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Language choice for natural resource conservation and agricultural production information sharing and communication strategies for improved livelihoods among rural farmers in Southeast, Nigeria

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ABSTRACT

This study examined the role of language choice in agricultural information sharing and communication among farmers in Southeast Nigeria, where linguistic diversity presents significant challenges to the dissemination of agricultural innovations and practices. A total of 320 farmers were randomly selected from the study area. Data were collected through questionnaires and oral interviews and analyzed using means, standard deviations, and percentages. The results showed that the most commonly used languages for agricultural information dissemination were Igbo (87.5%), English (68.8%), Nigerian Pidgin (60.3%), and local dialects (56.1%). Farmers preferred the Igbo language because it enhanced understanding and clarity (M = 2.56), promoted higher adoption of innovations (M = 2.50), reduced mistakes (M = 2.47), and encouraged better participation in learning activities (M = 2.54). Language choice improved understanding of information (M = 2.45), enhanced productivity (M = 2.50), and strengthened farmers' confidence and voice (M = 2.44). The major impacts of appropriate language use included improved comprehension (M = 2.41), increased adoption of innovations (M = 2.37), knowledge retention (M = 2.35), and trust and credibility (M = 2.34). Information-sharing strategies included farmer-to-farmer interaction (75.0%), media and technology (59.4%), and visual and non-verbal communication (46.9%). Key information shared with farmers included pest and disease control (85.9%), crop production (84.4%), market information (82.8%), livestock management (81.3%), and health and safety information (76.5%). Strategies for improving communication included strengthening extension services (87.5%), simplifying technical content (85.9%), utilizing local media platforms (84.2%), and prioritizing indigenous languages (81.2%). The study recommends prioritizing indigenous languages in agricultural communication to enhance knowledge transfer, farmer empowerment, and sustainable agricultural development in Southeast Nigeria.

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INTRODUCTION

Agriculture continues to play a vital role in Nigeria's economy, especially in the southeastern region, where small-scale farmers form the backbone of food production. The sector is key to ensuring food security, generating employment, and supporting rural livelihoods (Food and Agriculture Organization [FAO], 2022). Yet, the success of farming in this region hinges significantly on farmers' ability to access timely, relevant, and easily understandable agricultural information. For practices such as improved cultivation methods, pest control, climate resilience, and market access to be adopted, the information must be clearly communicated and effectively received (Aker, 2011; Davis and Sulaiman, 2014). Effective communication is essential for agricultural progress, and language is a major determinant of how well messages are conveyed and understood. In a linguistically diverse country like Nigeria, selecting the right language is critical to reaching farming communities and ensuring comprehension. The southeast is primarily home to Igbo-speaking people, but differences in dialects and the official use of English create a complex setting for agricultural outreach (Eze and Okwu, 2020). Although English is commonly used in formal extension programs, many rural farmers have limited command of it, which can limit their understanding and ability to apply the information provided.

Local languages, especially Igbo and its regional variations, are often more familiar and effective in conveying agricultural knowledge to rural populations. Research indicates that farmers are more likely to embrace new techniques when information is shared in a language they understand well (Okwu and Umoru, 2009). However, using indigenous languages presents challenges, such as the absence of standardized terms for technical concepts, a shortage of translated resources, and inadequate preparation of extension workers in delivering content in local languages (Agwu *et al.*, 2018). In recent years, digital tools, radio broadcasts, and mobile-based advisory services have changed how agricultural information is shared. Still, the impact of these platforms depends heavily on language. Radio, for example, remains a popular medium among rural farmers in the southeast, and programs in local languages typically attract larger audiences and produce greater influence (Omenesa *et al.*, 2020). Likewise, mobile advisory services that include local languages have shown better engagement and higher rates of information retention among farmers (Fabregas *et al.*, 2019).

Language significantly shapes how individuals and communities perceive, interact with, and govern natural resources. Beyond a mere communication tool, it embodies indigenous wisdom, cultural principles, and ecological ethics that inform sustainable resource management and conservation. In numerous rural and Indigenous groups, ecological insights are transmitted orally-through tales, sayings, melodies, and daily interactions in regional languages. These narratives safeguard decades of gathered environmental knowledge, directing sustainable methods in agriculture, forestry, water management, and biodiversity conservation (Maffi, 2005; UNESCO, 2017). Natural resource preservation entails the stewardship and safeguarding of resources such as land, water, forests, and wildlife to avert overexploitation and guarantee long-term accessibility. For rural communities, whose livelihoods depend critically on these resources for sustenance, income, and overall well-being, effective conservation is vital. However, these initiatives frequently struggle when local languages and traditional knowledge frameworks are excluded from environmental decision-making and strategies. Such omissions can obstruct communication, restrict community participation, and lead to the disintegration of valuable ecological wisdom (Berkes, 2012). A fundamental link between language and conservation resides in the safeguarding of traditional ecological knowledge. Local languages often possess specific terminology for plant and animal species, soil characteristics, meteorological patterns, and ecological systems-terms that may be absent in official or dominant languages. This specialized

language reflects profound environmental comprehension that underpins responsible resource management. For instance, Indigenous agrarians may employ unique terminology to indicate subtle variations in soil quality or rainfall patterns, which inform planting and harvesting timelines (Nabhan, 1997). As these languages dwindle, so too does the knowledge they encapsulate, which could jeopardize both conservation and livelihood strategies.

Language also influences participation in environmental policymaking. Effective conservation requires the active involvement of local communities, particularly those with a direct reliance on natural resources. When information is disseminated in languages that individuals fully grasp, it enhances awareness, trust, and collaboration with conservation efforts. Conversely, linguistic obstacles can result in misunderstandings, exclusion from policy dialogues, and resistance to initiatives. Thus, incorporating local languages into environmental education and policy communication is essential for inclusive and effective resource governance (UNEP, 2019).

Furthermore, language serves as a formidable instrument for fostering environmental consciousness and promoting sustainable actions. Outreach initiatives conducted in local languages-especially those leveraging culturally significant forms such as proverbs, folk tunes, or storytelling are more likely to resonate and affect daily actions. Information regarding deforestation, soil degradation, or water contamination holds greater weight when conveyed through culturally significant communication, facilitating alignment between conservation objectives and enhanced livelihoods (Berkes, 2012). The recurring interaction among language, conservation, and livelihoods is especially critical in developing areas where communities are directly dependent on ecosystems. Here, sustainable resource management is intricately tied to food security, economic resilience, and adaptability to climate-related adversities like droughts and floods. Language helps to integrate scientific knowledge with local experiences, enabling communities to adopt contemporary conservation techniques without relinquishing traditional practices. This blend reinforces wider development goals, particularly those centered on alleviating poverty, safeguarding the environment, and ensuring food security.

Nevertheless, globalization and modernization are hastening the decline of numerous Indigenous languages. As younger generations gravitate towards dominant languages for education and employment, the passage of environmental knowledge through generations becomes less effective. This transformation endangers not only cultural plurality but also biodiversity, as studies reveal a strong correlation between linguistic diversity and ecological richness (Gorenflo *et al.*, 2012). Consequently, the preservation and revitalization of Indigenous languages are increasingly recognized as essential components of successful conservation efforts.

Despite these developments, there remains limited insight into how language selection affects the success of agricultural communication in the region. Most extension systems still prioritize English, which may exclude many farmers with limited proficiency. As a result, understanding the impact of language choice is crucial for developing inclusive and effective communication strategies that reflect the linguistic context of the farming communities they aim to serve. Effectively sharing agricultural production information is crucial for boosting farmers' productivity, strengthening food security, and supporting sustainable farming practices. In Southeast Nigeria, however, the success of agricultural extension services and communication efforts has been hindered by various challenges, with language selection being a significant but frequently neglected factor. While English is Nigeria's official language and the main medium in formal extension programs, many rural farmers in the region struggle to understand it. This language gap limits their capacity to grasp and implement key agricultural advice and innovations (Eze and Okwu, 2020). As a result, important knowledge on better farming techniques, pest management, climate resilience, and

market access often fails to reach them, contributing to low adoption rates and weaker agricultural performance.

Conversely, local languages like Igbo are widely spoken and more accessible to rural farming communities, yet they are underutilized in official agricultural communication. Extension workers frequently lack the training and tools to accurately convey technical farming concepts in these languages. Furthermore, the lack of consistent agricultural terminology in indigenous languages makes accurate translation difficult (Agwu *et al.*, 2018). This disconnects between the language used in outreach and the language farmers understand undermines the efficiency of information delivery. Even as modern communication tools- such as radio, television, and mobile platforms-become more common, they have not fully overcome the language issue.

Many of these channels continue to operate primarily in English or include local languages only superficially, reducing their relevance and impact among rural audiences (Omenesa *et al.*, 2020). Consequently, a large number of farmers remain disconnected from vital agricultural updates.

Although language is acknowledged as a key element in effective communication, there is still little research specifically examining how language choices influence the sharing of agricultural information in Southeast Nigeria. This lack of evidence limits the creation of informed policies and practical strategies to improve communication outcomes in the sector. To address this gap, this study investigates how language selection affects the dissemination of agricultural knowledge, identifies the languages currently in use, and evaluates their effectiveness in helping farmers understand and adopt new farming practices in Southeast Nigeria. This study addresses a notable gap in agricultural communication research by focusing on how language selection affects the dissemination of information. While previous studies have examined extension systems and communication channels, the linguistic dimensions-particularly in multilingual contexts like Southeast Nigeria-have received limited attention (Davis and Sulaiman, 2014). The research offers practical benefits for improving agricultural extension services. By identifying which languages are most effective for conveying farming information, it provides concrete guidance for extension agents to tailor their messages to rural farming communities. This can enhance understanding, promote the uptake of modern agricultural practices, and ultimately boost productivity (Aker, 2011). Given the high levels of poverty in rural Southeast Nigeria, choosing appropriate languages for outreach may lead to tangible social and economic gains (FAO, 2022). Finally, the research contributes to academic discourse on language and communication in development contexts. It presents empirical evidence on how language decisions influence communication effectiveness, adding to scholarly conversations and laying groundwork for future research in similar settings. The main objective of this study is to examine the role of language choice in agricultural production information sharing and communication in Southeast Nigeria. The specific objectives are to: a). identify the languages commonly used in agricultural production information dissemination in Southeast Nigeria; b). assess rural farmers' preferences for indigenous versus foreign languages in agricultural communication; c). assess the effectiveness of indigenous and foreign languages in enhancing the adoption of agricultural innovations among farmers; d). determine the perceived influence of language choice on farmers' livelihoods and empowerment; e). determine the factors influencing language choice in agricultural communication by extension agents and other stakeholders; f). describe the agricultural production information shared and communicated to farmers; g). identify agricultural production information strategies used; h). propose strategies for improving language use in agricultural communication to enhance farmers' productivity and livelihoods.

MATERIALS AND METHODS

Southeast Nigeria is one of the country's six geopolitical zones and includes five states: Abia, Anambra, Ebonyi, Enugu, and Imo. The area is

primarily home to the Igbo people, who share a common language and cultural background. While Igbo is the main native language spoken, English is used officially in administration, education, and formal communication (National Population Commission [NPC], 2010). The region is recognized for its active entrepreneurial spirit, high population density, and dynamic economic life. Its economy relies on a combination of agriculture, trade, and small-scale manufacturing. Farming continues to be a central livelihood, with staple crops like cassava, yam, rice, and palm products widely grown. Major commercial cities such as Onitsha and Aba play crucial roles in national trade and commerce (Nwafor, 2019). This study was carried out across the five states of Southeast Nigeria and used a descriptive survey design to explore how language choices affect the sharing of agricultural production information. This approach is suitable for capturing current conditions, attitudes, and practices related to language use in agricultural communication (Creswell and Creswell, 2018). It enables an assessment of farmers' preferences between local and foreign languages and how these preferences impact the spread and uptake of agricultural innovations. The study population included smallholder farmers, agricultural extension workers, and agricultural information officers in the region. Smallholder farmers make up the bulk of food producers and are the main recipients of agricultural knowledge. Extension and communication personnel were included due to their role as key links in delivering farming information (Feder *et al.*, 2010). Given the large and geographically spread population, a multi-stage sampling method was applied. First, the region was divided into its five constituent states. Second, two local government areas (LGAs) were randomly chosen from each state. Third, two rural farming communities with substantial agricultural activity were purposively selected within each LGA. Finally, a total of 350 respondents were proportionally and randomly selected from these communities: 300 smallholder farmers, 20 extension agents, and 30 communication officers. This sample size supports reliable generalization and statistical validity (Yamane, 1967). Data were gathered through both primary and secondary sources. Primary data came from structured questionnaires given to farmers and extension agents, interview guides used with communication officers and focus group discussions (FGDs) involving selected farmers. Secondary data were drawn from academic journals, government documents, agricultural reports, and earlier research on agricultural communication and language use. The research tools were reviewed and validated by experts in agricultural extension and communication (Field, 2013). Data analysis involved frequency counts, percentages, means, and standard deviations, with a three-point Likert-type scale used to determine mean scores.

RESULTS AND DISCUSSION

Languages commonly used in agricultural information sharing

Table 1 shows that in Southeast Nigeria, Agricultural information dissemination occurs within a multilingual environment, where both indigenous and foreign languages are used depending on the communication channel, audience, and level of formality. These languages include Igbo (87.5%), which is the dominant language spoken by majority in southeast, Nigeria. English is the second most popular language, used by 68.8% of respondents, followed by Nigerian Pidgin English (60.3%), local minority languages/dialects(56.1%), which includes those used in some parts of Owerri, Onitsha, , Ikwerre areas of Rivers State, Aba and other towards in Southeast, Nigeria. Hausa and Yoruba languages (34.3%) are also used in the zone. In Southeast Nigeria, the spread of agricultural information is deeply shaped by the region's linguistic variety and sociocultural environment. Successfully reaching farmers relies not just on the communication channels-like radio, mobile phones, and extension services-but also on using a language they understand. Research indicates that when farmers receive timely and clear agricultural information, their productivity, decision-making, and willingness to adopt new practices improve significantly (Adebisi *et al.*, 2021). In rural areas, especially among small-

scale farmers, local languages play a vital role, as many lack strong command of formal or official languages such as English. Delivering information in familiar native tongues therefore boosts understanding, builds trust, and supports changes in farming behavior (Adeyeye *et al.*, 2024). In this region, Igbo is the primary language used for sharing agricultural knowledge, though other indigenous languages like Ikwerre, Ibibio, Efik, and Ogoni dialects such as Eleme are also employed depending on the local community. English remains in use, particularly in official extension programs, printed materials, and digital content, but its impact is often constrained by low literacy rates among rural farmers. Evidence suggests that blending English with local languages—especially in radio programs and mobile messaging—enhances both accessibility and comprehension (Fadairo, 2021). Notably, radio programs in indigenous languages continue to be one of the most effective means of reaching rural audiences, given radio's widespread availability and popularity in these communities (Samuel and Apata, 2021). Ultimately, incorporating local languages into agricultural communication is crucial for inclusive development in Southeast Nigeria. Adopting multilingual strategies ensures that farming communities with diverse linguistic backgrounds can access vital information on innovations, policies, and best practices, leading to greater adoption and improved rural livelihoods.

Role of languages in natural agricultural resource conservation

Languages play a critical role in ensuring effective communication, awareness creation, and participation in natural agricultural resource conservation. They enable farmers, extension agents, and communities to share knowledge about sustainable practices and environmental protection. Through language, dissemination of conservation information (89.1%) becomes possible, understanding of extension messages (84.1%), indigenous knowledge transfer (81.3%), environmental education campaigns (78.1%), community participation in conservation (75%), adoption of sustainable practices (71.9%), early warning communication (68.8%), and conflict resolution (65.6%). Language is essential to conserving natural agricultural resources, acting as a channel for sharing knowledge, engaging communities, and supporting policy execution (Table 2).

Indigenous and local languages are especially important as repositories of traditional ecological knowledge—encompassing methods for soil protection, water use, biodiversity maintenance, and sustainable farming (FAO, 2019). Through oral histories, proverbs, and storytelling, communities preserve and transmit environmentally sound practices across generations, helping sustain long-term conservation.

Moreover, language improves communication between agricultural advisors and farmers. When guidance on conservation is provided in a language farmers are familiar with, it enhances understanding, builds trust, and encourages the uptake of sustainable practices (Aker, 2011). It also supports participatory resource management by enabling farmers to share their local insights and experiences during planning and decision-making. Language also influences cultural perspectives on the environment. Many indigenous languages reflect deep respect for nature and highlight the interdependence between people and ecosystems, fostering behaviors that support conservation (Maffi, 2005). At the policy level, using inclusive, multilingual communication helps ensure conservation initiatives reach diverse audiences, particularly in rural regions marked by significant linguistic variety.

Farmers' preference for indigenous over foreign languages

Table 3 presents reasons why farmers in Southwest Nigeria prefer Igbo, an indigenous language to English language. . With an accepted mean (M) score of 2.00, the following reasons were identified: better understanding and clarity (M= 2.56), cultural relevance (M= 2.53), higher adoption of innovation (M= 2.50), trust and credibility (M= 2.44), inclusiveness (M= 2.51), reduction of mistakes (M= 2.47), faster learning of programs (M= 2.52), very clear

communication (M= 2.48), preservation of traditional knowledge (M= 2.43), and better participation in farm programs (M= 2.54). These responses indicate that farmers in Southeast Nigeria operate within a socio-cultural context where language has a significant influence on how agricultural information is received, interpreted, understood, shared, and applied. The choice between indigenous and foreign languages in agricultural communication significantly affects how rural farmers access knowledge, adopt new practices, and improve productivity. In many developing countries, such as Nigeria, indigenous languages are the main means of everyday communication in rural areas. Research indicates that farmers understand and trust agricultural information better when it is shared in their native languages, as this improves comprehension and aligns with cultural context (Aker, 2011; Opara, 2020). Using local languages also allows complex farming techniques to be explained in familiar terms, which helps those with little formal schooling grasp and apply new methods more effectively (Daudu *et al.*, 2019).

Table 1. Languages commonly used in agricultural information sharing

Languages in use	*Frequency	Percentage
The Igbo Language	290	87.5
English Language	220	68.8
Nigerian Pidgin English	198	60.3
Local dialects/minority languages	180	56.1
Media-based language adaptation	150	46.8
Hausa/Yoruba	110	34.3

*Multiple responses

Table 2. Role of languages in natural agricultural resource conservation

Role of language in conservation	*Frequency	Percentage
Dissemination of conservation information	285	89.1
Understanding of extension messages	270	84.1
Indigenous knowledge transfer	260	81.3
Environmental education campaigns	250	78.1
Community participation in conservation	240	75.0
Adoption of sustainable practices	230	71.9
Early warning communication	220	68.8
Conflict resolution on resource use	210	65.6
Policy awareness and implementation	200	62.5
Stakeholder collaboration	190	59.4

*Multiple responses

Table 3. Farmers' preference for indigenous language over foreign language

Preference for indigenous language	Mean	SD
Better understanding and clarity	2.56	0.49
It has excellent relevance	2.53	0.53
Higher adoption of innovation	2.50	0.67
Trust and credibility	2.44	0.74
Inclusion	2.51	0.71
Reduction of mistakes	2.47	0.65
Faster learning of programs	2.52	0.68
Very clear communication	2.48	0.74
Preservation of traditional knowledge	2.43	0.73
Better participation from farmers	2.54	0.56

Accepted mean= 2.00

Language preference is also influenced by education levels. Many rural farmers have limited formal education, which often means they struggle with foreign languages like English or French-commonly used in official extension programs (Fabusoro *et al.*, 2014). This can hinder effective communication, making it harder for farmers to benefit from improved technologies.

Table 4. Effectiveness of indigenous and foreign languages adoption of agricultural innovations

Effectiveness of language choice	Mean	SD
Makes for Comprehension/clarity of information	2.41	0.71
Adoption rates of agricultural innovation	2.37	0.73
Knowledge retention and recall	2.35	0.65
Makes for participation and engagement	2.39	0.74
Enhance learning collective problem solving	2.34	0.68
Accurate application instruction	2.41	0.59
Inclusivity and equity	2.36	0.64
Speed of innovation diffusion	2.38	0.74
Trust and credibility	2.34	0.61
Reduced cognitive Barrier	2.38	0.75

Accepted mean= 2.00

Evidence shows that when agricultural advice is given in local languages, farmers are more likely to pay attention, seek clarification, and put the guidance into practice (Okwu and Umoru, 2009). Still, foreign languages continue to serve important functions, especially in academic training, policy-making, and connecting with international research. Agricultural professionals frequently use these languages to access scientific resources, technical documents, and global best practices (Aker, 2011). In some cases, combining both language types—developing content in a foreign language first, then translating it locally-has helped connect global expertise with on-the-ground needs (Daudu *et al*., 2019). This method supports innovation while ensuring messages remain clear and culturally appropriate.

Social factors such as age, gender, and community traditions also shape language choices. Older individuals and women, who often have fewer educational opportunities, typically favor indigenous languages. Younger or more educated farmers may be more comfortable with foreign languages (Fabusoro *et al*., 2014). Promoting local languages in outreach efforts can also foster greater inclusion, encouraging broader participation and reducing the sense of exclusion among less-educated groups (Opara, 2020). During oral discussion, it was observed that rural farmers to favor indigenous languages in agricultural messaging due to their accessibility and cultural resonance. While foreign languages remain valuable for technical and global engagement, incorporating local languages into extension services is crucial for effective knowledge sharing and improved farming outcomes. To support inclusive development, policymakers and extension workers should combine the strengths of both language types-using local languages for delivery and foreign languages for technical advancement (Okwu and Umoru, 2009; Daudu *et al*., 2019).

Effectiveness of indigenous and foreign languages in enhancing understanding and adoption of agricultural innovations

Table 4 showed farmers preference of local language over foreign language due to its effectiveness, in understanding agricultural messages and innovation adoption. These include the following: makes for Comprehension/clarity of information (M= 2.41), adoption rates of agricultural innovation (M= 2.37), knowledge retention and recall (M= 2.35), makes for participation and engagement (M= 2.39), enhance learning collective problem solving (M= 2.34), accurate application instruction (M= 2.41), inclusivity and equity (M= 2.36), speed of innovation diffusion (M= 2.38), trust and credibility(M= 2.34), reduced cognitive barriers (M= 2.38). Therefore, when information is shared or delivered in familiar language, such as Igbo or pidgin, adoption becomes easier and more effective. The role of both local and foreign languages in promoting the understanding and uptake of agricultural innovations is a key concern in rural development, especially in multilingual countries like Nigeria. Local languages are widely seen as effective in communicating with rural farmers because they reflect familiar cultural settings and everyday speech. Studies indicate that when agricultural knowledge is shared in native languages, farmers grasp technical content more easily, which encourages them to adopt improved

practices such as high-yield seeds, pest management, and soil conservation methods (Aker, 2011; Daudu *et al.*, 2019). This advantage is particularly evident in communities with limited literacy, where using unfamiliar foreign languages can obstruct clear communication.

The role of local and foreign languages in promoting the understanding and uptake of agricultural innovations has been extensively studied in the fields of agricultural communication and rural development. Language is a key factor in sharing knowledge, particularly in rural regions where literacy rates and linguistic diversity affect how information is understood and used. Locally spoken, culturally rooted indigenous languages have been shown to improve comprehension and build trust within farming communities. In contrast, foreign languages-often linked to formal education and international scientific networks-help convey technical and research-based knowledge (Aker, 2011; Daudu *et al.*, 2019). Indigenous languages are especially effective because they reflect the cultural and cognitive contexts of rural farmers.

When agricultural information is shared in familiar languages, farmers are better able to understand complex ideas, voice concerns, and take part in discussions that reinforce learning.

This interactive style of communication minimizes confusion and misinterpretation, supporting higher adoption rates (Okwu and Umoru, 2009). Furthermore, these languages often use local expressions and comparisons, helping make technical content more accessible and practical for everyday farming (Ani, 2013).

On the other hand, foreign languages like English or French are widely used in official extension programs, academic research, and policy documents. While they connect local efforts to global knowledge, they can hinder understanding among farmers with little exposure to formal schooling. Research indicates that relying solely on foreign languages without proper translation may result in limited comprehension, lower engagement, and reduced adoption of new technologies (Feder *et al.*, 2010). Still, these languages remain valuable when used with support from intermediaries-such as extension workers—who translate and adapt content to local settings (Aker, 2011). A combined strategy that draws on both language types has emerged as the most effective way to support understanding and adoption. Agricultural outreach that uses local languages alongside simplified technical terms from foreign languages tends to produce better results. This approach ensures scientific accuracy while preserving clarity and cultural appropriateness (Daudu *et al.*, 2009). Equally important is the role of community radio, local organizations, and peer-to-peer exchanges conducted in indigenous languages, which further enhance the spread and application of new farming practices (Ani, 2013).

On the other hand, foreign languages-especially English in Nigeria- are central to the creation and spread of agricultural knowledge at national and international levels. Scientific findings, policy frameworks, and training resources are typically produced in these languages, making them vital for research and professional exchange (Fabusoro *et al.*, 2014). Yet, their usefulness among rural populations is often constrained by limited language skills, which may result in partial or incorrect understanding. Evidence suggests that depending exclusively on foreign languages in extension work can lower adoption rates, as farmers may fail to fully appreciate how new technologies work or why they are beneficial (Okwu and Umoru, 2009). Combining both local and foreign languages has emerged as the most effective way to support farmer learning and innovation adoption. Approaches that use foreign languages for developing technical content, followed by translation into local languages, help connect research institutions with farming communities (Daudu *et al.*, 2019). This ensures that information remains scientifically sound while also being accessible and culturally appropriate. Extension workers who can draw on global knowledge while communicating in

local dialects are better equipped to support farmers in understanding and applying new techniques (Aker, 2011). Additionally, research shows that using native languages in participatory outreach-such as farmer field schools, community discussions, and radio broadcasts-boosts farmer involvement and openness to change (Opara, 2020). When farmers engage in dialogue using their mother tongue, they are more likely to ask questions, exchange experiences, and gain confidence in trying new methods.

This interactive process strengthens trust and collective learning, both of which are crucial for long-term adoption of agricultural advances (Fabusoro *et al.*, 2014). While foreign languages remain essential for accessing scientific expertise and institutional coordination, local languages are more effective in ensuring comprehension and driving adoption at the community level. A balanced strategy that draws on the strengths of both is necessary to strengthen agricultural extension systems and support sustainable rural development. To improve inclusivity and effectiveness, decision-makers and practitioners should emphasize translating and adapting agricultural content for local contexts (Okwu and Umoru, 2009; Opara, 2020).

Table 5. Perceived influence of language choice on farmers' livelihood empowerment

Language influence on livelihoods	Mean	SD
Improved farmer understanding of information	2.45	0.41
Higher adoption rates	2.31	0.50
Enhanced productivity	2.50	0.52
Better market participation	2.34	0.42
Improved food security of households	2.47	0.61
Reduced errors in input usage	2.37	0.44
Communication of accurate information	2.41	0.57
Helps understand risk/hazard	2.37	0.60
Increased participation in formal training	2.38	0.45
Improved decision making	2.33	0.55
Enhanced confidence and voice	2.44	0.54
Reduction in rural migration	2.48	0.62
Increased income and savings levels	2.41	0.54

Accepted mean = 2.00

Perceived influence of language choice on farmers' livelihoods and empowerment

Table 5 shows that language plays a fundamental role in shaping how rural farmers access information, improve decision making, increase productivity, and gain control over their livelihoods. Using a discriminatory mean (M) index of 2.00, the results showed that language choice improves farmers' understanding of innovations (M= 2.45), leads to higher adoption rates (M= 2.31), enhances productivity (M= 2.50), facilitates better market participation (M= 2.34), improves food security (M= 2.47), reduces errors in input usage (M= 2.37), communication of accurate information (M= 2.41), helps understand risk/hazard (M= 2.37), increases participation in formal learning (M= 2.38), improves decision making (M= 2.33), and enhances confidence and voice (M= 2.44), Reduction in rural migration (M= 2.48), and increased income and savings levels (M= 2.41). The language used in agricultural communication significantly affects farmers' livelihoods and empowerment, especially in rural, multilingual settings where access to information depends heavily on linguistic inclusiveness. The choice of language influences not only how well information is understood but also who can take part in sharing and using knowledge. When communication matches farmers' preferred languages, it improves their ability to access, interpret, and apply new agricultural practices-leading to better productivity, higher incomes, and improved living conditions (Aker, 2011; Ragasa *et al.*, 2016).

Using local or indigenous languages in extension services and rural development programs has been found to boost understanding and encourage greater farmer involvement. Farmers who receive

information in their native tongues are more likely to adopt improved techniques, resulting in higher crop yields and increased earnings. This happens because local languages help overcome communication obstacles, allowing farmers to interact more confidently with extension workers and peers (Okwu and Umoru, 2009). In addition, communicating in familiar languages builds trust and strengthens community ties, which supports collective efforts and long-term improvements in livelihoods (Ani, 2013).

On the other hand, relying mainly on foreign languages like English in agricultural policy, research, and training can restrict access to vital knowledge. Many rural farmers, particularly those with little formal schooling, may struggle to grasp technical content delivered in a non-native language. This language barrier can limit informed decision-making, ultimately reducing productivity and income (Feder *et al.*, 2010). Still, foreign languages play a valuable role in linking farmers to international research, markets, and technological advances. When information is accurately translated or explained by trained intermediaries, it can still benefit farming communities (Ragasa *et al.*, 2016).

Language selection also impacts farmer empowerment-their ability to make choices, access resources, and influence policies. Empowerment grows when farmers can use languages they are fluent in, as this increases their confidence, engagement in decision-making, and ability to claim needed services. Approaches that involve farmers through their native languages allow them to express needs, share traditional knowledge, and help design solutions, fostering a stronger sense of control over their farming activities (Chambers, 1994). This is especially critical for disadvantaged groups such as women and small-scale farmers, who are often left out of formal communication systems dominated by foreign languages. An effective strategy involves combining both indigenous and foreign languages to maximize the impact of agricultural outreach. Local languages promote understanding and inclusion at the community level, while foreign languages open doors to scientific knowledge and wider economic networks. By integrating both through translation, localization, and bilingual extension support communication can more effectively improve farmers' livelihoods and strengthen their empowerment (Aker, 2011).

Perceived factors influencing language choice preference

Table 6 showed that a mix of economic, cultural, social and institutional factors affect language choice and preference among respondents in Southeast, Nigeria. These factors include; level of education and literacy (M= 2.58), cultural identity and familiarity (M= 2.44), accessibility of information (M= 2.53), nature and complexity of information (M= 2.38), communication channels used (M= 2.45), socioeconomic status (M= 2.38), age and generational differences (M= 2.41), government policies and institutional influence (M= 2.58), perceived effectiveness and trust (M= 2.49),Peer influence and social networks (M= 2.47). The language used in agricultural communication significantly affects farmers' livelihoods and empowerment, especially in rural, multilingual settings where access to information depends heavily on linguistic inclusiveness.

The choice of language influences not only how well information is understood but also who can take part in sharing and using knowledge. When communication matches farmers' preferred languages, it improves their ability to access, interpret, and apply new agricultural practices—leading to better productivity, higher incomes, and improved living conditions (Aker, 2011; Ragasa *et al.*, 2016).

Using local or indigenous languages in extension services and rural development programs has been found to boost understanding and encourage greater farmer involvement. Farmers who receive information in their native tongues are more likely to adopt improved techniques, resulting in higher crop yields and increased earnings. This happens because local languages help overcome communication

obstacles, allowing farmers to interact more confidently with extension workers and peers (Okwu and Umoru, 2009). In addition, communicating in familiar languages builds trust and strengthens community ties, which supports collective efforts and long-term improvements in livelihoods (Ani, 2013). On the other hand, relying mainly on foreign languages like English in agricultural policy, research, and training can restrict access to vital knowledge. Many rural farmers, particularly those with little formal schooling, may struggle to grasp technical content delivered in a non-native language. This language barrier can limit informed decision-making, ultimately reducing productivity and income (Feder *et al.*, 2010). Still, foreign languages play a valuable role in linking farmers to international research, markets, and technological advances. When information is accurately translated or explained by trained intermediaries, it can still benefit farming communities (Ragasa *et al.*, 2016).

Table 6. Perceived factors influencing language preference

Perceived Factors	Mean	SD
Level of education and literacy	2.58	0.71
Cultural identity and familiarity	2.44	0.91
Accessibility of information	2.53	0.68
Nature and complexity of information	2.38	0.86
Communication channels used	2.45	0.74
Socioeconomic status	2.38	0.81
Age and generational differences	2.41	0.80
Government policies and institutional influence	2.58	0.88
Perceived effectiveness & trust	2.49	0.61
Peer influence and social networks	2.48	0.51

Accepted Mean =2.0

Table 7. Agricultural information shared with farmers

Agricultural information	*Frequency	Percentage
Crop production information	270	84.4
Livestock management information	260	81.3
Weather and climate information	250	78.1
Pest and disease control	275	85.9
Soil and land management techniques	240	75.0
Market and economic information	265	82.8
Agricultural policies and programs	205	70.3
Technology and innovation	231	72.2
Sustainable and environmental practices	224	70.6
Health and safety information	245	76.5
Indigenous knowledge and cultural practices	218	68.1

*Multiple responses

Language selection also impacts farmer empowerment-their ability to make choices, access resources, and influence policies. Empowerment grows when farmers can use languages they are fluent in, as this increases their confidence, engagement in decision-making, and ability to claim needed services. Approaches that involve farmers through their native languages allow them to express needs, share traditional knowledge, and help design solutions, fostering a stronger sense of control over their farming activities (Chambers, 1994). This is especially critical for disadvantaged groups such as women and small-scale farmers, who are often left out of formal communication systems dominated by foreign languages. An effective strategy involves combining both indigenous and foreign languages to maximize the impact of agricultural outreach. Local languages promote understanding and inclusion at the community level, while foreign languages open doors to scientific knowledge and wider economic networks. By integrating both—through translation, localization, and bilingual extension support-communication can more effectively improve farmers' livelihoods and strengthen their empowerment (Aker, 2011).

Agricultural information shared with farmers

Table 7 showed the types of farm production information shared with farmers for the purposes of increased yield/productivity, income and social economic wellbeing, food security and empowerment. These include crop production information (84.4%), livestock management information (81.3%), pest and disease control (85.9%), market and economic information (82.8%), weather and climate information (78.1%), soil and land management (75.0%), agricultural policies and programs (70.3%), technology and innovation (72.2%), sustainable and environmental practices (70.6%), health and safety information (76.5%), and indigenous knowledge and cultural practices (68.1%). Access to agricultural information is essential for boosting productivity, promoting sustainable practices, and supporting rural development. This information covers a broad spectrum—such as advanced crop varieties, soil care, pest and disease management, weather predictions, market prices, credit options, and post-harvest techniques. Its impact largely depends on how relevant, timely, accurate, and easy to access it is for farmers, especially in remote areas where education and communication infrastructure may be limited (Aker, 2011; Davis and Sulaiman, 2014). A key focus of agricultural information involves production methods. Farmers benefit from practical guidance on preparing land, planting, applying fertilizers, irrigating, and managing pests through integrated approaches.

These insights are commonly shared via extension services, demonstration farms, and farmer field schools. When advice is clear and actionable, farmers are more likely to adopt innovations that increase yields and improve food security (Feder *et al.*, 2010). Climate-related data, including expected rainfall and seasonal outlooks, has also grown in importance, helping farmers adjust their practices in response to changing weather patterns (FAO, 2017).

Equally important is market and economic information. Knowledge about price trends, consumer demand, and value chain opportunities allows farmers to make strategic choices about what and when to grow, reduce losses after harvest, and improve profitability. With better market intelligence, they can negotiate more favorable terms and select the most suitable outlets for their products (Shepherd, 2016). Information on loans, insurance, and government programs further supports their ability to invest in and expand farming operations (Davis and Sulaiman, 2014). The way information is delivered matters significantly. While traditional channels like extension officers, local meetings, and radio remain common-particularly in rural regions-digital technologies are reshaping how knowledge reaches farmers. Mobile phones and online platforms now enable real-time advice and direct contact with experts, expanding both the speed and scope of outreach (Aker, 2011). Yet, obstacles such as weak connectivity, limited digital skills, and language differences can restrict the effectiveness of these modern tools. Even with multiple sources available, challenges persist in ensuring high-quality, usable information. Weak extension systems, generic content not adapted to local conditions, and the use of languages farmers don't fully understand can all reduce comprehension and uptake. Addressing these issues requires involving farmers in the design and delivery of information, ensuring it meets local needs and is presented in understandable ways. Combining traditional knowledge with scientific research can also strengthen the credibility and usefulness of agricultural messaging (FAO, 2017).

Agricultural information and communication strategies

Table 8 presents a variety of information and communication strategies for agricultural development. These include the use of local language (65.6%), participatory communication approaches (51.6%), use of media and technology (59.4%), visual and non-verbal communication (46.9%), Cultural sensitivity in messaging (40.0%), farmer-to-farmer interaction (75.0%), community meetings and field demonstrations (56.3%), digital advisory services and e-exchanges (65.6%), and Satellite/GIS data for precision farming(40%). Agricultural information and

communication strategies play a crucial role in spreading, explaining, and encouraging the uptake of innovations that improve farming productivity and rural well-being. These strategies involve the tools, methods and pathways used to share practical agricultural knowledge with farmers, especially in developing regions where information access is often limited. Well-designed communication ensures that farming information is not just available but also easy to access, understand, and apply for diverse farming communities (Aker, 2011; Davis and Sulaiman, 2014).A central element of these strategies is agricultural extension services, which connect research organizations with farmers. Extension workers help convert scientific findings into actionable advice suited to local conditions. Methods like farmer field schools, on-site demonstrations, and participatory rural assessments have proven effective in supporting learning and active farmer involvement. These interactive approaches enable farmers to see new techniques firsthand, raise concerns, and exchange experiences, increasing the chances they will adopt new practices (Feder *et al.*, 2010; Chambers, 1994).

Table 8. Agricultural information and communication strategies

Information & communication strategies	*Frequency	Percentage
Use of local language in extension services	210	65.6
Participatory communication approaches	163	51.6
Use of media and technology	190	59.4
Visual and non-verbal communication	156	46.9
Cultural sensitivity in messaging	130	40.0
Farmer-to-farmer interaction	240	75.0
Community meetings and field demonstrations	180	56.3
Digital advisory services and e-extension	210	65.6
Satellite/GIS data for precision farming	120	40.0

*Multiple responses

Choosing the right communication channels is equally important. Conventional media-radio, television, and printed materials-remain valuable, particularly in remote areas with poor internet connectivity. Radio, in particular, is cost-effective and reaches broad audiences, including those who cannot read. In recent years, digital tools such as mobile phones, social media, and online advisory systems have greatly improved how quickly and widely agricultural information can be shared. These technologies support instant updates, tailored advice, and access to real-time data on weather and markets (Aker, 2011). The effectiveness of communication also depends on language and cultural context. Delivering information in local languages improves understanding and ensures relevance to community norms and traditions.

Farmers are more likely to accept new ideas when messages are conveyed in familiar terms and reflect local realities. In contrast, using foreign languages without proper adaptation can hinder comprehension and weaken outreach efforts (Ani, 2013). As a result, combining local dialects with official languages in communication plans is seen as an effective way to close knowledge gaps. There is also growing recognition of the value of participatory, farmer-focused approaches.

Involving farmers in shaping, delivering, and assessing communication initiatives helps ensure these efforts meet actual needs and preferences. By integrating traditional knowledge and promoting peer learning, such methods foster greater engagement and long-term adoption of innovations (Chambers, 1994; Davis and Sulaiman, 2014). Despite progress, persistent challenges include weak infrastructure, insufficient extension coverage, low literacy rates, and unequal access to information, especially among women and small-scale farmers. Overcoming these barriers calls for stronger training programs, better rural connectivity, and inclusive policies that prioritize disadvantaged groups. Combining time-tested and modern communication tools can further help bridge gaps and enhance the impact of agricultural outreach.

Table 9. Strategies for improved agricultural communication

Strategy for improvement	Frequency	Percentage
Prioritize indigenous languages in communication	260	81.2
Adoption of traditional communication strategies	245	76.5
Strengthen agricultural extension services	280	87.5
Utilization of local media platforms	270	84.2
Promote participatory communication approaches	250	78.1
Simplify and localize technical content	275	85.9
Enhance gender sensitivity	265	82.8
Leverage ICTs	246	76.8

Strategies for improved agricultural communication

Table 9 shows that agricultural communication could be improved by prioritizing indigenous languages in communication (81.2%), adopting traditional communication strategies (76.5%), strengthening agricultural extension services (87.5%), utilizing local media platforms (84.3%), promoting participatory communication approaches (78.1%), simplifying and localizing technical content (85.4%), enhancing gender sensitivity (82.8%), and leveraging ICTs (76.8%).

Enhancing agricultural communication strategies in Southeast Nigeria is crucial for improving farmers' access to information, encouraging the uptake of innovations, and ultimately boosting agricultural productivity and rural well-being. The region's population is marked by linguistic diversity, varying levels of literacy, and a large number of small-scale farmers, which makes effective communication both vital and complex. As a result, communication approaches must be tailored to local contexts, inclusive, and involve active participation from farming communities (Oko, 2019; Aker, 2011). A key step toward more effective communication is delivering agricultural information in local languages. Since many rural farmers in the region are most comfortable with their native tongues, using indigenous languages improves understanding and helps retain knowledge. Presenting information in familiar languages also helps connect scientific research with traditional farming practices, making it easier for farmers to grasp and apply new techniques (Oko, 2019). Moreover, radio broadcasts and extension messages in local languages have been shown to positively influence behavior and improve farming methods (Yekinni and Owolabi, 2022).

Reinforcing agricultural extension services is another important strategy. Extension workers act as links between research institutions and farmers, turning technical findings into practical advice. However, their impact is often limited by factors such as too few agents per farmer, insufficient funding, and lack of training. Strengthening these services through better training, logistical support, and improved coordination among stakeholders can greatly improve how information is delivered and received (Farmonaut, 2025). In-person interactions, on-site demonstrations, and farmer field schools have also proven effective in helping farmers understand and adopt new practices (Ibrahim, 2024). Incorporating participatory communication methods is equally important. Approaches like group discussions, community gatherings, and peer-to-peer learning foster two-way dialogue and knowledge exchange. These methods allow farmers to share their own experiences, ask questions, and jointly develop solutions, increasing their engagement and likelihood of adopting new techniques. Evidence suggests that participatory communication leads to better decision-making and improved farming outcomes compared to one-way, top-down models (Owolabi and Yekini, 2022). The use of information and communication technologies (ICTs) also holds strong potential for expanding the reach and efficiency of agricultural messaging. Mobile phones, digital platforms, and social media enable timely sharing of information on weather, market prices, and farming techniques. However, in Southeast Nigeria, challenges such as weak network coverage, limited digital skills, and language gaps must be addressed to ensure equitable access. Combining digital tools with traditional channels like radio and community announcements can help broaden inclusion and ensure wider reach.

CONCLUSION

Language is central to how agricultural knowledge is shared and how well farmers in Southeast Nigeria understand and adopt new farming practices. Although English dominates formal communication channels, most rural farmers primarily speak local languages, creating a disconnect that undermines the effectiveness of agricultural extension efforts. This research underscores the importance of developing more inclusive and locally relevant communication strategies by integrating indigenous languages with English. When information is delivered in languages farmers are familiar with, it becomes easier to access and understand, leading to better uptake of innovations and improved farming outcomes. Implementing language-sensitive policies in agricultural outreach can help close existing information gaps, strengthen farmers' capacity, support sustainable farming methods, and foster broader rural development across the region.

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