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# Linguistic Strategies for Communicating Climate Change Information to Farmers in Imo State, Nigeria

**[1]Nwulu, F.N., [2]Onuegwunwoke, C.A., [2]Amadi, G.U., [2]Anuonye, F.D., [2]Nzeakor, N.C., [1]Obinna, V.O., [1]Chukwu, K.U., [1]Okere, M.C., [1]Emeka, D.N., [1]Mbarah, G.O., [1]Agama, C.S., [1]Obasi, S.U., [1]Uchenna Uwakwe., [1]Onyeakazi, J.C., [1]Obialo, P.O.C., [1]Onuoha, E.N., [3]Nweke, L.C and [4]Chikaire, Jonadab Ubochioma**

[1]Directorate of General Studies, Federal University of Technology, Owerri;
[2]Department of English Language and Literature, Alvan Ikoku Federal University of Education, Owerri, Imo State;
[3]Department of English, Faculty of Arts, Chukwuemeka Odumegwu Ojukwu, University, Igbariam, Anambra State;
[4]Department of Agricultural Extension, Federal University of Technology, Owerri, Imo State, Nigeria. Email: akjamin2010@gmail.com

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## Abstract

Effective communication of information concerning climate change is not done anyhow before the farm people. It uses sound deliberate linguistic strategies to reach the rural dwellers. This paper attempts to examine the linguistic strategy in place for the communication of climate change information to farmers. It examines features of climate change, climate change information needs of farmers; perceived benefits of climate change information; linguistic barriers for climate change information communication; and the linguistic strategy for communication. Multi-stage sampling technique was used in random selection of a total of 120 farmers. Data were using questionnaire and oral interview. Data obtained was analyzed using mean, percentages and standard deviation. Results showed that the respondents are aware of the following climate changes; changes in rainfall patterns (94.3%), rising temperature (97.5%), soil degradation (94.1%) and others. They need climate information such as weather and seasonal forecast (9.3%), early morning information (96.6%), market/economic information (99.1%). The benefits of using climate information include; promotion of better farm planning (M=2.48), increase productivity/yield (M=22.5), improved income (M=2.54), among others. The linguistic barriers include; use of complex scientific terminology (M=3.08), lack of translation into local language (M=3.13), low English language proficiency (M=3.17), among other barriers. The linguistic strategy include use of clear and simple language (M=2.41), use of audience centered language (M=2.54), use of metaphors/analogues (M=2.48), storytelling /narrations (M=2.57), framing and reframing languages (M=2.55).

## Introduction

Climate change continues to pose a significant global challenge, with profound impacts on agriculture, rural livelihoods, and food security. The Intergovernmental Panel on Climate Change[1] notes that rising temperatures, shifting rainfall patterns, and more frequent extreme weather are increasingly disrupting agricultural productivity. In Imo State, Nigeria—where farming relies heavily on seasonal rains—smallholder farmers are particularly vulnerable. Many have observed changes such as delayed rainy seasons, increased flooding, and deteriorating soil quality, all of which diminish crop yields and threaten their economic stability[2]. While climate data is available through meteorological services and agricultural extension programs, many farmers struggle to access or interpret it due to language limitations and low levels of formal education. Most information is provided in English, whereas local populations often speak and understand Igbo more readily. Simply distributing information is not enough; it must be communicated clearly and in ways that resonate with farmers' lived experiences. Effective communication needs to be accessible, relevant to local contexts, and rooted in cultural understanding. Approaches like translating content into local dialects, simplifying scientific jargon, incorporating storytelling and metaphors, and using code-switching can enhance understanding and support practical application. Research indicates that language significantly influences how knowledge is absorbed and used, especially in rural agricultural settings[3]. Therefore, adopting suitable linguistic strategies is essential for connecting scientific knowledge with traditional farming practices, enabling farmers in Imo State to better adapt to climate challenges.

This study draws on sociolinguistics—the study of how language reflects social variation, as noted by [4]—to examine the interplay between language and its social context. A growing issue in climate communication is the exclusion of large population groups, often due to complex and unclear terminology. This problem disproportionately affects marginalized and economically disadvantaged communities across Sub-Saharan Africa, including Nigeria. Much of the current climate

dialogue emerges from scientific institutions in high-income countries, where experts, even unintentionally, control access to knowledge. The technical and specialized nature of this discourse creates barriers for African audiences, who must interpret abstract scientific ideas through their own linguistic and cultural frameworks.

As a result, audiences face two main hurdles: translating technical concepts into their native languages and aligning them with local realities. This situation suggests that understanding one's environment may first require interpreting knowledge shaped by Western perspectives—a concern [5]. These dynamics reveal serious shortcomings in current communication approaches, calling for immediate reform. If language becomes an obstacle, efforts to share climate information risk failing. Two key factors increase Africa's vulnerability: limited capacity and willingness to adapt, and the difficulty of accessing climate knowledge due to overly technical language. For communities across Sub-Saharan Africa, especially in Nigeria, engaging with this specialized vocabulary is crucial, as they are central to climate response efforts[5]. Experts and communicators should refrain from imposing technical language on audiences who are either unprepared or unwilling to engage with it. Indigenous populations grasp information most effectively when it is shared in their native languages. Therefore, continuous use of distant or unfamiliar language risks deepening knowledge gaps and weakening vital adaptation and mitigation actions.

**Rationale for the study on Linguistic Strategies for climate information communication**

Effectively conveying climate change information to farmers in Imo State demands careful attention to language and communication methods for several important reasons. A primary challenge is accessibility—many rural farmers have limited formal education and are not fluent in English, making it hard for them to grasp technical scientific terms [6]. Translating climate messages into local languages like Igbo enhances understanding and encourages greater involvement. Just as crucial is ensuring cultural relevance. When information draws on traditional knowledge, familiar sayings, or seasonal observations, it resonates more deeply. For instance, using local proverbs or natural indicators to describe weather changes can improve both comprehension and retention[7,8]. Simplifying

complex concepts such as "adaptation," "mitigation," and "greenhouse gases" into everyday language also helps make the content more concrete and relatable. Trust is another key factor; farmers are more likely to act on advice when it comes through trusted sources—such as extension agents or community leaders—who communicate in ways that feel familiar and respectful[8]. Language use also affects inclusivity. Women and other marginalized groups often face additional barriers in accessing information, so communication that reflects local speech and context promotes fairer access. Ultimately, clear and context-sensitive messaging can drive real changes in behavior, supporting the adoption of climate-smart practices such as planting drought-resistant crops, adjusting sowing times, or improving soil and water management.

Climate change is increasingly disrupting farming across Nigeria, affecting both smallholders and commercial producers through higher temperatures, irregular rains, extreme weather events, and new pest outbreaks. Responding to these threats requires timely, clear, and locally relevant climate information. However, as research indicates, the value of this information depends not just on its accuracy but also on how it is delivered—particularly in linguistically diverse rural areas[9,10]. In countries like Nigeria, scientific findings are often shared in formal or dominant languages that many farming communities do not fully understand. International organizations such as the Food and Agriculture Organization stress that effective outreach must align with farmers' preferred languages, cultural values, and everyday communication practices to support informed choices [11]. Similarly, the Intergovernmental Panel on Climate Change emphasizes that successful adaptation depends on integrating scientific insights with local experiences and traditional understanding[12]. Methods such as using regional dialects, simple narratives, farming-related analogies, group dialogues, and community radio have proven effective in helping farmers interpret climate risks and responses [13,14]. These approaches transform abstract data into messages that reflect farmers' realities and agricultural systems. Therefore, identifying and applying appropriate linguistic strategies is essential for building resilience in agriculture.

**Climate Change in Nigeria**

The prolonged droughts in northern Nigeria and frequent floods in the south illustrate the growing impact of climate change nationwide. Unstable weather patterns and shifting seasons are clear signs of a crisis that can no longer be overlooked. Recent droughts, for example, are not isolated incidents but part of a broader trend. Yet, public discussions about climate change in Nigeria often remain abstract and disconnected from people's lived experiences[4]. While individuals may encounter climate-related information, the technical language used often confuses rather than clarifies its real-world consequences. This gap stems from early portrayals of climate change as a purely scientific issue requiring expert solutions. As a result, communities looked to scientists for answers that either never came or were too complex to apply. The specialized vocabulary common in expert discussions can alienate those without academic backgrounds, leading to misunderstanding and disengagement. Media coverage on the topic is also limited, leaving many poorly informed. Climate change rarely dominates headlines or registers as a pressing public issue. Political discourse tends to focus on historical grievances such as colonialism, diverting attention from urgent environmental concerns. This leaves the public seeking clarity but finding little guidance, while decision-makers themselves often lack adequate knowledge or preparedness.

For Nigerians to respond effectively to climate change, they must first recognize how it directly affects their lives. People observe changes—floods, heatwaves, unpredictable rains—but often fail to connect these events to larger climatic shifts. In rural areas, farmers and participants in development programs hold rich traditional knowledge about their environment, yet feel excluded by unfamiliar scientific jargon. The media has a vital role in bridging this gap by linking local environmental events to climate change in ways that are accessible and meaningful. Given the urgency and complexity of the issue, numerous studies in Nigeria have called for clearer, more inclusive communication strategies. Delivering information in local languages is essential for enabling these communities to apply knowledge in areas like adaptation, mitigation, and sustainable development. For example, farmers need weather forecasts in their native language to interpret trends and plan farming activities. Likewise, rural participants in conservation efforts require

clear, accessible information to contribute meaningfully to environmental protection.

Discussions about climate change often rely on metaphors that evoke fear, urgency, or alarm, along with hedging expressions, complex phrasing, and ideological framing. As Eubanks[15] observes, drawing on Aristotle, a metaphor operates across two domains—the original concept and its new application. From this perspective, a metaphor's effectiveness depends on Levinson's notion of situational context, which must align in both settings [16]. This becomes especially significant when scientific metaphors, though acceptable in academic circles, appear confusing or intimidating to general audiences, particularly in Sub-Saharan Africa. In these regions, local and indigenous languages play a central role in daily life and environmental awareness, fostering deeper, more intuitive connections to nature.

**Problem Statement**

Despite growing access to climate information services, many farmers continue to struggle with accessing, understanding, and applying climate data in their farming decisions. Existing communication approaches often rely on technical language, formal formats, and top-down delivery systems that don't align with farmers' everyday speech, cultural contexts, or local knowledge systems. In multilingual regions, information is typically shared in official or national languages, leaving behind those who speak only regional dialects. Moreover, climate messages are commonly framed using abstract scientific concepts—such as probability-based forecasts or generalized impact assessments—making it difficult for farmers to translate them into practical choices about when to plant, what crops to grow, or how to manage water resources. This mismatch undermines trust, reduces the usefulness of the information, and limits its real-world application. While governments and development organizations increasingly promote climate-smart agriculture and better climate services, they frequently neglect how language affects whether farmers receive, understand, and act on this information. The World Bank has pointed out that poor communication and limited user involvement remain major barriers for smallholder farmers trying to benefit from climate services. As a result, a persistent gap exists between the climate knowledge available and the way it is linguistically conveyed. This study addresses that gap by focusing on the lack of context-sensitive

language strategies in sharing climate information. Investigating these strategies is crucial for improving agricultural adaptation, safeguarding rural livelihoods, and increasing food production under shifting climate conditions. When climate information is shared in familiar, trusted languages and formats, it supports deeper learning, encourages collective problem-solving, and strengthens farmers' ability to respond to climate risks.

Language functions as a key tool in development communication. Approaches that involve local communities—such as storytelling, proverbs, analogies, community dialogues, and radio programs in native languages—can bridge scientific findings with traditional farming knowledge (Vaughan & Rogers, 2000). Identifying effective linguistic methods enables extension workers, media professionals, and policymakers to design more inclusive outreach efforts that reach marginalized groups, including women, elderly farmers, and those with limited literacy, who are often excluded by standard communication channels. Strengthening language use in climate messaging also supports global goals that emphasize user-focused services and community-led adaptation. As noted by the FAO [17] and IPCC [12], climate communication must be adapted to users' specific needs, contexts, and capacities. Therefore, this study contributes to both research and practice by providing evidence-based insights on how strategic language use can improve farmers' access to climate information, enhance decision-making, and build resilience in agriculture. In Nigeria, where climate change severely threatens rural livelihoods, public awareness and action remain low. Many people do not fully recognize the urgency of the issue, resulting in limited engagement with adaptation or mitigation efforts. A major reason for this disconnect lies in how climate change is communicated. The language and framing used by the media, government agencies, and environmental groups significantly influence public understanding and response. Clear, accessible communication is vital for raising awareness and encouraging informed action. Well-chosen language can clarify complex issues, while poorly designed messaging can cause confusion and disengagement[17,12]

Using local languages could greatly improve outreach, especially in rural areas where most Nigerians live and where indigenous languages dominate daily communication.

Delivering climate messages in these languages can enhance comprehension and encourage broader participation. Similarly, in Nigeria, adopting local languages in climate communication could yield comparable benefits. Additionally, climate change itself poses a threat to linguistic diversity. Vulnerable communities, particularly in coastal or island regions, may be displaced due to environmental changes, putting their native languages at risk. UNESCO, estimates that only about half of the world's 7,000 languages will survive the century, with climate pressures accelerating language loss as displaced populations assimilate into new environments[18].

Earlier studies have underscored the importance of language in shaping climate change understanding and action. Using local languages in environmental campaigns increases engagement and understanding, particularly in rural settings. Despite these clear truths, there has been no research conducted in Imo State, making this study essential. This paper aims to examine how language strategically influences climate change awareness, understanding, and action in Imo State, Nigeria. It also seeks to emphasize the importance of developing effective communication frameworks that benefit policymakers and environmental advocates by exploring the connections between language, culture, and environmental awareness.

## Materials and Methods

The research is centered in Imo State, situated in the Southeastern part of Nigeria. This region is primarily focused on agriculture, with many rural inhabitants engaged in crop farming, small-scale livestock rearing, and mixed farming practices. The main agricultural zones encompass Owerri, Orlu, and Okigwe, each reflecting a variety of ecological and cultural characteristics. In Imo State, the Igbo language is widely spoken alongside English, which serves as the official language for government, education, and agricultural extension services. Currently, the area faces several climate-related challenges, including erratic rainfall, flooding, soil erosion, and diminishing soil fertility, all of which significantly impact agricultural productivity and the livelihoods of its people. Given the linguistic variety and differing literacy levels among farmers, selecting the appropriate language and communication strategies is vital for effectively sharing climate change-related information [3,12]. This study utilizes a

descriptive survey research design, ideal for exploring current linguistic practices, favored communication channels, and farmers' views on climate change information. By combining both quantitative and qualitative methodologies, the research aims to capture measurable trends while also providing a deeper understanding of farmers' communication needs. This mixed-methods approach allows for an investigation into how language choice, message framing, and media platforms affect farmers' comprehension and application of climate change information [3]. The target population includes both registered and non-registered crop and livestock farmers from rural areas across the three agricultural zones of Imo State. A multistage sampling technique is employed: initially, one local government area is randomly selected from each agricultural zone. Next, two farming communities are intentionally chosen from each selected local government area based on the level of farming activity. Finally, farmers are randomly selected from farmers' associations and community registers, resulting in a total sample of 120 farmers (with 60 from each agricultural zone). This sample size is deemed sufficient to reflect the linguistic and communication diversity among farmers in the state. Data collection is executed through three primary instruments: a structured questionnaire to gather information on the languages farmers use to receive climate change information, and focus group discussions that delve into how local expressions, metaphors, and storytelling contribute to understanding climate change experiences. Utilizing these varied data sources enhances both the reliability and validity of the findings [12]. Quantitative data collected from questionnaires are analyzed through descriptive statistics, including frequencies, percentages, and average scores. The findings are displayed in tables and charts for clarity. On the other hand, qualitative data derived from interviews and focus group discussions undergo thematic analysis, with themes centered around language preference, message clarity, cultural relevance of communication, and perceived barriers in understanding climate change information. By integrating both quantitative and qualitative findings, we enhance the robustness of our results through triangulation[3].

## Results and Discussion

### Awareness of Climate Change Signals by Farmers.

Table 1 shows that the respondents are highly aware of climate change signals as observed through several environmental and agricultural indicators. The majority reported awareness of changing rainfall patterns (98.3%) and rising temperatures (97.5%). A large proportion also recognized the increasing frequency of extreme weather events (95.0%) and noticeable shifts in crop performance (91.6%).Respondents further identified changes in the nature of pests and diseases (83.3%), soil degradation (94.1%), and changes in water availability (96.6%). Many also observed frequent deaths of farm animals (83.3%) and changes in flowering and fruiting periods of crops and trees (95.8%).In addition, farmers reported the disappearance of traditional weather indicators (92.5%) and the extinction of certain plants and insects (93.3%). Examples of disappearing traditional indicators include certain insects, frogs, birds, and flowering trees that were previously used to predict weather conditions. Farmers' understanding of climate change is essential for recognizing shifts in weather patterns, long-term changes in temperature and rainfall, and how these affect crops, livestock, and their overall livelihoods. Climate change has become a global concern with profound effects on agriculture—an industry highly sensitive to climatic risks and central to food security [12]. In developing agricultural economies such as Nigeria, improving farmers' awareness is key to strengthening adaptation efforts, increasing productivity, and reducing vulnerability in rural areas. According to the Food and Agriculture Organization (FAO)[19,20], small-scale farmers are particularly at risk due to their dependence on rain-fed farming and natural ecosystems [21,22,20]. Being aware of climate change helps farmers detect anomalies like delayed rains, prolonged droughts, floods, higher temperatures, and increased pest and disease outbreaks. Studies show that when farmers understand both the phenomenon and its causes, they are more likely to implement adaptive practices—such as crop diversification, earlier planting, using drought-tolerant varieties, improving soil and water conservation, and refining livestock management [23]. The IPCC notes that agricultural output is already declining in many tropical and subtropical regions due to heat stress, erratic rainfall, and extreme weather events [12]. For farmers, awareness means not only noticing climate shifts but also understanding their consequences for yields, income, food access, and household stability. Higher awareness supports better planning, risk management, and engagement

with agricultural extension services and climate information systems.

In rural communities, access to reliable information significantly shapes farmers' level of awareness. Agricultural extension agents, radio broadcasts, community media, mobile technology, farmer groups, and NGOs all play important roles in disseminating climate-related knowledge [24,25,26]. The International Fund for Agricultural Development (IFAD) emphasizes that climate information tailored to local conditions and presented in clear, accessible ways builds trust in scientific forecasts and supports timely decisions . When communication occurs in local languages and involves participatory approaches, farmers are better able to identify risks and respond effectively. Yet, multiple barriers limit awareness. Low levels of formal education, poor access to extension support, weak infrastructure, unreliable weather monitoring systems, and poverty all restrict farmers' exposure to accurate climate information [27]. In many areas, climate change is interpreted solely through personal experiences with extreme weather, without a broader grasp of long-term trends or human contributions. This limited view often leads to short-term, reactive responses rather than strategic, forward-looking adaptations. The World Bank stresses that raising awareness is vital for promoting climate-smart agriculture and sustainable rural development [23]. Increased understanding can encourage farmers to adopt new technologies, join climate insurance schemes, and participate in collective natural resource management. In countries like Nigeria, where agriculture supports both food security and employment, improving climate literacy among farmers is critical for building resilient food systems and reducing rural poverty. Ultimately, farmer awareness is a cornerstone of effective adaptation. Policies that expand extension services, support climate education, strengthen rural communication networks, and integrate local knowledge with scientific data can significantly improve farmers' ability to cope with present and future climate challenges.

**Table 1: Awareness of Climate Change Signals by Farmers**

| Climate Change Signals | Frequency | Percentage |
|---|---|---|
| Changing rainfall patterns | 118 | 98.3 |

| | | |
|---|---|---|
| Rising temperatures | 117 | 97.5 |
| Increasing frequency of extreme events | 114 | 95.0 |
| Shifts in crop performance | 110 | 91.6 |
| Changing nature of pests and diseases | 100 | 83.3 |
| Soil degradation | 113 | 94.1 |
| Changes in water availability | 116 | 96.6 |
| Frequent death of farm animals | 100 | 83.3 |
| Changes in flowering and fruiting time | 115 | 95.8 |
| Disappearance of traditional weather indicators | 111 | 92.5 |
| Extinction of certain plants and insects | 112 | 93.3 |

***Multiple responses.**

**Climate Change Information Needs of Farmers**

Table 2 shows the types of climate change information needed by the farmers. This information is necessary for adaptation and mitigation practices, such as soil conservation and water management in the field. The needed information includes: weather and seasonal forecasts (98.3%), early warning information (96.6%), climate-smart farming practices (95.0%), water management information (84.1%), soil and land management guidance (90.0%), pest and disease control information (94.1%), heat stress management for livestock (86.6%), water and food security for livestock (84.1%), market and economic information (99.1%), and local/indigenous knowledge (97.5%). Small-scale farmers in developing countries like Nigeria are especially at risk from climate change, and their ability to adapt hinges largely on access to clear, timely, and relevant climate information. This includes data, knowledge, and advisory services that support informed decisions about crops, livelihoods, and managing climate-related risks. Seasonal and short-term forecasts—such as those predicting rainfall patterns, dry spells, or extreme weather—are essential tools. They allow farmers to plan planting, fertilizer application, and harvesting more effectively, helping minimize losses caused by unpredictable weather. According to the FAO, reliable climate and agrometeorological information is key to promoting climate-smart agriculture and sustainable food systems [20]. Complementing this, training in resilient farming practices—like using drought- or flood-tolerant seeds, conserving soil and water, and adjusting livestock management—is equally vital.

The IPCC emphasizes that successful agricultural adaptation must be tailored to local conditions and supported by localized data and extension services that translate scientific findings into practical actions [21]. Early warning systems for climate-related disasters also play a critical role. Accurate, location-specific alerts about floods, heatwaves, pests, or storms enable farmers to take preventive steps—such as harvesting early, moving livestock, or changing sowing dates. The World Bank highlights that combining climate information services with early warning systems can significantly reduce vulnerability and safeguard rural incomes [25]. Beyond weather, farmers also need insights into how climate change affects markets and economic opportunities, including price fluctuations, storage challenges, and alternative sources of income. Climate-induced disruptions often destabilize markets, so understanding both environmental and economic trends is crucial when making production and investment choices. Awareness of financial support options—such as climate-linked loans, subsidies, index-based insurance, and government adaptation programs—is also essential. Yet many smallholders remain unaware of these resources. IFAD warns that this knowledge gap severely limits their ability to strengthen resilience [27].

For climate information to be effective, it must be shared clearly, in local languages, and through trusted channels like extension agents, community radio, and farmer networks. Research by CGIAR indicates that advisories are more effective when they reflect local realities, consider gender differences, and involve farmers in their design [28]. In Nigeria, where agriculture depends heavily on rainfall and literacy levels vary, farmers need more than technical forecasts—they need straightforward, actionable guidance on when to plant, what crops to grow, how to manage soil, and how to use water efficiently. Given your focus on education and learning, this underscores the importance of clear communication and accessible language in equipping farmers to respond effectively to a changing climate.

**Table 2: Climate Change Information Needs of Farmers**

| Climate Change | Information | Frequency | Percentage |
|---|---|---|---|

| | | |
|---|---|---|
| Weather and Seasonal Forecasts | 118 | 98.3 |
| Early Warning Information | 116 | 96.6 |
| Climate-Smart Farming Practices | 114 | 95.0 |
| Water Management Information | 107 | 84.1 |
| Soil and Land Management Guidance | 108 | 90.0 |
| Pest/Disease Control Information | 113 | 94.1 |
| Heat Stress Management for Livestock | 104 | 86.6 |
| Water and Food Security for Livestock | 101 | 84.1 |
| Market and Economic Information | 119 | 99.1 |
| Local and Indigenous Knowledge | 117 | 97.5 |

***Multiple responses**

**Benefits of climate change information Needs**

Table 3 shows that farmers benefit when they receive climate information. The following benefits were identified: promotes better farm planning (M=2.48), reduction of crop and livestock losses (M=2.50), increased productivity and yields (M=2.53), improved food security (M=2.36), cost savings in production (M=2.41), promotion of better risk management (M=2.49), improved income and livelihoods (M=2.54), stronger adaptation to climate change (M=2.43), improved decision-making confidence (M=2.38), promotion of environmental sustainability (M=2.37), and building resilience for adaptation (M=2.33).

Knowing what weather might come helps farmers plan work on the land. Because they see long-term patterns, timing for sowing shifts based on expected conditions. Plant types get picked not by habit but by forecasted heat or dry spells. When rain seems likely to arrive late, adjustments happen - like switching to faster-growing plants. Decisions tie directly to data, cutting guesswork from daily routines. Less seed gets used without purpose, fertilizer spreads only where needed. Work teams organize earlier, avoiding delays once tasks begin. Choices reflect real changes seen over recent years rather than old habits. Evidence shapes each move instead of tradition guiding every step. Outcomes improve simply because plans follow signals from nature itself. Farmers using weather forecasts often align planting times more closely with actual seasonal shifts, according to [19]. Because climate trends help anticipate problems, staying informed reduces the chance of crop failure.

Climate-related risks are intensifying—droughts are becoming more severe, heavy rains more frequent, and seasonal patterns increasingly unpredictable. Early weather warnings give farmers valuable options: they can adjust planting schedules, improve drainage systems, or move livestock before extreme heat hits [12]. Small-scale farms are especially vulnerable, often lacking financial reserves to recover from crop losses. Access to timely forecasts enables growers to respond proactively, reducing harm when severe weather strikes [29,30]. As climate variability becomes more common, understanding long-term weather trends is increasingly vital for agricultural planning. Detailed knowledge of ongoing changes supports more informed decisions about land use and crop management. Farmers observing gradual warming, erratic rainfall, or stronger storms often adapt by adopting hardier seed varieties, improving soil protection, integrating trees into fields, or setting up rainwater harvesting systems. These experiences encourage diversifying crops, rotating what is grown, or combining crop production with livestock.

Studies show that weather risk advice is most effective when paired with practical, locally grounded support from agricultural advisors. This combination encourages more farmers to adopt innovative tools designed for climate resilience. Using climate information helps stabilize yields. Insights into weather patterns support better decisions on irrigation, nutrient application, and pest control, minimizing preventable losses [31]. When shifts in temperature and moisture are detected early, threats such as pests or plant diseases can be identified sooner. This allows for well-timed pesticide use, selection of resistant crop varieties, or implementation of integrated pest management before problems escalate. Over time, these adjustments contribute to more consistent harvests, even amid unpredictable weather [31]. Since farming sustains both food security and rural livelihoods, stability in production is crucial. Timely warnings help farmers adapt under pressure, maintaining output during crises. This resilience becomes evident when storms occur—fields continue producing, and communities recover faster. Awareness of potential climate risks allows farmers to prepare and act at the right moment [31]. Weather updates help them anticipate changes over seasons or years, while also suggesting practical ways to respond, increasing their sense of readiness. Work by the World Meteorological Organization confirms that

delivering climate information through farm advisory services improves farmers' ability to cope with extreme weather and shifting conditions [31]. Climate insights also contribute to more stable incomes. With reliable forecasts, farmers can avoid costly losses like failed crops or animal deaths, leading to more dependable harvests and less income fluctuation. When climate data informs planting decisions, farming aligns more closely with market demand. By considering typical growing cycles, farmers can time harvests to coincide with peak market activity. This improves sales decisions, boosts household earnings, and strengthens economic stability in rural area[29].

Weather records support smarter use of land and water. Awareness of trends in rainfall, temperature, and dry periods helps farmers manage water more efficiently. This knowledge is especially critical in areas facing water scarcity or irregular storm patterns . When forecasts indicate changes, planting dates may shift, and practices like drip irrigation or runoff collection become more appealing. Field actions increasingly follow from sky-based observations. Thoughtful decisions ease pressure on limited water supplies and promote sustainable farming. As weather data improves outreach, training for farmers becomes more targeted. With accurate forecasts and practical tools, agricultural advisors can offer more precise guidance. This strengthens trust in advisory services and increases program effectiveness through stronger local relationships [30].

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**Table 3: Benefits of Climate Change Information to Farmers**

| Perceived Benefit | Mean | SD |
|---|---|---|
| Promotes better farm planning | 2.48 | 0.45 |
| Reduction of crop/livestock losses | 2.50 | 0.55 |
| Increase in productivity and yields | 2.53 | 0.58 |
| Improves food security | 2.36 | 0.40 |
| Saves cost of production | 2.41 | 0.48 |
| Promotes better risk management | 2.49 | 0.64 |
| Improves income and livelihoods | 2.54 | 0.74 |
| Stronger adaptation to climate change | 2.43 | 0.71 |
| Improves decision-making confidence | 2.38 | 0.51 |
| Promotes environmental sustainability | 2.37 | 0.49 |
| Builds resilience for adaptation | 2.33 | 0.58 |

**Average Mean = 2.0**

## Linguistic Barriers Affecting Climate Change Communication

Effective communication regarding climate change among farmers, particularly in rural Imo State, Nigeria, faces significant challenges due to various linguistic issues. These challenges hinder understanding, adoption of climate-smart practices, and overall responsiveness to changes in the environment. Table 4 showed that all ten identified linguistic barriers surpass the critical threshold of 2.50, indicating they are significant impediments to effectively sharing climate change information with farmers in Imo State. In particular, low proficiency in English (M = 3.17) and a heavy reliance on written communication (M = 3.15) were the most pronounced, pointing to the difficulties farmers face in understanding English written materials. This aligns with Aker's (2011) findings that language obstacles considerably restrict access to agricultural information in developing regions. Furthermore, the lack of translations into the indigenous Igbo language (M = 3.13) and misinterpretations arising from poor translations (M = 3.11) underscore the need for precise and culturally sensitive translations. This supports Nyong et al.[32], who argue that using local languages enhances understanding and adaptation to climate change. Other barriers, such as the use of complex scientific terms (M = 3.08), inadequate simplification of concepts (M = 3.10), and ambiguous messaging (M = 3.00), highlight the difficulties posed by the technicality of climate-related information for rural farmers. The above means that it is good to simplify language and develop clear communication strategies for effective knowledge transfer. Moreover, the lack of culturally relevant communication methods and ineffective local expressions suggest that current communication practices often fail to reflect the socio-cultural realities of farmers. As noted by Rogers[8], communication is most effective when it resonates with the audience's linguistic and cultural context. Overall, these findings reveal that linguistic barriers are significant obstacles to disseminating and utilizing

climate change information among farmers. Addressing these barriers through tailored linguistic strategies is essential for improving comprehension, enhancing adaptive capacity, and encouraging sustainable agricultural practices.

Researchers highlight the crucial role language plays in spreading knowledge, especially in multilingual and low-literacy environments [33, 34]. Some of the prevalent linguistic challenges include the use of technical language, limited English literacy, absence of translations into local languages, unclear messaging, and insufficient culturally relevant communication methods. Such obstacles diminish the impact of extension services and climate awareness initiatives [35].

**Table 4: Linguistic Barriers for Communicating Climate Change Information**

| Linguistic Barriers | Mean | SD |
|---|---|---|
| Use of complex scientific terminology | 3.08 | 0.67 |
| Lack of translation into local language (Igbo) | 3.13 | 0.57 |
| Low English language proficiency among farmers | 3.17 | 0.72 |
| Ambiguity in climate-related messages | 3.00 | 0.82 |
| Poor simplification of technical concepts | 3.10 | 0.77 |
| Ineffective use of local expressions and idioms | 3.07 | 0.62 |
| Lack of culturally relevant communication styles | 3.04 | 0.84 |
| Inadequate use of visual and oral communication aids | 3.06 | 0.69 |
| Misinterpretation due to poor translation | 3.11 | 0.56 |
| Over-reliance on written communication | 3.15 | 0.71 |
| | | 0.62 |

**Acceptance Mean = 2.0**

**Linguistic Strategies for Communicating Climate Change Information**

With a discrimination mean index of 2.0, table 5, showed the following linguistic strategies for communicating climate change information to farmers; use of clear and simple language (M=2.41), use of audience-centred language (M=2.52), framing and reframing of language (M=2.35), use of metaphors and analogies (M=2.48),· use of positive and solution-focused language (M=2.54), use of narratives and storytelling (M=2.28), repetition and emphasis (M=2.31), use of inclusive and collective language (M=2.35), use of clear call-to-action language (M=2.41). Consider how climate discussions have evolved. Terms that once seemed neutral now carry

emotional baggage, making it more important than ever to present climate action in a constructive light. The way we frame choices—through language—shapes decisions in subtle but powerful ways. Communicate with clarity and hope, and progress becomes more achievable. This may be the moment to reframe climate change not as a crisis we're enduring, but as an opening—an opportunity. Traditional narratives of battle, war on emissions, or fighting fossil fuels often make the issue feel insurmountable, something happening to us rather than something we can shape. That mindset breeds helplessness. A different story could inspire: one where this challenge drives innovation and invites new thinking. When we focus on building what comes next, possibility emerges.

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Appeals rooted in care—responsibility for future generations, protecting communities, stewardship of nature—resonate more deeply than dry statements [9]. A more effective approach balances concern with actionable steps [34]. Equally important is using inclusive language—"we," "our." It fosters a sense of shared purpose. Unity grows subtly through word choice. Effective climate communication starts by acknowledging what people already know. Since culture shapes understanding, messages land better when they reflect daily life. Policymakers may need depth, students benefit from simplicity, farmers respond to land-based language, and city dwellers may relate to metaphors about pace and routine. Tailoring language to a group's experience builds recognition, not resistance [34].

In classrooms, teachers use diagrams or group discussions. Outside them, people engage more with stories, sayings, or dialogue. Changing how ideas are shared helps them stick, rather than drift away. As digital noise grows—from phones, websites, broadcasts—there's greater need to rethink climate conversations. On TV or radio, brevity wins; clarity wins more. Messages must land quickly, feel authentic, and avoid pressure. How they're shaped now determines what's remembered later. In short formats like headlines or summaries, clear language is essential—truth stays central, but emotion helps it connect [38]. Sometimes dialogue works better than monologue: real questions, live conversation, and local radio discussions keep attention longer.

As Nisbet [33] observed, framing influences which aspects of an issue stand out. Climate discussions gain traction when linked to daily life—health, food security, job stability—rather than distant temperature targets. For those who farm, talking about hotter seasons in terms of failed crops, dry wells, or lost income grabs attention fast. Using familiar comparisons and everyday language makes the message immediate. Describing a heat-trapping layer around Earth feels clearer than citing gas concentrations. So does saying the planet runs a fever, like a sick body. Slow systemic shifts seem abstract—until someone describes rains that no longer come on time. When farmers describe flooded fields in plain terms, numbers become lived experience. Stories endure because they evoke feeling, aiding memory—especially for those still developing literacy [33]. Young audiences often engage more when climate themes are presented as narratives, not warnings. Using familiar language opens doors; complex ideas become clearer when spoken in a listener's own tongue. Valuing linguistic diversity isn't just equitable—it keeps knowledge moving across communities [19]. In Nigerian farming or coastal villages, mixing local dialects with English helps people grasp changing weather. When forecasts come in familiar speech, understanding follows faster. Warnings in one's mother tongue? They stick. Trust grows when alerts sound like home. Messages in native language feel more authentic. Culture lives in those words, creating space for belief. Research confirms the quiet power of linguistic closeness.

**Table 5: Linguistic Strategies for Communicating Climate Change Information**

| Strategy | Mean | SD |
|---|---|---|
| Use of clear and simple language | 2.41 | 0.57 |
| Use of audience-centred language | 2.52 | 0.48 |
| Framing and reframing of language | 2.35 | 0.54 |
| Use of metaphors and analogies | 2.48 | 0.61 |
| Use of positive and solution-focused language | 2.54 | 0.81 |
| Use of narratives and storytelling | 2.57 | 0.48 |
| Repetition and emphasis | 2.28 | 0.62 |
| Use of inclusive and collective language | 2.31 | 0.54 |
| Multi-language communication for all culture | 2.35 | 0.58 |
| Clear call-to-action language | 2.41 | 0.65 |

**Acceptance Mean = 2.0**

## Conclusion

The study highlights that using the right linguistic strategies is vital for effectively communicating climate change information to farmers in Imo State. Incorporating local languages, particularly Igbo, along with simplified English greatly enhances understanding, builds trust, and makes climate change messages more relevant. Engaging approaches like community meetings, radio discussions, and storytelling not only foster greater participation but also aid farmers in interpreting climate information. The results show that climate change communication is most successful when messages are culturally relevant, easy to understand, and shared through trusted local channels. To improve climate change adaptation and mitigation practices among farmers in the state, it's essential to strengthen the bilingual communication skills of extension officers and develop climate information materials that are adapted to local contexts.

## References


1. Intergovernmental Panel on Climate Change. (2021). *Climate Change 2021: The Physical Science Basis*. Cambridge: Cambridge University Press.
2. Nigerian Meteorological Agency (NIMET). (2020). *Seasonal Rainfall Prediction*. Abuja: NIMET
3. Food and Agriculture Organization (FAO). (2017). *Communication for rural development: Sourcebook*. Rome: FAO.
4. Makwanya, P., (2013) An Analysis of the Language Used to Communicate Information on Climate Change. OSR Journal of Humanities and Social Science (IOSR-JHSS) Volume 17, Issue 2 (Nov. - Dec. 2013), PP 17-25
5. Chivaura V.G. and C. G. Mararike, C.G 1998 The Human Factor Approach to Development in Africa. University of Zimbabwe, Harare Zimbabwe
6. Aker, J. C. (2011). Dial "A" for agriculture: Using information and communication technologies for agricultural extension in developing countries. *Agricultural Economics*, 42(6), 631–647
7. Nyong, A., Adesina, F., & Osman Elasha, B. (2007). The value of indigenous knowledge in climate change mitigation and adaptation strategies in the African Sahel. *Mitigation and Adaptation Strategies for Global Change*, 12(5), 787–797.
8. Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). New York: Free Press.

9. Moser, S. C. (2010). Communicating climate change: History, challenges, process and future directions. *WIREs Climate Change*, 1(1), 31–53
10. Vaughan, P. W., & Rogers, E. M. (2000). A staged model of communication effects. *Journal of Health Communication*, 5(3), 225–249
11. FAO (2019a). *Digital technologies in agriculture and rural areas*. Food and Agriculture Organization of the United Nations, Rome.
12. IPCC (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.
13. Nyantakyi-Frimpong, H., & Bezner-Kerr, R. (2015). The relative importance of climate change in the context of multiple stressors in semi-arid Ghana. *Global Environmental Change*, 32, 40–56.
14. Moser, S. C. (2016). Reflections on climate change communication research and practice in the second decade of the 21st century. *WIREs Climate Change*, 7(3), 345–369
15. Eubanks (1999 P. Eubanks. Written Communication. Sage Publications 16 (2), 1992, 18-32
16. Levinson's (1983) B. Levinson. Pragmatics (Cambridge University Press, Cambridge, 1983).
17. UNESCO. (2017). *Education for sustainable development goals: Learning objectives*. Paris: UNESCO
18. FAO. (2019). *Climate services for agriculture and food security*. Food and Agriculture Organization of the United Nations.
19. Food and Agriculture Organization (FAO). (2021). *Communicating climate change for rural development: A guide for extension workers*. FAO
20. FAO (2022). *Climate-smart agriculture and climate information services*. Rome: Food and Agriculture Organization of the United Nations.
21. FAO (2022). *The State of Food and Agriculture 2022: Leveraging automation in agriculture for transforming agrifood systems*. Rome: Food and Agriculture Organization of the United Nations
22. World Bank. (2021). *Climate services and information for resilient agriculture*. World Bank Group.
23. World Bank (2021). *Weathering the Storm: Managing climate risks in agriculture*. World Bank Group, Washington, DC.
24. World Bank (2021). *Climate-Smart Agriculture Investment Plan and Rural Livelihoods Resilience*. Washington, DC: World Bank.
25. World Bank (2021). *Climate risk and adaptation country profiles and climate information services*. Washington, DC: World Bank.
26. IFAD (2021). *Rural development report 2021: Building inclusive rural*

*futures*. Rome: International Fund for Agricultural Development
27. CGIAR (2020). *Climate information services for agriculture: Practices and policy perspectives*. CGIAR Research Program on Climate Change, Agriculture and Food Security.
28. FAO (2018). *Climate services for agriculture and food security*. Food and Agriculture Organization of the United Nations, Rome
29. Hansen, J. W., Mason, S. J., Sun, L., & Tall, A. (2011). Review of seasonal climate forecasting for agriculture in sub-Saharan Africa. *Experimental Agriculture*, 47(2), 205–240
30. WMO (2019). *Climate services for agriculture: Building resilience to climate variability and change*. World Meteorological Organization, Geneva.
31. Ajayi, O. C. (2019). *Language barriers and agricultural information dissemination in rural Nigeria*. Journal of Agricultural Extension, 23(2), 45–56.
32. Odebode, S. O. (2020). Communication strategies and barriers in agricultural information dissemination. *International Journal of Agricultural Communication*, 12(4), 112–125
33. Nisbet, M. C. (2009). Communicating climate change: Why frames matter for public engagement. *Environment*, 51(2), 12–23.
34. Corner, A., Shaw, C., & Clarke, J. (2018). *Principles for effective communication and public engagement on climate change*. Oxford: Climate Outreach
35. Dahlstrom, M. F. (2014). Using narratives and storytelling to communicate science with non-expert audiences. *Proceedings of the National Academy of Sciences*, 111(Suppl. 4), 13614–13620.