conflict agricultural recovery (Bauman, 2009).

Statistically, the strong correlation between communication effectiveness and innovation adoption reinforces the hypothesis that language is not peripheral but central to agricultural transformation. Interestingly, the lack of significance for extension worker experience suggests that communication quality trumps tenure in influencing farmer behaviour.

The study also reveals that while post-conflict

dynamics introduce scepticism, consistent, empathetic communication can restore trust and facilitate behavioural change. These findings demand a paradigm shift in extension training, from technical mastery alone to linguistic, interpersonal, and culturally adaptive competence.

5.2 Conclusion

This study provides compelling empirical evidence that linguistic techniques employed by agricultural extension workers play a decisive role in the effectiveness of communication, the restoration of trust, and the uptake of agricultural innovations in post-conflict settings. In Borno State, Nigeria, where insurgency has deeply disrupted social structures, communication cannot be treated as a neutral or technical exercise. Instead, it must be recognized as an act of relationship-building, cultural negotiation, and psychological reassurance.

The use of code-switching, contextually appropriate metaphors, storytelling, and participatory dialogue reflects a high degree of linguistic agency among extension workers. These strategies do more than simplify information, they reconstitute fractured social bonds, increase information salience, and empower farmers to adopt and sustain new agricultural practices.

The study's regression analysis reinforces this conclusion: communication effectiveness, trust, and language understanding were the strongest predictors of innovation adoption, far more so than the extension worker's years of experience. These findings suggest that effective extension work in post-conflict zones requires not only technical expertise but also refined communicative competence rooted in sociolinguistic and cultural awareness.

In light of these insights, agricultural development interventions in post-conflict contexts must rethink how they conceptualize and support communication. Linguistic sensitivity should be treated not as an ancillary skill but as a strategic imperative.

5.3 Recommendations

For Extension Services and Policymakers:

1. **Linguistic and Communication Training:** Develop and institutionalize

structured training programs that equip extension workers with skills in code-switching, metaphor use, and audience-specific language adaptation. Training should incorporate modules on interpersonal communication, trauma-informed dialogue, and cultural fluency.

2. **Cultural Resonance and Participatory Approaches:** Promote storytelling, analogical reasoning, and participatory discourse as standard practices in extension engagement. Encourage the use of locally relevant narratives and metaphors that align innovations with community values and lived experiences.
3. **Trust-Building Protocols:** Institutionalize trust-building communication norms, such as respectful address, message consistency, empathy, and validation of local knowledge, especially when working with communities affected by conflict.
4. **Reduced Reliance on Text-Based Materials:** Given widespread literacy constraints, shift emphasis toward oral, visual, and demonstrative communication methods (e.g., field demonstrations, radio messages, audio-visual materials) that are more accessible and effective.
5. **Communication Monitoring and Feedback Loops:** Establish

mechanisms to routinely assess communication effectiveness using farmer feedback. Regular qualitative assessments (e.g., participatory evaluations, focus groups) can help adapt strategies in real time.

For Future Research:

1. **Longitudinal Impact Studies:** Conduct longitudinal research to assess the sustained impact of linguistic strategies on innovation uptake, retention, and productivity outcomes over multiple planting seasons.
2. **Comparative Cross-Regional Analysis:** Examine how linguistic strategies vary across different post-conflict regions and cultural-linguistic groups within Nigeria and beyond, to identify context-specific best practices.
3. **Extension Worker Voice and Agency:** Undertake in-depth qualitative studies that explore extension workers' own perceptions of language use, communicative barriers, and training needs.
4. **Experimental Studies on Metaphorical Framing:** Investigate how specific metaphor types (e.g., kinship vs. religious vs. ecological) influence comprehension, emotional engagement, and behavioural outcomes in agricultural contexts.

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